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ABBREVIATED HISTORY OF THE ASSOCIATION OF VIETNAM NEUROLOGY (1962-2018)

Le Duc Hinh*, Nguyen Chuong**

ABSTRACT

This article clearly delineates major episodes of the Vietnam Association of Neurology development. On the basis of activities carried out by the Bachmai hospital Neuro-psychiatric

Clinical department and of the Chair of Neuro-psychiatry of the Hanoi Faculty of Medicine and Pharmacy of Hanoi since 1956, with the collaboration between the Vietnam military and non military Neurology, Psychiatry, and Neuro-Surgery-On September 3rd 1962, was founded the Assoxciation of Vietnam Neurology, Psychiatry, and Neuro-Surgery. After the country's reunification, on the needs of development and the realities those three specialities were being faced, the Association was dissolved by the Government, and three independent societies were fouded. Thus, the Vietnam Association was created May 20th 1998. It registers 350 active members in six Vietnam Societies of Neurology. The Vietnam Association of Neurology (VAN) is member of the South-East- Asia Association of Neurology (SEAAN), and of the Association of Neurology of Asia and Oceania (ANAO) and of the World Federation of Neurology (WFN).

ABSTRAIT

Avant 1954, il n' existait pratiquement pas de Neurologie au Vietnam. Dans les hôpitaux sous l' ancien régime à Hà Nội, Huế et Sài Gòn les malades étaient traités dans les services de médecine générale ou des maladies contagieuses et les enfants dans les cliniques de pédiatrie tandis que les malades mentaux étaient gardés dans quelques camps spéciaux comme à Bắc Giang, Biên Hòa… Particulièrement à l' Hôpital (Cống Vọng) de Bạch Mai, même après la restauration en 1939, il existait un service des Aliénés et Prisonniers mais à la porte d'entrée dans ce lieu était inscrit "Département de Neurologie" ! 'En fait, ce n'était pas ni département ni neurologie mais un camp pour les aliénés et les prisonniers malades. Dans l'ancien temps, Neurologie et Psychiatrie n'étaitent pas enseignées à l'Université Indochinoise de Hanoi.

I. APPARITION DE LA NEUROLOGIE

L'histoire de la Neurologie du Vietnam ne débutait qu'après la libération totale du Nord Vietnam en Octobre 1954. Sur Décision du Ministère de la Santé de la République Démocratique du Vietnam le 2 Décembre 1956, la première Clinique Neuro-Psychiatrique fut établie à l'Hôpital de Bạch Mai en conjonction avec la création đe la Chaire de Neuro-Psychiatrie à la Faculté de Médecine et de Pharmacie à Hanoi. Dr. Nguyễn Quốc Ánh, spécialiste en neuro-psychiatrie et ancien Chef de clinique à la Faculté de Médecine de Paris, de retour au Vietnam après avoir vécu plusieurs années en France, était confié la double responsabilité de dirigeant hospitalier-universitare. La Clinique était à la fois le siège d'application de la Chaire et jouait pour ainsi dire le rôle de chef de file en neuro-psychiatrie. Dès lors, un programme d'enseignement de neurologie et de psychiatrie entièrement en Vietnamien avec l'application des méthodes et techniques nouvelles dans la pratique hospitalière de ce

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jour avaient bâti un fondement solide pour la double spécialité dans le cadre de la médecine au Vietnam.

D'autre part, l'étape de 1956 jusqu'à 1960 était aussi marquée par la fondation de la Clinique neuro-chirurgicale à l'Hôpital Việt - Đức et le Département de Neurologie à l'Hôpital Việt-Xô, le développement du Département neuro-chirurgical à l'Hôpital Militaire 108 et la Clinique neuro-psychiatrique à l' Académie Militaire de Médecine.

C'était donc la favorable condition pour nos collègues civils et militaires de concentrer leurs efforts pour le soin des malades. Avec cette coopération, le premier travail de la Chaire neuro-psychiatrique sur "Le syndrome neurologique des tumeurs malignes de la base du crâne" fut présenté par notre maître Dr. Nguyễn Quốc Ánh en Mars 1957 à l' Association Générale de Médecine et de Pharmacie du Vietnam et aussi à la Faculté de Médecine et de Pharmacie à Hanoi.

Ainsi l'assemblée des chefs de file comme nos prédécesseurs Nguyễn Quốc Ánh, Phạm Gia Triệu, Nguyễn Thường Xuân, Lê Văn Chánh, Đặng Đình Huấn avec le groupe d'avant-garde comme nos confrères Nguyễn Văn Đăng, Nguyễn Chương, Phan Chúc Lâm, Lê Xuân Trung, Nguyễn Việt, Trần Đình Xiêm et certains experts venus des pays socialistes comme les Docteurs Komáromy Laszlo, Kenarov, Boszormynéi… avait- clle contribué efficacement au développement de la Neurologie, Neuro-Chirurgie et Psychiatrie au Vietnam.

II. FONDATION DE L'ASSOCIATION DE NEUROLOGIE, PSYCHIATRIE ET NEURO-CHIRURGIE DU VIETNAM

Dans l' ambiance précitée, la réunion des trois spécialités médicales s'avérait impérative. Aussi, les actions pour une telle organisation étaient-elles animées en Août 1962 avec la participation des désignés représentants.

Le 1er Septembre 1962, le premier Congrès de Neurologie, Psychiatrie et Neuro-Chirurgie fut organisé solennellement au Grand Amphithéâtre à l'Hôpital de Bach Mai. Tous les délégués civils et militaires avaient unanimement ratifé les projets préparés par le Comité d'organisation du Congrès. Ensuite, le 3 Septembre 1962, l'Association de Neurologie, Psychiatrie et Neuro-Chirurgie du Vietnam fut officiellement fondée sous le témoin du Ministre de la Santé Dr. Phạm Ngọc Thạch et le Représentant de l' Association Générale de Médecine et de Pharmacie du Vietnam. Dr. Đặng Đình Huấn était élu Président; Dr. Nguyễn Quốc Ánh et Dr. Phạm Gia Triệu étaient Vice-Présidents. Dr. Nguyễn Thường Xuân était désigné Secrétaire Général. Dr. Nguyễn Văn Đăng; Dr. Lê Văn Chánh; Dr. Nguyễn Việt; Dr.Trần Đình Xiêm, Dr. Nguyễn Chương et quelques autres délégués faisaient partie du Comité exécutif. Le siège de l' Association était placé à la Clinique neuro-psychiatrique de Bạch Mai.

Le 2e Congrès fut organisé le 15 Septembre 1964. Beaucoup de travaux scientifiques présentés au Congrès avaient reflété les activités et le développement de nos spécialtés en ce temps.

Mais était déjà venue la période de guerre. Aussi les activités périodiques de l'Association étaient- elles temporairement suspendues. Cependant même dans les conditions difficiles du moment, nos confrères dispersés dans les différentes régions du pays continuaient leur travail quotidien comme médecins en prêtant soin aussi à la recherche scientifique. Le résultat de leurs besognes avaient été présentés plus

tard dans les conférences et congrès de notre Association.

Le 15 Aôut 1969, en accord avec le mouvement mondial de ce temps et sous la direction du Ministère de la Santé, Neuro-Psychiatrie fut séparée en deux spécialités. Dans cette nouvelle situation, les activités de notre Association avaient eu la tendance de se restreindre dans les coopérations bilatérales de neurologie et psychiatrie ou de neurologie et neuro-chirurgie.

III. APRÈS LA RÉUNIFICATION DU PAYS

Après la réunification du Vietnam, les activités de notre Association éprouvaient certaines modifications. En ce moment, beaucoup de nos confrères étaient déplacés du Nord au Sud. Certains autres revenus au pays après leur recyclage post-universitaire à l'étranger avaient rapporté l'état de développement scientifique dans le monde européen. D'autre part, le contact élargi avec les pays développés nous avait aidé de saisir les nouvelles acquisitions scientifiques. Aussi les sujets de nos réunions périodiques étaient-ils devenus de plus en plus en harmonie avec le développement des trois spécialités dans tout le pays.

Le mode commun de travail était d'organiser périodiquement les sessions d'éducation médicale continue en association avec les Chaires de Neurologie. La plupart de ces réunions avaient eu lieu dans les centres hospitalier-universitaires, notamment à l'Hôpital de Bạch Mai et à l'Hôpital Chợ Rẫy. C'étaient donc les conditions favorables pour développer nos spécialités, prémisse pour la fondation ultérieure des sociétés régionales. Lors de ces réunions nous avions coopéré avec les experts internationaux pour les échanges relatifs aux grands problèmes en neurologie. De leur part, nos collègues avaient invité les délégués de notre Association pour présenter nos travaux scientifiques en Asie, Afrique, Europe et aux Etats - Unis. De plus, certains de nos représentants étaient élus membres des organisations médicales internationales. Ainsi, durant vingt ans après 1975 et depuis la rénovation de notre pays, les activités de notre Association avaient reflétées clairement les succès des trois spécialités.

Pour notre part en neurologie, le centre d'intérêt était d'établir des nouveaux départements dans les hôpitaux urbains avec la présence de nos médecins spécialistes. Nous avions organisé donc des conférences et symposiums de neurologie à Hồ Chí Minh Ville, Cần Thơ, Huế, Đà Nẵng, Thanh Hóa, Thái Nguyên, Hải Phòng et Hà Nội avec la coopération active des experts venus des Etats - Unis, de France, de Belgique, du Japon, d' Australie et des pays du Sud - Est Asiatique.

L'événement mémorable fut l'admission de notre Association comme membre officiel de l' Association de Neurologie des pays du Sud - Est Asiatique (ASEAN Neurological Association / ASNA) le 27 Juillet à Singapore. Dès lors nous avons assisté régulièrement à toutes les activités de l' ASNA.

En ce qui concerne la neuro - chirurgie, beaucoup de départements de neuro - chirurgie ont été établis dans les grands provinces et villes. Nos confrères ont aussi coopéré largement avec leurs collègues internationaux en vue d'un développement des superspécialités notamment en micro - chirurgie.

Pour la Psychiatrie, un réseau de services hospitaliers a été développé dans la plupart des régions au Vietnam. Le 8 Août 1991, sur Décision du Ministère de la Santé, l' Institut

de Santé Mentale fut établi avec l'association de la Clinique Psychiatrique à l' Hôpital de Bạch Mai et la Chaire de Psychiatrie de l' Université de Médecine à Hà Nội. Actuellement l' Hôpital Psychiatrique Central a deux locations: le Service nº I à Thường Tín (Hà Nội) et le Service nº 2 à Biên Hòa (Đồng Nai).

IV. FONDATION DE L'ASSOCIATION DE NEUROLOGIE DU VIETNAM

Les activités fructifiantes des trois spécialités dans l' Association de Neurologie, Psychiatrie et Neuro - Chirurgie du Vietnam avaient été la condition importante pour une rénovation de notre organisation. C'était ainsi que la Décision nº 998 - QD - TTg le 24 Novembre 1997 du Président du Gouvernement de la République Socialiste du Vietnam, avec la dissolution de notre Association, a permis la fondation des trois sociétés indépendantes. L' Association de Neurologie du Vietnam fut donc fondée par le Congrès National de nos délégués civils et militaires le 20 Mai 1998 à Hanoi.

Pr. Phan Chúc Lâmétait élu Président; Pr. Lê Văn Thành et Pr. Lê Đức Hinh étaient Vice - Présidents. Pr. Nguyễn Chương était désigné Secrétaire Général. Le Congrès avait décidé de publier périodiquement la revue Thần kinh học (Neurologie) et prévu d'organiser le Congrès national suivant après quatre ans. D'autre part on avait encouragé l'établissement des sociétés régionales dans tout le pays. Dès lors les conférences étaient organisées régulièrement sur les sujets tels que: accidents cérébro - vasculaires, épilepsies, neuro - infections, dégénérescence du système nerveux...

Le Ier Congrès International sur les épilepsies avait été organisé les 25 et 26 Avril 2000 à l' Hôpital de Bạch Mai sous le patronage de la Fédération Internationale sur les Epilepsies (ILAE), l'Association de Neurologie des pays du Sud - Est Asiatique (ASNA) et, l'Association de Neurologie du Vietnam, Ensuite nous avions organisé avec succès le Ier Congrès International sur les Accidents cérébro - vasculaires le 25 Janvier 2002 avec la participation des représentants de Japon, Hong Kong, Taiwan, Singapore, Malaisie, Corée et Canada.

Dans le mouvement d' établissement des organisations locales, la Société de Neurologie de Hồ Chí Minh Ville fut fondéc le 20 Septembre 1995. Ensuite les autres sociétés successivement entraient en activité: à Cần Thơ le 19 Novembre 1998, à Thái Nguyên le 27 Octobre 1999, à Thanh Hóa le 12 Décembre 2000, à Hà Nội le 24 Juillet 2002 et à Tiền Giang le 4 Novembre 2014.

Un grand honneur pour notre Association était de présider le 2e Congrès International sur la sclérose en plaques de l' Asie et du Moyen Orient organisé à Hồ Chí Minh Ville les 19 et 20 Novembre 2004. Le plus important événement était l'admission de notre Association dans la Fédération Mondiale de Neurologie (World Federation of Neurology/WFN) à l' occasion du XVIIIe Congrès Mondial de Neurologie orgamisé à Sydney (Australie) en Septembre 2005. En même temps, notre Association était reconnue membre de l' Association de Neurologie de l'Asie et de 1 Océanie (The Asian and Oceanian Association of Neurology/AOAN).

Etant délégué dans le Panel du Conseil Asiatique pour les accidents cérébro - vasculaires (Asian Stroke Advisory Panel / ASAP), nous avions organisé un Symposium le 6 Décembre 2008 à l'occasion de la 25e Conférence de l' ASAP à Hanoi. Ensuite

était la Conférence du Printemps sur les épilepsies le 27 Avril 2010 avec la participation des délégués de Thailande, Singapore, les Philippines, Corée, Hong Kong, Inđonésie, Malaisie et Australie. Cétait aussi un programme d' éducation continue du Comité conseiller de l'épilepsie en Asie en coopération avec notre Association.

Durant plusieurs annéss nous avons coopéré avec le Conseil Central d'Expertise Médicale et le Comité Conseiller de l'Institut National de Médecine légale. Le Ministère de la Santé a désigné les spécialistes de notre Association pour la rédaction des Critères d'expertise des maladies et blessures de guerre, Critères des séquelles des expositions aux agents chimiques. Nous avons coopéré aussi avec l'rganisation Mondiale des Accidents cérébro - vasculaires (World Stroke Organization/WSO) pour le support aux services hospitaliers au Vietnam à partir d' Avril 2008 jusqu' à la fin de 2009.

Nos Sociétés à Hồ Chí Minh Ville et à Hanoi à tour de rôle ont organisé des conférences nationales notamment à l'occasion du cinquantenaire de la fondation de la Neurologie au Vietnam (2 Décembre 1956 - 2 Décembre 2006) et pour marquer dix ans de notre adhérence avec l'Association de Neurologie des pays du Sud - Est Asiatique (1997 - 2007). Le 16e Congrès de notre Association a eu lieu à l' Hôpital Militaire Central 108 en Décembre 2012 pour commémorer la fondation de la Neurologie militaire.

Sous la direction du Gouvernemenr et de l' Association Médicale du Vietnam, notre 3e Congrès national a élu le nouveau Comité d'administration. Dans ce mandat, Prof. Lê Đức Hinh a été désigné Président; Prof. Vũ Anh Nhị et Prof. Lê Văn Thính Vice - Présidents. Prof. Nguyễn Chương, Secrétaire Général. Notre Congrès a unanimenent élu Prof. Phan Chúc Lâm Président d'honneur de notre Association.

Acttuellement on compte plus de 350 membres actifs dans six sociétés de neurologie au Vietnam. Au cours de ces récentes années, nos collègues ont successivement formé des organisations spécialisées telles que la Société de Prévention des accidents cérébro - vasculaires, Société des épilepsies, Société anti - douleur, Société d'électrophysiologie et des maladies neuro - musculaires. D'autre part, beaucoup de nos délégués ont été reconnus membres de l' Académie de Neurologie Américaine (AAN), Société Française de Neurologie (SFN), Société Royale des accidents cérébro - vasculaires de Thailande (RTSS).. L'Organisation Internationale des Accidents cérébro - vasculaires (WSO) nous a permis de publier la version vietnamienne du Journal International des accidents cérébro - vasculaires (International Journal of Stroke) avec Pr. Lê Văn Thính comme éditeur.

En 2011, nous avons prêté concours à la rédaction du Dictionnaire Encyclopédique Médical Vietnamien et nous avons publié le petit Lexique des termes en neurologie. Les bulletins de notre Association et des Sociétés de Neurologie à Hà Nội et à Hồ Chí Minh Ville ont été publiés régulièrement. Notre Bulletin a été permis de publier trimestriellemnt en tant que Revue de Neurologie (Tạp chí Thần kinh học) à partir de Janviet 2013 avec le numéro d'immatriculation ISSN 2354 - 0931.

En somme, l' Association de Neurologie du Vietnam depuis nos premières activités dans l' Association de Neurologie, Psychiatrie et Neuro - Chirurgie du Vietnam,

reste toujours le compagnon fidèle des neurologues vietnamiens. Si durant les cinquante ans passés nous avons pu obtenir des résultats encourageants, nous devons nous efforcer encore dans l'avenir proche pour contribuer à l'édification de l' Association Médicale du Vietnam et la glorification de la Médecine Vietnamienne.

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RÉSUMÉ:

HISTOIRE ABRÉGÉE DE L' ASSOCIATION DE NEUROLOGIE DU VIETNAM (1962-2018)

Le Duc Hinh*, Nguyen Chuong**

** Délégué de l'Association de Neurologie du Vietnam à la Fédération Mondiale de Neurologie*

*** Président de l'Association de Neurologie du Vietnam*

Cet article relate succinctement les prineipales étapes du développement de l'Association de Neurologie du Vietnam. En se basant sur les aetivités de la Clinique neuro-psychiatrique à l' Hôpital de Bach Mai et de la Chaire de Neuro-Psychiatrie à la Faculté de Médecine et de Pharmacie de Hanoi depuis 1956, avec la collaboration entre trois disciplines civiles et militaires - Neurologie, Psychiatrie et Neuro-Chirurgie - le 3 Septembre 1962 fut fondée l' Association de Neurologie, Psychiatrie et Neuro-Chirurgie du Vietnam, Après la réunification du pays, vu les besoins de développement et les réelles activités des trois spécialités, le Gouvernement a dissous l'Association et permis la fondation des trois sociétés indépendantes. Ainsi, l'Association de Neurologie du Vietnam fut-elle officiellement établie le 20 Mai 1998. Actuellement on compte plus de 350 membres actifs dans six Sociétés de Neurologie au Vietnam. L'Association de Neurologie du Vietnam (ANV) fait partie de l'Association de Neurologie des pays du Sud-Est Asiatique (ASNA), de l'Association de Neurologie de l'Asie et de l' Océanie (AOAN) et de la Fédération Mondiale de Neurologie (WFN).

EVALUATION OF THE RESULTS OF CERVICAL DISC HERNIATION TREATED BY GALVANOPUNCTURE METHOD, COMBINATION OF THERMOMAGNETIC, MASSAGE AND STRETCHING THE SPINE

Le Thi Hoai Anh*, Pham Ba Tuyen*

ABSTRACT

Objectives: To evaluate the treatment results of cervical disc herniation by galvanopuncture method, massage combined with thermomagnetic and stretching the spine.

Materials and methods: Randomized clinical trial with proof. Over 60 patients was divided into two groups: test group and proof group.

Results and discussion: The results of the test group showed that: Pain relief with a mean VAS decrease of 1,63 ± 0,63 (point). All floding, stretch, tilt, rotation of cervical spine with an average reduction of 5,70 ± 1,53 (points). Functional improvement with an average NPQ decrease of 9,68 ± 1,93 (points). Results after 30 days of treatment: 56,7% good, 33,3% fair, 10,0% medium. All of these indexes significantly improved, that compared to the proof group, the difference is statistically significant (p <0,05).

Keywords: *Disc herniation, galvanopuncture, massage, physical therapy.*

I. BACKGROUND

The treatment of cervical spine herniation has many different methods such as fixed cervical spine with soft collar, physiotherapy combined with analgesic, pressure reduction of cervical spine with laser, injecting into disc, acupuncture, acupressure, stretching the spine [2], [3], [5]. Surgical treatment is used when the conservative treatment fails or the symptoms of nerve compression progress rapidly despite the conservative treatment [1]. Recently, clinical and subclinical studies about the treatment of this disease are still mainly surgical [1], [4]. The internal researches or the researches of traditional medicine and rehabilitation are not much.

Acupuncture, massage is a method of non-drug treatment of traditional medicine, that has long been used in the treatment of cervical disc herniation. Acupuncture and massage, however, only solve inelasticity, pain, and some neurodegenerative disorders, metabolic and nutritional disorders. They have not yet treated the disease of the disc herniation. With this factual demand and to further improve the effectiveness of treatment, we conduct research with the aim:

- Describe the results of the treatment of cervical disc herniation.
- Describe some factors related to the results of treatment of cervical disc herniation.

II. OBJECTIVES AND RESEARCH METHODS:

2.1. Objective and research place:

Including 60 patients who are diagnosed with spinal disc herniation and received inpatient treatment in the Department of Acupuncture - Rehabilitation, Hospital of Traditional Medicine, Ministry of Public Security.

2.2. Study period: form 03/2013 to 06/2014.

2.3. Research Methods:

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* *Study design*: Randomized clinical trial with proof.

* *Sample size*: 60 patients were divided into two groups:

- Proof group (30 patients): treated by galvanopuncture, massage.

- Test group (30 patients): treated by galvanopuncture, massage combined with thermomagnetic and stretching the spine.

* *Technology is applied in research:*

- Galvanopuncture:

+ Stimulation time: 30 minutes

+ Treatment process: 30 minutes once a day x 15-30 times.

* *Massage:*

- Principles of massage: Completely according to the traditional method, adherence to the rule of traditional medicine.

- Level of massage (heavy or light): Depending on the status of patients (real or not real) and tolerance threshold of each person.

- Massage process: 30 minutes once a day x 15-30 times.

* *Thermomagnetic*: Using 2-channel electrotherapy ITO-JAPAN.

- Place the magnetic plate on the treatment area, choose a temperature of 40º or 50º depending on the patient.

- Process: 20 minutes / time x 15- 30 days / treatment.

* *Stretching the spine*: Use stretching machine ITO-JAPAN TM 400 TM for stretching the cervical spine.

2.4. Data processing:

- The study data was analyzed by computer with the SPSS 16.0 program of the WHO.

- The results are expressed in the form of: Mean value and percentage (%)

- Use the square test to compare the difference between the two percentages.

- Use the T-Student test to compare the differences between the two mean values.

- Use the Logistic regression model to describe the relevant factors.

- With p <0,05 is considered statistically significant.

III. RESULTS

Table 3.1: Classification of the pre-treatment pain level according to the VAS scale

Group / Level	Proof group (n=30)		Test group (n=30)		p
	Patient numbers	Percentage %	Patient numbers	Percentage %	
No pain	0	0,0	0	0,0	>0,05
Mild pain	2	6,7	3	10,0	
Moderate pain	15	50,0	16	53,3	
Severe pain	13	43,3	11	36,7	
Total	**30**	**100**	**30**	**100**	

Results in Table 3.1 show that: The pre-treatment pain level according to the VAS scale in the two groups was not different (p> 0,05). The prevalence of moderate to severe pain is high. Mild pain in the proof group accounted for 50%, the test team accounted for 53,3%. Severe pain in the proof group accounted for 43,3%, and the research team accounted for 36,7%.

Table 3.2: Classification of pain level after 15 days of treatment

Group / Level	Proof group (n=30)					Test group (n=30)					P (After1/ After2)
	Before 1		After 1		P1 (Before1/ After1)	Before 2		After 2		P2 (Before2/ After2)	
	n	%	n	%		n	%	n	%		
No pain	0	0,0	2	6,7	< 0,05	0	0,0	7	23,4	< 0,01	< 0,01
Mild pain	2	6,7	8	26,7		3	10,0	10	33,3		
Moderate pain	15	50	14	46,6		16	53,3	10	33,3		
Severe pain	13	43,3	6	20,0		11	36,7	3	10,0		

Table 3.2 shows that: after 15 days of treatment, the pain level in the test group was significantly improved, only 3 patients with severe pain, the proportion of painless patients was 23,4%, the proportion of pain patients was 33,3%, mild pain accounted for 33,3%. In the proof group, the proportion of painless patients was 6,7%, 26,7% mild pain, 46,6% moderate pain, 20% severe pain. The difference of the proportion of pain level after 15 days of treatment in the two groups was statistically significant (p <0,01).

Table 3.3: Classification of pain level after 30 days of treatment

Group / Level	Proof group (n=30)					Test group (n=30)					P (After 1/ After 2)
	Before 1		After 1		P1 (Before 1/ After 1)	Before 2		After 2		P2 (Before 2/ After 2)	
	n	%	n	%		n	%	n	%		
No pain	0	0,0	5	16,7	< 0,01	0	0,0	14	46,7	< 0,001	< 0,05
Mild pain	2	6,7	9	30,0		3	10	10	33,3		
Moderate pain	15	50	3	43,3		16	53,3	6	20,0		
Severe pain	13	43,3	3	10,0		11	36,7	0	0,0		

After 30 days of treatment, the rate of pain level in both groups was different from before treatment with p <0,01 in the proof group and p <0,001 in the test group. In the test group, the percentage of patients without pain was 46,7%, mild pain accounted for 33,3%, and moderate pain accounted for 20%. No more severe pain. In the proof group, the incidence of painless patients was 16,7%, mild pain accounted for 30%, moderate pain accounted for 43,3%, the proportion of severe pain was 10%. The rate of pain level between the proof group and the test group was different (p <0,05).

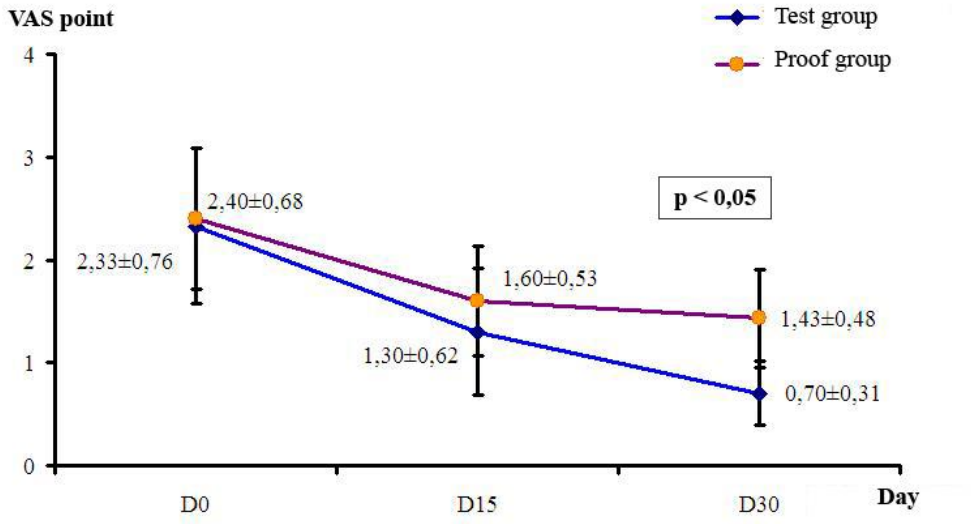

Chart 3.1: Comparison of pain relief efficacy at treatment times

Before treatment, the mean VAS score between the two groups was not statistically significant at p> 0,05. After treatment, at D15 and D30, the decrease of the mean VAS scores of each group were statistically significant (p <0,05). After 15 days of treatment, the mean difference of the test group was 1,03 ± 0,15 points, and the mean difference of the proof group was 0,8 ± 0,15 points. After 30 days of treatment, the mean difference of the test group was 1,63 ± 0,63 points, and the mean difference of the proof group was 1,97 ± 0,20 points. The improvement of mean VAS scores between the two groups at different times were statistically significant (p <0,05).

Table 3.4: Improvement of motility level after 15 days of treatment

Group / Level	Proof group (n=30)					Test group (n=30)					P (After1/ After2)
	Before 1		After 1		P1 (Before1/ After1)	Before 2		After 2		P2 (Before2/ After2)	
	n	%	n	%		n	%	n	%		
No restriction	0	0,0	2	6,7	< 0,05	0	0,0	6	20,0	< 0,05	< 0,05
Low restriction	1	3,3	7	23,3		3	10,0	7	23,3		
Medium restriction	18	60,0	11	36,7		15	50,0	11	36,7		
High restriction	11	36,7	10	33,3		12	40,0	6	20,0		

After 15 days of treatment, the incidence of improvement in spinal motility level in the proof and test groups was different (p <0,05). In the test group, the percentage of no restriction is 20%, 23,3% of low restriction, 36.7% of medium restriction, 20% of high restriction. In the proof group, the percentage of no restriction is 6,7%, 23,3% of low restriction, 36,7% of medium restriction, 33,3% of high restriction. The difference in rates of improvement of spinal motility at 10 days after treatment was statistically significant (p <0,05).

Table 3.4: Improvement of motility level after 30 days of treatment

Group / Level	Proof group (n=30)					Test group (n=30)					p (After1/ After2)
	Before 1		After 1		P1 (Before1/ After1)	Before 2		After 2		P2 (Before2/ After2)	
	n	%	n	%		n	%	n	%		
No restriction	0	0,0	6	20,0	<0,01	0	0,0	15	50,0	< 0,001	< 0,05
Low restriction	1	3,3	8	26,7		3	10,0	10	33,3		
Medium restriction	18	60,0	13	43,3		15	50,0	5	16,7		
High restriction	11	36,7	3	10,0		12	40,0	0	0,0		

After 30 days of treatment, the improvement of motility range of cervical spine in the test group increased sharply, in which the proportion of patients without restriction is 50%, 33,3% of low restriction, 16,7% of medium restriction. No more patients with high restriction in spinal motility level. In the proof group, the improvement of motility range of cervical was statistically significant (p <0,01), in which the proportion of patients without restriction is 20%, 26,7% of low restriction, 43,3% of medium restriction, 10% of high restriction. The difference about the improvement rates of the cervical spine the two groups was statistically significant (p <0,05).

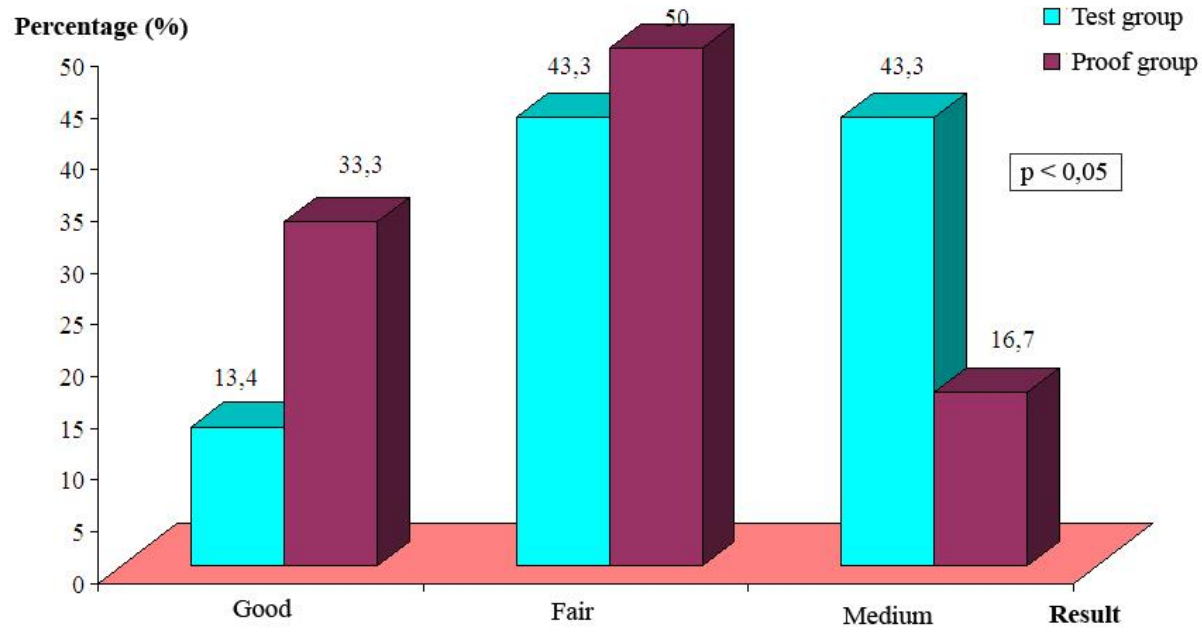

Chart 3.2: Overall results after 15 days of treatment

After 15 days of treatment, good results in the test group were 33,3%, and in proof group was 13,4%. The fair results in the test group were 50%, and in proof group was 43,3%. Neither groups had no outcome. Differences in treatment outcomes in the two patients groups were statistically significant at p <0,05.

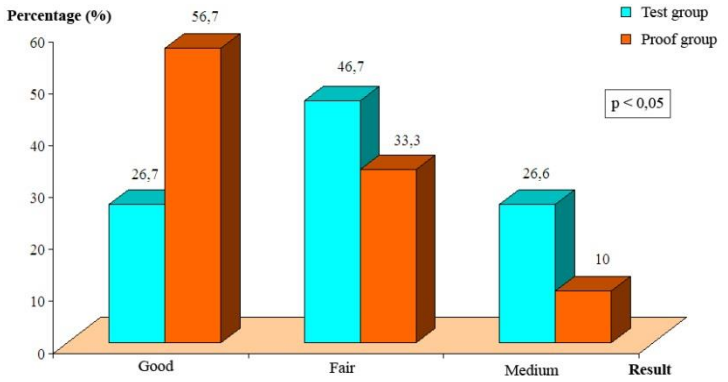

Chart 3.3: Overall results after 30 days of treatment

After 30 days of treatment, none of the patients had any outcome. The rate of patients who achieved good results in the test group was significantly higher than that of the proof group. Differences in treatment outcomes in the two patient groups were statistically significant (p <0,05).

Table 3.5: The relationship between some individual factors and the outcome of treatment

Factors	**Treatment results**		**OR CI 95%**	**p**
	Good n (%)	Not good n (%)		
Age	48	12	4,60 [0,58-36,67]	0,18
>30	46 (82,1)	10 (17,9)		
≤30	2 (50,0)	2 (50,0)		
Gender	48	12	1,96 [0,54-7,07]	0,29
Female	28 (84,6)	5 (12,2)		
Male	20 (74,1)	7 (25,9)		
Circumstances of disease	48	12		
Nature	40 (85,1)	7 (14,9)	1	
Wrong posture	7 (63,6)	4 (36,4)	3,27 [0,75-14,17]	0,11
After injury	1 (50,0)	1 (50,0)	5,71 [0,32-102,39]	0,24

Individual factors such as age, gender, and circumstances of the disease, have not yet been linked to treatment outcomes.

Table 3.6: The relationship between disease duration and treatment outcome

Disease duration	**Treatment results**		**OR**	**95%CI**	**p**
	Good n(%)	Not good n(%)			
≤ 3 month	42 (82,35)	9 (17,65)	1		< 0,05
> 3 month	4 (44,44)	5 (55,56)	5,83	1,03- 34,59	
Total	**46 (76,67)**	**14 (23,33)**			

The study results in Table 3,6 show a statistically significant relationship between disease duration and outcome (OR = 5,83; CI: 1,03- 34,59; p < 0,05). Patients with disease duration ≤3 months had 5,83 times better result than patients with disease duration > 3 months.

Table 3.7: The relationship between the hernia characteristics and the treatment outcome

Hernia characteristics	Treatment results		OR CI 95%	p
	Good n(%)	Not good n(%)		
Level	48	12		
Mild	5 (100,0)	0 (0,0)		>0,05
Moderate	30 (96,8)	1 (3,2)	1	
Severe	13 (54,2)	11 (45,8)	25,38 [2,95-1127,63]	< 0,05
Position of the hernia	48	12		
C2- C3	3 (75,0)	1 (25,0)	0,73[0,07-7,75]	1,0
C3-C4	28 (80,0)	7 (20,0)	1,0[0,28-3,61]	1,0
C4-C5	32 (76,2)	10 (23,8)	0,40[0,08-2,05]	0,32
C5-C6	31 (73,8)	11 (26,2)	0,17[0,02-1,39]	0,09
C6-C7	19 (79,2)	5 (20,8)	0,92[0,25-3,32]	1,0
C7- T1	0 (0,0)	0 (0,0)		

In Table 3.7, there was an relationship between the level of hernia and the outcome (OR = 25,38, CI: 2,95 - 1127,63, p <0.05) and there is no relationship between the position of the hernia and the outcome of the treatment.

IV. DISCUSSION

To measure the pain level of patient, we used the VAS (Visual Analogue Scale) which is a scale of pain assessment based on the subjective perception of the patient. Before treatment, the level of pain between the two groups was similar (p> 0,05). After 15 days of treatment, the level of pain of the two groups was reduced, however, in the test group, it decreased markedly (p <0,01), compared with proof group (p <0,05). Severe pain of the proof group accounted for 43,3%, after 15 days the treatment, it was reduced to 20%; severe pain of the test group accounted for 36,7% and after 15 days the treatment, its was 10%. The proportion of moderate pain in the proof group before treatment was 50%, after 15 days of treatment was 46.6%; it in the test group was 53,3% and after 15 days of treatment was 33,3%. The proportion of no pain + mild pain in the proof group after 15 days of treatment was 6,7% + 26,7% = 33,4%; of the test group was 23,4% + 33,3% = 56,7%, which is higher than the proof group. The difference about pain level after 15 days of treatment in the two groups was statistically significant (p <0,001)

Evaluation after 30 days of treatment, the rate of patients with no pain and mild pain in both groups increased significantly compared to before treatment (p <0,001). Of these, the ratio of the no pain in test group was 46,7%, and in the proof group was 16,7%; patients with mild pain accounted for 33,3% in the test group, and 30% in the proof group; patients with moderate pain accounted for 20% in the test group and 43,3% in the proof group. There were no patients with severe pain in test group, but the proof group was 3 patients (10%). Comparing the results between the two groups, we found that the proportion of patients without pain in the test

group was higher than that in the proof group (p <0,05). Nam Tien Chu autor also studied the treatment of spinal disc herniation with acupressure combined with streching spine. His results: 46% patient without pain, 48% patient with mild pain, 6% patient with moderate pain [2]. Comparing with this finding, we found that the ratio of patient with painless in our test group was comparable, and the ratio of patient with moderate pain is higher.

The authors conclude that pain is the earliest clinical indication in the spinal disc herniation and it is often the main cause of hospitalization for patients [1], [7]. Research of Hiep Duc Nguyen (50% neck pain, 39.48% shoulder pain, 28.95% root pain), Tam Thi Nguyen (51.3% neck pain), Nam Tien Chu (100% neck pain). Thus, treatment of spinal disc herniation using acupuncture, massage combined with thermomagnetic and stretching the spine is more effective pain relief than the treatment with acupuncture and massage.

After treatment, patients with disc herniation significantly decrease, but there was still a high proportion of patients with moderate pain, due to the complexities of the disc herniation mechanism, so the treatment for pain relief in cervical disc herniation is more difficult than the treatment for pain relief in neck-shoulder due to common causes such as cold, spinal degeneration [6]...This was explained for our result compared with the results of Tham Thi Nguyen 's study, which about the neck-shoulder pain in cervical spinal degeneration treated by physical therapy combined with exercise. (70.7% painless, 25.9% mild pain).

Before treatment, the patients in the study had been limited of cervical spinal mobility from low to high, with no patients without any restriction, in which, medium and high restriction are major. Medium restriction: the proof group accounted for 60%, the test group accounted for 50%. High restriction: the proof group accounted for 36,7%, the test group accounted for 40%. The restriction in the two study groups was not significantly different (p> 0,05).

After 15 days of treatment, the cervical spine movement (assessed by six movements) of both groups improved, but in the test group, the improvement was more pronounced (p <0,05). The evaluation of cervical spine movement in both groups before discharge increased significantly (p <0,01). The improvement of all six movements: Folding, stretching, tilting to pain side, tilting to painless side, rotating to pain side, rotating to painless side of the test group were all higher than those of the proof group. This difference was statistically significant with p <0,05.

V. CONCLUSION

Galvanopuncture methods, massage combined with thermomagnetic and stretching the spine have specific effects, include:

- Pain relief with an average reduction of VAS score of 1,63 ± 0,63 (point).
- Improve the cervical spine movement of all movements (floding, stretch, tilt, rotation) with an average reduction of 5,70 ± 1,53 (points).
- Improve living functions with an average decrease of NPQ of 9,68 ± 1,93 (points).
- After 30 days of treatment, the results of spinal disc herniation treated by galvanopuncture, massage combined with thermomagnetic and stretching the spine: 56,7% Good, 33,3% fair, 10% medium.

All of these indexes were significantly improved compared to those treated with galvanopuncture and massage, the differences is statistically significant (p <0,05).

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RÉSUMÉ:

EVALUATION DES RÉSULTATS DU TRAITEMENT DE L'HERNIE DISCALE CERVICALE PAR GALVANOPUNCTURE, COMBINANT LA THERMOMANÉTIQUE, LE MASSAGE ET L'EXTENTION DU RACHIS

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Objectifs: Evaluer les résultats du traitement de l'hernie discale cervicale par galvanopuncture, combinant la thermomanétique, le massage et l'extention du rachis.

Matériel et méthode: Etude clinique randonmisée avec preuve à l'appui. Plus de 60 patients ont été répartis en deux groupes, le groupe test et le groupe témoin.

Résultats et discussion: Les résultats du groupe test ont montré: La disparition de la douleur avec la diminution moyenne du VAS (Visual Analogue Scale) de 1.63±0.63 (point). Tout mouvement, toute extension, toute deviation, rotation, du rachis cervicale avec reduction moyenne de 5.70±1.53 (point). L'amélioration fonctionnelle avec une diminution de la moyenne NPQ de 9.68±1.93 (point). Les résultats du traitement après 30 jours de traitement ont été bons dans 56.7% de cas, 33.3% satisfaisants, 10.0% moyens. Tous les indices sont améliorés, et la différence avec le groupe témoin est statistiquement significative.

Mots clés: *Hernie discale, galvanopuncture, massage thérapie physique.*

STUDYING THE ANTI-INFLAMMATION EFFECT OF HPmax IN THE EXPERIMENT

Pham Ba Tuyen*, Nguyen Trong Thong**

ABSTRACT

Target: Studying the anti-inflammatory effect of the hard capsule of HPmax in the experiment. ***Research method:*** the hard capsule of HPmax is used at the dose of 560mg/kg and 1120mg/kg on white mice to study the effect of the acute anti-inflammation and at the dose of 840mg/kg and 1680mg/kg to study the effect of the chronic anti-inflammation in experiments. ***Result:*** HPmax can reduce the volume of fluid caused by inflammation but does not change the amount of leucocytes as well as the content of protein in the fluid on the peritonitis of white sewer-rat. HPmax has the effect of chronic anti-inflammation on the model of causing inflammation by amiant.

Key words: *HPmax, acute anti-inflammation, chronic anti-inflammation, experiment.*

I.BACKGROUND

Gastric and duodenal ulcer is quite common in Vietnam as well as in the world. According to statistics in many countries, the incidence of gastric and duodenal ulcer is about 10% of the population. In Vietnam, this incidence is about 6-7% [2]. Some herbs such as *Ampelopsis cantoniensis*, *Oldenlandia capitellata*, *Ardisia silvestris*... have been studied by some authors about the plant, chemical composition and some biological effects in the direction of treatment of gastric-duodenal ulcer [3], [5], [6]. Every herb studied has its own advantages and disadvantages. With the desire to increase the effect of treatment and limit the unwanted effects of each herbal drug when used separately, *Ampelopsis cantoniensis*, *Oldenlandia capitellata* and *Ardisia silvestris* have been combined to form HPmax. In order to have a scientific basis for evaluating the effect of treatment in clinical as well as experiment, we need to study the biological effect in the direction of treatment of gastric-duodenal ulcer. Therefore, the study was conducted in order to: *Study the anti-inflammatory effect of HPmax in the experiment*.

II. MATERIALS AND METHODS OF RESEARCH

2.1. Materials and objects of research

2.1.1. Medication

Sample: HPmax hard capsules contained in blister pack, there are 12 capsules in a blister pack produced by VINACOM Natural Products JSC.

The composition of each capsule consists of:

- *Ampelopsis cantoniensis*: 280 mg, *Oldenlandia capitellata*: 170 mg, *Ardisia silvestris*: 110 mg, Excipients: 1 capsule

Preparation of sample for mice to drink: carefully milled drug in the follicle, mixed with water to different concentrations for mice.

2.1.2. Research objects

- Heathy Swiss white mice, both male and female, with 18 - 22g weight are provided by

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the National Institute of Hygiene and Epidemiology.

Mice were housed in the laboratory of Pharmacology Department on three days prior to the study and during the study period, they are feeded with standard for mice (provided by the National Institute of Hygiene and Epidemiology), drinking water freely.

2.2. Drug, chemicals and machinery for research

- Acetic acid solution 1%
- Carrageenin solution 1%
- Hot plate model - DS37 of Ugo-Basile (Italy)
- Plethysmometer No7250 of Ugo-Basile (Italy)

2.3. Research Methods

2.3.1. *Study the anti-inflammatory effects: 2 models*

** Model of the inflammation on foot's mice caused carrageenin:*

White mice were randomized into 4 lots, there are 10 mice per lot.

- Lot 1 (proof): take distilled water (1ml/100g weight/day)
- Lot 2: take aspégic (200 mg/kg/day)
- Lot 3: take HPmax (560mg/kg/day)
- Lot 4: take HPmax (1120mg/kg/day)

Mice took medication or water for five consecutive days before caused inflammation.

On day 5, after 1 hour taking, inject 0.05ml in carrageenan solution 1% causing inflammation (mixed in physiological saline) per mice into the posterior right subcutaneous of the arch of mice.

Measure the volume of the foot rat (to the ankle joint) with specialized equipment at the following times: before inflammation (V_0), after 2 hours (V_2), 4 hours (V_4), 6 hours (V_6) and 24 hours (V_{24}).

The result is calculated according to Fontaine's formula:

+ The increase of foot mice volume is calculated by the formula:

$$\Delta V\% = \frac{V_t - V_0}{V_0} \times 100$$

Where: V_0 is the volume of the foot mice before inflammation

Vt is the volume of the foot mice after inflammation

+ The anti-inflammatory effect of the drug was evaluated by the inhibition of swelling (I%).

$$I\% = \frac{\Delta\overline{V}_c\% - \Delta\overline{V}_t\%}{\Delta\overline{V}_c\%} \times 100$$

Where: $\Delta\overline{V}_c\%$: mean volume increase of the foot mice in the lot 1

$\Delta\overline{V}_t\%$: mean volume increase of the foot mice in the other lots

** Model of peritoneal fluid effusion:*

White sewer rats were randomized into 4 plots, each of 10 sewer rats

- Lot 1 (proof): take distilled water (1ml/100g weight/day)
- Lot 2: take aspégic (200 mg/kg/day)
- Lot 3: take HPmax (560mg/kg/day)
- Lot 4: take HPmax (1120mg/kg/day)

Rats took medicine or water for five consecutive days before causing inflammation. At day 5, after 1 hour of taking medicine, the peritonitis is caused by the following solution: 0.05 g carragenin, 1.4 ml formaldehy mixed in physiologically saline to 100 ml of solution. Inject 2 ml of solution per mice into the peritoneum.

After 24 hours of inflammation, perform mice-abdominal surgery and inflammatory fluid suction. Measurement of inflammatory

fluid volume, white blood cell count and protein quantification in inflammatory fluid.

2.3.2. Study the chronic anti-inflammatory effect of HPmax

White mice were randomized into 4 lots, each of 10 mice.

- Lot 1 (proof): take distilled water (0.2ml/10g/day)
- Lot 2: take prednisolon (5mg/kg/day)
- Lot 3: take HPmax (840mg/kg/day)
- Lot 4: take HPmax (1680mg/kg/day)

Chronic inflammation by implanting amiant fibers with 6mg weight (120ºC for 1 hour) was soaked with 1% carrageenin solution under the nape of each mice.

After granulomatous transplantation, the mice were feeded distilled water or drug continuous 9-day. After taking the last dose for 1 hour, the mice were operated, the granulomas was removed, then dried at 56^0C for 18 hours. Calculate the weight of the dried granulomas (after subtracting the amiant weight).

2.4. Data processing: The research data is expressed in terms of $\overline{X}$ ± SD. The data are processed statistically by Student's t-test statistical algorithm using Microsoft Excel software. The difference is significant when p <0.05.

III. RESEARCH RESULTS

Table 3.1: Effects of HPmax on the volume increase of foot mice after inflammation

Lot	n	The volume increase of foot mice (%)			
		After 2 hours	***After 4 hours***	***After 6 hours***	***After 24 hours***
Lot 1 (proof)	10	42,23 ± 8,80	47,34 ± 9,45	46,91 ± 8,72	4,78 ± 2,42
Lot 2 (take 200mg of Aspégic /kg/day)	10	21,22 ± 9,54	38,64 ± 6,46	36,67 ± 8,67	2,57 ± 1,95
p compared to proof		**< 0,01**	**< 0,05**	**< 0,05**	**< 0,05**
I%		**49,75**	**18,39**	**21,82**	**46,16**
Lot 3 (take 560mg of HPmax/kg/day)	10	40,02 ± 9,13	46,58 ± 9,25	44,89 ± 7,69	4,91 ± 2,35
p compared to proof		> 0,05	> 0,05	> 0,05	> 0,05
p compared to lot 2		**< 0,01**	**< 0,05**	**< 0,05**	**< 0,05**
Lot 4 (take of 1120mg of HPmax/kg/day)	10	40,31 ± 7,93	47,72 ± 9,73	45,75 ± 10,14	4,99 ± 2,33
p compared to proof		> 0,05	> 0,05	> 0,05	> 0,05
p compared to lot 2		**< 0,01**	**< 0,05**	**< 0,05**	**< 0,05**

The results in Table 2.3 show that:

- 200 mg Aspégic per kg inhibit edema of foot mice at all study points (2h, 4h, 6h and 24h after inflammation caused by carrageenin) (p <0.01 compared to proof and p <0.05).

- Both doses of 560 mg/kg/day and 1120mg/kg/day of HPmax for 5 consecutive days did not alter the volume increase (p> 0.05) at the point times of study. Therefore, HPMax does not inhibit the edema (I%).

Table 3.2: Influence of HPmax on the volume of inflammatory fluid, white blood cell count and protein content in inflammatory fluid

Lot	n	The volume of inflammatory fluid (ml)	White blood cell count (G/l)	Protein content (mg/dl)
Lot 1 (proof)	10	4,03 ± 0,81	5,02 ± 0,45	19,26 ± 4,81
Lot 2 (take 200mg/kg/day Aspégic)	10	2,94 ± 0,83	4,66 ± 0,17	12,84 ± 3,08
p compared to proof		***< 0,05***	***< 0,05***	***< 0,01***
Lot 3 (take 560mg/kg/day HPmax)	10	3,00 ± 1,03	5,40 ± 0,73	19,01 ± 6,42
p compared to proof		***< 0,01***	> 0,05	> 0,05
p compared to lot 2		< 0,01	< 0,01	< 0,05
Lot 4 (take 120mg/kg/day HPmax)	10	1,42 ± 1,17	4,90 ± 0,20	19,33 ± 5,98
p compared to proof		***< 0,001***	> 0,05	> 0,05
p compared to lot 2		< 0,01	< 0,01	< 0,01

The results in Table 2.4 show that:

- Aspégic with dose of 200mg/kg significantly decreased the volume of inflammatory fluid, white blood cell count and protein content in inflammatory fluid (p <0.05 and p <0, 01).

- Both doses of 560mg/kg/day and 1120mg/kg/day of HPMax for 5 consecutive days significantly reduced the volume of inflammatory fluid compared with the proof (p <0.01 and p <0.001), but not change white blood cell counts and protein content in inflammatory fluid (p <0.05).

Table 3.3: Effect of HPMax on granulomatous weight

Lot	Dry granulomatous weight (mg)	p compared to lot 1
Lot 1 (proof)	13,00 ± 3,37	
Lot 2 (take 5mg/mg prednisolon solution)	8,10 ± 4,38	***< 0,05***
Lot 3 (take 840mg/kg/day HPmax)	10,30 ± 3,56	**< 0,05**
Lot 4 (take 1680mg/kg/day HPmax)	9,78 ± 3,99	**< 0,05**

The results in Table 2.5 show that:

- Prednisolon with dose of 5mg/kg have an chronic anti-inflammatory effect on the experimental granulomatous model, which significantly reduced the granulomatous weight compared with the proof (p <0.05).

- Both doses of 840mg/kg/day and 1680mg/kg/day of HPmax for 9 consecutive days resulted in a statistically significant decrease in the granulomatous weight compared with the proof ($p < 0.05$).

IV. DISCUSSION

**** The acute anti-inflammatory effect on the model of peritonitis:***

In the model of peritonitis, we used carrageenin (polysaccharide) which is an antigen, and low-level focaldehyde. So this model will initiate acute inflammatory processes, the nature of this process is the response of immune cells that is neutrophils and macrophages. On the other hand, the humoral immune response (B lymphocytes) also participates in the acute inflammatory process caused the polysaccharide antigen [1]. The acute anti-inflammatory effect of HPMax was compared with aspirin at a dose of 200mg/kg. This is a non-steroidal anti-inflammatory drug that is effective against acute inflammation [1]. Both doses of 1.0 capsule/kg/day and 2.0 capsules/kg/day of HPmax for 5 consecutive days significantly reduced the volume of inflammatory fluid compared to the proof ($p < 0.01$ and $p < 0.001$), but did not change white blood cell count and protein content in inflammatory fluid (compared with proof, $p > 0.05$). Because the composition of HPmax have *Ampelopsis cantoniensis*, *Oldenlandia capitellata*, *Ardisia silvestris*, that have anti-inflammatory, analgesic effect [4], [5], [7].

**** The anti-inflammatory effect on the model of edema of foot sewer-rat:***

On the model of edema of foot sewer rat, the antigen is carrageenin, which is a polysaccharide resembling a bacterial shell, so that the body's immune response is primarily a non-specific immune response with the involvement of macrophages, neutrophils…[1], [8]. The manifestation of this inflammation process is vasodilatation, the moving of leucocytes into the bloodstream, the increase of prostaglandin, histamine, leucotrienes, mainly observed as edema. Both doses of 560mg/kg/day and 1120mg/kg/day of HPmax for 5 consecutive days did not reduced the volume increase of foot rat, (compared with the proof, $p > 0.05$) at the point times of study. Therefore, HPMax does not inhibit edema (I%).

**** The chronic anti-inflammatory effect in white mice:***

Thymus-dependent antigens (example, in the chronic inflammatory model, the antigens are the amiante) initiate the cell-mediated immunity as a second-line immune response in addition to humoral immune response. This is to eliminate the alien antigen that is the responsibility of T lymphocytes. Prednisolon is a classic steroid anti-inflammatory drug, inhibits the T lymphocytes-mediated immune responses, so that should be used as a positive proof medicine [1]. Both doses of 840mg/kg/day and 1680mg/kg/day of HPmax for 9 consecutive days resulted in a statistically significant decrease of the granulomatous weight compared with the proof ($p < 0.05$).

In summary: HPmax has an anti-inflammatory effect in the experiment. Because the HPMax component consist of *Ampelopsis cantoniensis*, *Oldenlandia capitellata*, which have anti-inflammatory effects in the experiment and clinical trials. [4], [5], [7].

V. CONCLUSION

- HPmax reduced the volume of inflammatory fluid, but did not change the number of white blood cells as well as the

protein content in the inflammatory fluid in the model of peritonitis in white rats. HPmax did not inhibit edema in the model of edema of foot white sewer rat caused carrageenin.

- HP max has chronic anti-inflammatory effect in the inflammatory model caused by amiante.

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RÉSUMÉ:

L'EXPÉRIENCE DANS L'ÉTUDE SUR L'EFFET ANTI-INFLAMMATOIRE DE L'HPmax

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Objectif: Etude de l'effet anti-inflammatoire de la capsule dure de l'HP.

Méthode: la capsule dure de l'HP est utilisée à la dose de 560mg/kg, et 1.120mg/kg dans l'étude de l'inflammation aigue et à la dose de 840mg/kg et 1.680mg/kg pour l'étude de l'inflammation chronique chez la souris blanche.

Résultat: l'HPmax peut réduire le volume du fluide causé par l'inflammation mais ne change pas le nombre de leukocytes aussi bien que la teneur de protéine dans le fluide de la péritonite du rat blanc d'égouts. L'HPmax possède l'effet anti-inflammatoire chronique sur le modèle d'inflammation causée par l'amiante.

RESULTS OF THE STUDY ON *NAJA SIAMENSIS* ANTIVENOM PURIFICATION IN VIETNAM AND AN ASSESSMENT OF SAFETY AND EFFECTIVE TESTS IN VITRO AND IN VIVO

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ABSTRACT

Objectives: Snake antivenom is an antidote of treatment for snakebite envenomed patients to save their lives. Moreover, antivenom treatment will reduce the complications of these snakebite patients if they are treated early. Until now, *Naja siamensis* (*NS*) antivenom is not available in Vietnam and the world. Therefore, *NS* antivenom production is performed urgently to treat envenomed patients. ***Methodology:*** The study established a protocol for purification of $F(ab')_2$ *NS* antivenom by using pepsin enzyme to cut Fc of IgG *NS* horse antibody and removing complements and non-antibody components. Safety and efficacy tests were performed according to medium lethal dose (LD_{50}) and medium effective dose (ED_{50}). ***Results:*** this study produced successfully liquid and lyophilized *Naja siamensis* antivenoms which got Vietnamese National standardizations and WHO recommendations. An assessment of *NS* antivenom in vitro and in vivo showed high safety and strong efficacy. ***Conclusion:*** The study on *NS* antivenom $F(ab')_2$ purification is successful. We hope that the study will spreads out in future.

Keyword: *Naja siamensis antivenom; Safety and efficacy assessment.*

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I. INTRODUCTION

In 2009, World Health Organization (WHO) arranged snake bites into neglected tropical diseases and reconfirmed that venomous snake antivenom is an antidote only of the treatment for envenomed patients by snake venom [9],[10]. Unavailable of specific antivenoms to treat the envenoming patients due to many venomous snake species in different areas in the world becomes an important serious medical problem in the world [10].

From 1894, Dr. Calmette successfully researched to produce cobra antivenom in Sai Gon Institute firstly in the world [4]. As a result, treatment of snake envenoming spreaded out as a new trend in using antidote on antivenom [4]. Theakston showed an evidence-base for effectiveness of antivenom treatment based on ELISA technique [8]. In Vietnam, the researchers under Trinh Kim Anh and Trinh Xuan Kiem's leaders have produced successfully *Naja kaouthia* antivenom in Cho Ray hospital from 1993 [3].

Then, *Calloselasma rhodostoma*, *Ophiophagus hannah*, *Cryptelytrops albolabris* and *Bungarus candidus* antivenoms are made consequently to reduce mortality rate of snakebites from 20% to 2.7% in Cho Ray hospital [2],[7]. However, 10% *Naja siamensis* envenomed patient of snakebites is still a chanllenge of clinicians for lack of antivenom[7].

As a result, *NS* antivenom production is in great demands in clinical practice recently. The aim of this study is with a design not only to establish a protocol for *NS* antivenom purification, but also to assess the safety and efficacy in vitro and in vivo according to Vietnamese National Standards as well as WHO recommendation for antivenom products. The study contributed to resolve for lack of *NS* antivenom in current treatment in Vietnam.

II. MATERIALS AND METHODOLOGY

2.1. Materials

- High titre of *NS* specific antibody of immunized horse plasma, sterilised, anti-coagulation by heparin, plasmapheresis by contrifuge after blood withdrawing during 24-48 hrs and storing in 2-8^{0}C.

- Choosing 30 out of 157 vials of *NS* antivenom produced from the study by randomized for an assessment of safety and effectiveness tests.

- *NS* venom supplied from KLT Technological Medicine joint-stock Company.

- Bacterial (Sabouraud and Thioglycolate) and fungal mediums supplied by Micobiology Department of Cho Ray Hospital.

- 120 white mices (18-20grams/mice), 03 Guinea-pigs (200-250grams/cobay) and 03 rabbits (1.75-2.0 kilograms/rabbit) supplied by Military Medical University.

- Sterilized freeze chamber, temperature changed of water hotpot, pH meter, sterilized inox container, filter, Whatman's paper, cellulose acetate membrane, autoclave, inspirator, Christ lyochameer Guard, vials.

- Specialised chemicals: pepsin (Merck), ammonium sulfate (Merck), acid sulfuric, acid chlorhydric, NaOH, toluen, sterized water.

2.2. Methodology: In vitro and in vivo 's animal model:

- Establishing a protocol for purified F(ab')$_2$ *NS* antivenom production.

- An assessment of quality control of liquid and lyophilized *NS* antivenoms according to Vietnamese National Control Standards (Vietnam National Pharmacopoeia IV) [1].

- An assessment of *NS* antivenom of the safety, efficacy (based on LD_{50} and ED_{50}), pyrogens and sterilize in vitro and in vivo.

- Median Lethal Dose (LD_{50}): based on LD_{50} formula (Spearman-Karber): Log LD_{50} = LogX_{100} - {Log Fd(Σt-n/2):n} (LD_{50}: medium lethal dose; Log X_{100}: Log of lowest lethal dose; Log Fd: Log of between lethal dose; n: number of mice for each dose; t: numbers of mice death; Σ: SUM all doses, include from X_0 - X_{100}; and X_0: Log of highest dose without mice death).

- Median Effective Dose (ED_{50}):

+ Dilute NS antivenom, increase gradually from 10µl /ml to 60µl /ml.

+ NS Venom solution was diluted into normal saline 0.9% (10mg% = 100µg/ml), mixed well with each NS antivenom dilution, same volume. incubation of this solution at 37^{0}C/1h.

+ Mice-tail vein injection (NS venom solution + antivenom), V=0,5 ml/mice.

+ Number of mice: 8 mices /lot x 4 lots

+ Monitor in 24 hours, record the mice death / a live, ratio count (%).

- Pyogens test: Select 03 of healthy rabits, weight from 1,75 - 2,0 kg, living in Animal experimental zone of Toxicology and Military Radiation Department for a week. NS antivenom was injected into ear border

vein with volume V=3ml/kg x weight. Anal temperature was measured before and after an hour. It is normal if the range of lowest and highest temperature was less than 1^0C. If range was over 1^0C, pyogens substance confirmed reliably.

-Sterilized test: NS antivenom is cultured to identify bacteria and fungus in Saboraud, thioglycolate và fungal media at Department of Microbiology, Cho Ray hospital.

- Safety test: 03 of healthy cobays were selected. Their body weight were from 200 to 250g. They were in cage and accessed water and food easily for a week. NS antivenom was injected into peritonaeum. Volume was calculated by V=2ml/100g x weight. They were monitoring during 03 weeks for body weight and losing their hair. The test is evaluated normally if the Cobays were still normal development and gain weight. The NS antivenom is safety in animal experiments.

2.3. Time and place:

- The study was performed from 07/2012 - 10/2013 at Toxicology and Military Radiation Department, Haematology and Blood transfusion, No. 103 hospital, Protein-Toxins-Cell Unit, Centre for Research of Military Medical-Pharmacology, Military Medical University and Microbiology Department, Cho Ray Hospital.

III. RESULTS

3.1. Hyperimmune plasma immunized by *NS* antigen: Used 10 litres plasma collected by plasmapheresis (manual method), stored 2-8°C.

3.2. Established the protocol of purified F(ab')$_2$ *NS* antivenom:

3.2.1. Fc fragment of IgG antibody removal by pepsin enzyme: 10 litres of specific hyperimmune plasma against *NS* venom were mixed and stired with 100g pepsin at pH 3.2 at 20°C for 60 minutes; and ensured the sterilization during a manufracturing process.

3.2.2. Removal of non-IgG antibody by ammonium sulfate salt: put 1400g salt into 10 litres plasma, dissolved and stirred with sterilization.

3.2.3. Complement reject by heat-treated step at 56^{0}C for 60 minutes.

3.2.4. Plasma solution was filtrated to eliminate the precipitation: 8 litres of collected solution.

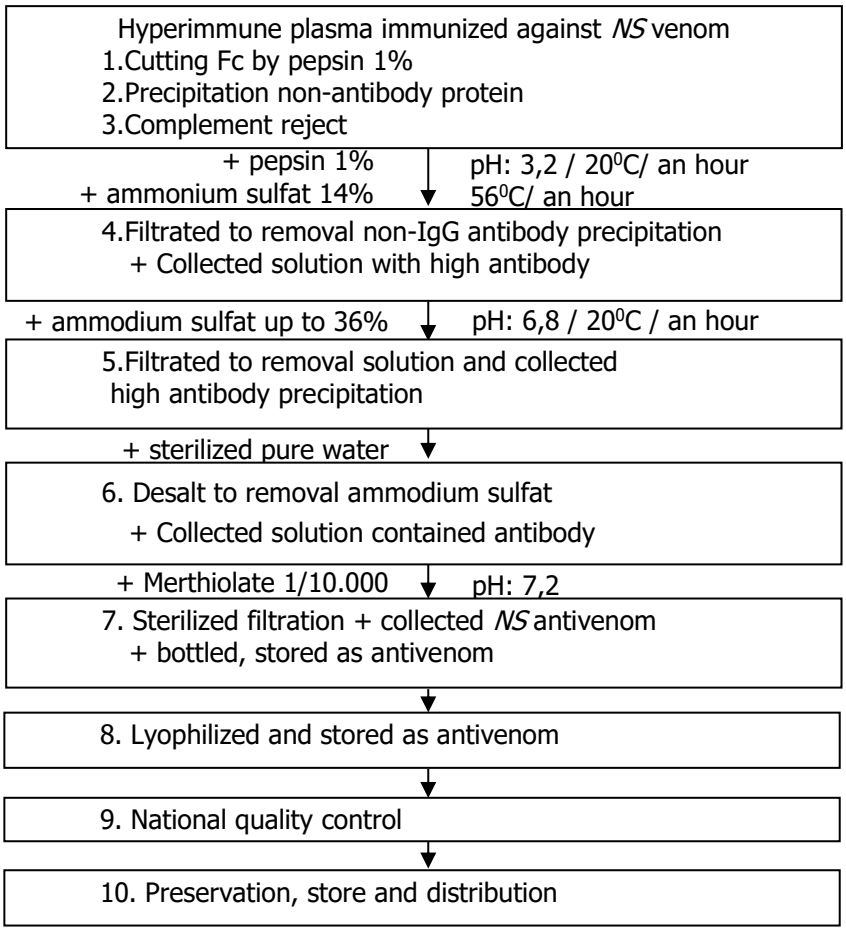
3.2.5. Precipitation of antibody by adding ammonium sulfate up to 36%: Dissolved ammonium sulfate salt into collected solution and kept it at a pH 6.8 for 60 minutes at 20°C. After that, the solution was filtrated to collect the precipitate: 600 grams.

3.2.6. Dissolved and desalt by cellulose acetate membrane to removal ammonium sulfate and collect 798 ml of F(ab')$_2$ solution.

3.2.7. Sterilised filtration by filter with ϕ =0.2µm colleted 785 ml F(ab')$_2$ NS antivenom. The antivenom was dispensed into containers (5ml vial): 157 vials, stored 2 - 8°C.

3.2.8. Lyophilized NS anivenom: put 100 vials (-80°C) into Christ lyophilized chamber up to 53 hours and got 92 lyophilized NS antivenoms and 08 vials without solution. Unsuccess rate was 8%.

Table 1: Summary diagram of technique protocol for NS antivenom F(ab')$_2$ purification



3.3. Quality Control of *Naja siamensis* antivenom: The results of quality controll at National Control institute for vaccine and biomedical products, Ministry of Health were passed at the cerfitications: Number 00114/SPĐT-NC and 00214/SPĐT-NC, dated 18th February, 2014.

Table 2. Results of NS antivenom quality control at National Control Institute for vaccine and biomedical products, Ministry of Health.

NS antivenom quality control	**Liquids**	**Lyophilized**
1. Eficacy	213,6 LD_{50}/vial	190,7 LD_{50}/vial
2. Pyogens	Passed	Passed
3. Unspecific Safety test in vivo according to Vietnamese Standards (VN I-1: 2009 PL 15.11.)	Passed	Passed
4. pH	7,281	7,699
5. Sterilized Requision	Passed	Passed
6. Total protein content	40 mg/ml	26 mg/ml
7. Physical properties:	Yellowish liquids, clear, no strange bodies.	Pink lyophilized but yellowish. No peel off. After being dissolved, yellowish liquids, clear, no strange bodies.

3.4. Assessment of potency test of *Naja siamensis* antivenom:

3.4.1. Identification of the median lethal dose (LD_{50}) NS venom of Vietnam:

Table 3. Identification of the median lethal dose (LD_{50}) of NS venom of Vietnam

Number	*NS* Venom titre (µg/ml)	*NS* venom/mice (µg)	Mice monitoring			Death rate (%)
			Live	Death	Total	
1	0	0	4	0	4	0
2	60	6	4	0	4	0
3	70	7	4	0	4	0
4	80	8	4	0	4	0
5	90	9	4	0	4	0
6	100	10	3	1	4	25
7	110	11	2	2	4	50
8	120	12	2	2	4	50
9	130	13	2	2	4	50
10	140	14	1	3	4	75
11	150	15	0	4	4	100
12	160	16	0	4	4	100
13	250	25	0	4	4	100
14	500	50	0	4	4	100

Number of mice/lot = 4 mices. *NS* venom volume injected per mice (ml)=0.5

Result: LD_{50} of *NS* venom in Vietnam = 12 µg/mice (20g).

3.4.2. Identification of efficacy of Naja siamesis antivenom (Effective dose-ED_{50}):

Table 4. Potency test of NS anitvenom.

No	NS antivenom (ml)	NaCl 0.9% solution (ml)	*NS* venom (100γ/ml)	Number of LD_{50} / mice	Mice monitoring		
					Death	Live	%
1	0.050	3.75	1.200	1	0	8	100
2	0.030	3.77	1.200	1	0	8	100
3	0.010	3.79	1.200	1	0	8	100
4	0.000	3.80	1.200	1	4	4	50

Remark: ED_{50} = 100 LD_{50} /ml = 1200µg/ml = 500 LD_{50} /vial = 6000µg/vial.

Results:

- 01 ml *NS* antivenom is able to neutrolize 100 LD_{50} = 1200 µg *NS* venom.
- 01vial *NS* antivenom (5ml) is able to neutrolize 500 LD_{50} = 6000 µg *NS* venom.

3.5. Pyrogen identification of *NS* antivenom (Pyrogen test):

Table 5. Pyrogen test of NS antivenom

Rabit No	Weight (kg)	*NS* antivenom injected (ml)	Rabit temperature before / after *NS* antivenom injection (°C)				Temperature difference
			Before	After an hour	After 02 hours	After 03 hours	
1	1.75	5.25	39.0°C	38.8°C	39.5°C	39.5°C	+ 0.5°C
2	1.80	5.40	39.9°C	39.5°C	39.4°C	39.4°C	- 0.5°C
3	1.90	5.70	39.3°C	39.2°C	39.2°C	39.45°C	+ 0.15°C

Remarks: During 3 hours, the temperature difference of rabbits after NS antivenom injection is less than 01°C.

Result: *NS* antivenom does not have pyrogens.

3.6. Identification of safety of *NS* antivenom in vivo (Safety test):

Table 6. Safety test of NS antivenom

Number	Weight (g)	NS antivenom (ml)	Cobay Monitoring				Gain weight (g)
			Depilation	Weight			
				1st week	2ndweek	3rd week	
1	210	4.2	No	215	220	230	+ 20
2	200	4.0	No	205	210	230	+ 30
3	220	4.4	No	230	240	245	+ 25

Remark: 03 cobays injected *NS* antivenom grew normal, gained weight, were not depilated and seen any diseases. Result: *NS* antivenom was safe on Cobay in vivo.

3.7. Identification of sterilization of *NS* antivenom (Sterility test):

NS antivenom had cultured in Saboraud media (20-25ºC), Thioglycolate media (30-35ºC) and fungal media in Microbiology Department, at Cho Ray Hospital. The samples were monitored during 07 days to find out bacterial and fungal growth.

Remark: Aerobic and anaerobic bacteria and fungus did not grow in media that *NS* antivenoms had cultured.

Results: *NS* antivenom showed sterilization with bacteria and fungus.

IV. DISCUSSION

4.1. Technical protocol for NS antivenom production is chosen antivenom F(ab')$_2$ purification by pepsin digestion and ammonium sulfate precipitation.

- Snake antivenom may be IgG, F(ab')$_2$ và Fab according to experiment, economic and religious belief of each country [5],[9]. Material for antivenom production is serum from imminized animal such as: horse, goat, sheep, carmel,... because a lot of blood were collected from them, easily to breed them in many different geographical and inviromental areas. Therefore, snake antivenom will be cheep and easy to use in rural area of many poor countries. Moreover, the disease from horse was studied carefully in past few years [4],[9]. However, Ovine serum resourses was suppied for Fab production but it was rare in Vietnam. Choosing horse to product F(ab')$_2$ is the best choice in Vietnam. It is suitable economy and riality. Many manufacture still choose protocol of F(ab')$_2$ antivenom production because they have alot of advantages comparision with IgG and Fab [5],[8],[9]. Fab is distribused quickly in whole body after injection an hour therefore it bind to venom then eliminate after 10 hours. They go throught kidney and make damage of kidney. Treatment needs to repeat many times if victims are severe. Price of Fab is highest antivenom production.

- Using pepsin digestion and ammodium sulfate precipitating, F (ab')$_2$ antivenom is good product. This protocol is based on experienced production of *Naja kouthia*, *Calloselasma rhodostoma* and *Bungarus* polyvalent, therefore, *NS* antivenom is cheep, less side effects and corresponding with patients living in rural area of our country [2],[3],[7],[9]. Production by pepsin digestion and acid caprylic precipitation showed to reduce the side effects of antivenom [6],[9]. However, this method is not easy and need more times for research and funding. Many doctors who need *NS* antivenom F(ab')$_2$ for treatment but until now, it is not available in the world and Vietnam.

4.2. Quality of *NS* antivenom:

- Results of liquid and lyophilized *NS* antivenoms were passed the National Quality Controls for biomedical products and accorded with WHO antivenom guideline [1],[9]. *NS* antivenom showed high safety and strong efficacy, no pyrogens and sterilization. Another biochemical indexes were passed the required Criteria. Therefore, the protocol of *NS* antivenom purification was established complete and suitable in practically economical condition in Vietnam.

- The difference of antibody potency between liquid and lyophilized antivenoms showed the incomplete protocol of lyophilization of antivenom production. We should do many tests for lyphiolized antivenom (lower refrigerated process before lyophilization, low vaccum pressure, longer time for lyophilization,…). However, 8% of diminished rate of lyophilized antivenom was accepted. It should be reduced the lowest in future. Lyophilized antivenom is long in used time more than liquid one as well as easy preservation and distribution to local hospital, which are less essensial equipments in rural areas but it is necessary for early treatment of snake venom envenomation. Therefore, we hope that *NS* (Indochinese cobra) patient mortality and sequela will go down if *NS* antivenom is supplied fully for early treatment.

4.3. Assessment of *NS* antivenom in vitro and in vivo:

- The study determined the median lethal dose (LD_{50}) of *NS* venom of Vietnam. This is a criterion for assessment of efficacy of antivenom as well as other studies about *NS* venom in the future. We have very rare basic studies on *NS* venom in recently. Therefore, determining of the median lethal dose is necessary in venom research in Vietnam.

- *NS* antivenom is defined safety in cobay test, no pyrogens and sterilization. These are the required criteria for clinical practice of antivenom treatment [8],[9].

- *NS* antivenom eficacy showed high potency 500 LD_{50}/vial (05ml). It was able to neutralize 6000µg *NS* venom (6mg/vial). This confirmed good quality of resource materials as well as determined good protocols of production of *NS* antigen and immunized horse schedule. It is also definition of perfect protocol of $F(ab')_2$ purifed *NS* antivenom production. As a result, we will organize the clinical trials for *NS* antivenom as soon as posisible to resolve a lack of *NS* antivenom in Clinical practice in Vietnam.

V. CONCLUSION

The study is established successfully the protocol of *NS* antivenom purification is more advanced and suitable in Vietnam's condition. The *NS* antivenom product showed high safety, strong efficacy in vivo, passed the Vietnamese National Quality Control in accordance with WHO snake antivenom guidelines.

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RÉSUMÉ:

RÉSULTATS DE L'ÉTUDE DE L'ANAVENIN DU *NAJA SIAMENSIS* PURIFIÉ AU VIETNAM ET LES TESTS D'ÉVALUATION POUR SA SÉCURITÉ ET SON EFFICACITÉ IN VITRO ET IN VIVO

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Objectifs: L'anavenin est une antidote de morsures de serpents, et qui peut sauver des vies humaines. Le traitement par anavenin pourra réduire les complications s'il est à temps. Jusqu'à ce jour, l'anavenin *Naja siamensis (NS)* n'est ni produit au Vietnam et ni au monde. Par conséquent, la production de l'anavenin pour le traitement en urgence est vivement demandée.

Méthodologie: Le protocole de la purification de (Fab')2 de l'anavenin *NS* utilisant l'enzyme pepsine pour couper le Fc du IgG de l'anavenin *NS* prélevé sur l'anticorps du cheval, dont les compléments et ceux non dotés d' anticorps sont enlevés. Les tests de sécurité et d'eficacité ont ete effectués suivant la dose léthale moyenne (LD50) et la dose effective moyenne (ED50)

Résultats: L'étude a produit avec succès l'anavenin du *Naja siamensis* sous forme liquide et lyophilisée et qui a recu la standardization Nationale du Vietnam et les recommendations de l'OMS. L'évaluation de l'anavenin in vitro et in vivo ont montré une haute sécurité et une grande efficacité.

Conclusion: L'étude de l'anavenin de *NS* (Fab')2 purifié a été un succès. Nous espérons sa multiplication dans l'avenir,

Mots clés: *Naja siamensis ananavenin; Evaluation de la securite, et de l'efficacité*

KNOWLEDGE OF THE HEALTH CONSEQUENCES OF TOBACCO SMOKING: A CROSS-SECTIONAL SURVEY OF VIETNAMESE ADULTS

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ABSTRACT

***Background*:** Although substantial efforts have been made to curtail smoking in Vietnam, the 2010 Global Adult Tobacco Survey (GATS) revealed that the proportion of male adults currently smoking remains high at 47.4%. ***Objectives*:** To determine the level of, and characteristics associated with, knowledge of the health consequences of smoking among Vietnamese adults. ***Design*:** GATS 2010 was designed to survey a nationally representative sample of Vietnamese men and women aged 15 and older drawn from 11,142 households using a two-stage sampling design. Descriptive statistics were calculated and multivariate logistic regression was used to examine associations between postulated exposure factors (age, education, access to information, ethnic group etc.) and knowledge on health risks. *Results*: General knowledge on the health risks of active smoking (AS) and exposure to second hand smoke (SHS) was good (90% and 83%, respectively). However, knowledge on specific diseases related to tobacco smoking (stroke, heart attack, and lung cancer) appeared to be lower (51.5%). Non-smokers had a significantly higher likelihood of demonstrating better knowledge on health risks related to AS (OR 1.6) and SHS (OR 1.7) than smokers. Adults with secondary education, college education or above also had significantly higher levels knowledge of AS/SHS health risks than those with primary education (AS: ORs 1.6, 1.7, and 1.9, respectively, and SHS: ORs 2.4, 3.9, and 5.7 respectively). Increasing age was positively associated with knowledge of the health consequences of SHS, and access to information was significantly associated with knowledge of AS/ SHS health risks (ORs 2.3 and 1.9 respectively). Otherwise, non-Kinh ethnic groups had significantly less knowledge on health risks of AS/SHS than Kinh ethnic groups. ***Conclusions*:** It may be necessary to target tobacco prevention programs to specific subgroups including current smokers, adults with low education, non-Kinh ethnics in order to increase their knowledge on health risks of smoking. Comprehensive messages and/or images about specific diseases related to AS/SHS should be conveyed using of different channels and modes specific to local cultures to increase knowledge on smoking health consequences for general population.

Keywords: *Knowledge; smoking*

I. OVERVIEWS

Over the past 10 years, Vietnam had made substantial efforts on tobacco control. In 2005, Vietnam ratified the Framework Convention on Tobacco Control (FCTC), and in August 2009, the Prime Minister's Decision No. 1315/Q D-TTg approved a plan to implement FCTC. The Ministry of Health, Ministry of Education & Training, and Ministry of Transport also issued official directives for the implementation of a smoke- free policy. At the same time, levels of smoking remain high in Vietnam. In 2001-02, 69.1% of men smoked cigarettes; 23.2% of men smoked water pipe tobacco. In addition, 63% of households had at least

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one smoker, and 71% of children under age 5 lived in households with at least one smoker (1). In 2003, nearly 60% of school-age youth reported being exposed to secondhand smoke at home (2). The prevalence of cigarette smoking among students was 3.3% overall, while that among male students was 5.9% (3). The 2010 Global Adult Tobacco Survey (GATS) in Vietnam showed that smoking pre- valence among adult males was 47.4%, and in a survey conducted in hospitals and public places evidence re- vealed that smoking was common (4, 5).

Knowledge is defined by the Oxford English Dictionary as expertise and skills acquired by a person through experience or education; while perception is the process by which humans interpret and organize sensation to pro- duce a meaningful experience of the world (6). It is now well established that if people's perceptions of the com- monality and acceptability of a behavior can be adjusted, their inclination to engage in that behavior may be in- fluenced. For example, the more common and acceptable young people think smoking is among their immediate peers, their family group and society as a whole, the more likely they are to take up the habit (7). Conversely, smoking uptake can potentially be reduced if pro- smoking norms are challenged and anti-smoking norms are strengthened. Gerards Hastings in his book titled 'Social Marketing - Why should the devil have all the best' wrote that 'Normative education or de-normalization programs, therefore, can correct erroneous perceptions of the prevalence and acceptability of drug and alcohol use and establish conservative group norms that are postulated to operate through lowering expectations about prevalence and acceptability of use and the reduced availability of substances in peer-oriented social settings'. Therefore, Article 4 of FCTC of the World Health Organization (WHO) stated that every person should be informed of the health consequences, addictive nature, and mortal threat posed by tobacco consumption and exposure to tobacco smoke. As a result, several countries have attempted to educate their populations about the health consequences of smoking (8, 9). The Vietnam Steer- ing Committee on Smoking and Health (VINACOSH) has made significant efforts to convey messages of tobacco control to Vietnamese population during the past 10 years by several Information, Education, and Communication (IEC) activities in cooperation with the International

Development Establishment (IDE). These activities con- sisted of celebrity television interviews; tobacco control communication activities in combination with a trans - Viet bicycle riding tour from Hanoi to Ho Chi Minh City; hosting training IEC workshops on designing a smokers' behavior influencing project, called 'Keep tobacco smoke away from your wife and kids' in Hai Phong City; and improving public awareness on the negative effects of tobacco on human health and the economy. VINACOSH has been cooperating with IDE in developing tobacco and secondhand smoke control IEC materials, applying social marketing approaches in design- ing IEC materials, and selecting relevant communication channels (10). Although many efforts have been made under the IEC programs in Vietnam, there is still a need for additional research to understand the relationship of

knowledge of smoking-health risks and smoking behavior in Vietnam. The purpose of this study was to identify the level of knowledge of health consequences of tobacco smoking and its associated factors to inform IEC pro- grams on reducing tobacco smoking.

II. METHODS

2.1. Selection and description of participants

Data used in this article were obtained from the 2010 GATS Vietnam, which was part of the multi-countries household survey of the ongoing Global Tobacco Sur- veillance System (GTSS) (11). The GATS in Vietnam was designed as a nationally representative survey of all non- institutionalized men and women aged 15 and older, with their primary residence in Vietnam.

A total of 11,142 households were selected using a two- phase sampling design analogous to a three-stage strati- fied cluster sampling. In 2009, the General Statistics Office (GSO) in Vietnam conducted a population and housing census. Meanwhile, GSO prepared a 15% master sample to serve as a future national survey-sampling frame. The 15% master sample contains a subset of enumeration areas (EAs) that consist of 15% of the population in Vietnam stratified into three groups. The first group consists of 132 districts, towns, or cities of provinces. The second group consists of 294 plain and coastal districts. The third group consists of 256 mountainous and island districts. The GATS sample was drawn from the 15% master sample after further stratification of the three groups into urban and rural areas (six strata in total).

At the first stage of sampling, the primary sampling unit (PSU) was EAs. The sampling frame was a list of the EAs, from the 15% master sample, with the number of households as well as identifiable information, admi- nistered by the GSO Vietnam in 2009 from the census. For each of the six strata, the designated number of EAs was selected. A selection probability proportional to size (PPS) sampling method was used, where the size was the selection probability of an EA using PPS sampling from the entire target population divided by the selection probability of an EA for the master sample.

At the second stage of sampling, 18 households from the selected urban EAs and 16 households from the selected rural EAs were chosen using simple systematic random sampling. One eligible household member from each selected household was then randomly chosen for an interview.

Note that the current design and the design where EAs were sampled directly universally were analogous. The selection probability of an eligible individual was calculated as a product of selection probability for each stage. The sampling base weight for an eligible individual was the inverse of the selection probability shown above.

2.2. Data collection

Handheld computers (iPAQ) were used for collecting data. Interviewers and supervisors from GSO conducted field- work, under the co-supervision of the WHO in Vietnam and Hanoi Medical University. The fieldwork lasted from March 22, 2010, to May 13, 2010, in all 63 provinces of Vietnam. The interviewers and supervisors were experi- enced, trained in using computers and handheld (iPAQ)

devices, and had previous experience working with local authorities, which is key to minimizing non-response rates. A case file containing addresses and names of the house- holds assigned to the interviewer was preloaded in the iPAQ prior to the fieldwork. The data collectors went to the residences of the respondents and met the head of the household to acquire general information about the number of eligible individuals in the household. This number was entered into the handheld computer and one individual was automatically selected to be interviewed. All responses were entered in the iPAQ.

2.3. Variables and definition used in this article

**** Dependent variables:***

- Knowledge of specific diseases of active smoking defined by one who answered 'yes' to all four situations (smoking causes serious illness, stroke, heart attack, and lung cancer)

- Knowledge of health consequences of secondhand smoke defined by one answered 'yes' to question 'breathing other people's smoke cause serious illness in non-smokers'.

**** Independent variables:***

- Smoking status: current smokers and current non- smokers

- Demographic variables: age; sex; education, quintile of household income which is based on the current study; area (urban/rural); region (ecological area), ethnic group

- Access to positive information channel in the last 30 days (Answer 'yes' to one of the following: informa- tion about health consequences of smoking, encour- agement to quit, or health warnings on cigarette packages)

- Access to negative information channel in the last 30 days (Answer 'yes' to one of the following: cigarette advertisement through media, cigarette advertisement events, or cigarette promotion).

**** Statistics:***

Descriptive and statistical analyses with percentages and 95% confidence interval (CI) were calculated using Stata 10 software (Stata Corporation). The relationship between demographic variables (sex, areas, education, age group, quintiles of income, regions), smoking status, and levels of access to information and knowledge of health consequences were conducted. Multivariate logis- tic regression modeling was performed to identify what variables associated with knowledge of health conse- quences of active smoking and passive smoking in which variables of demographic characteristics, smoking status, rule of 'no smoking at home' and levels of access to information were screened for bivariate association and then all entered into the model as the independent factors. Backward elimination was used to remove ones that were not statistically significant (p >0.05). The odds ratio (OR) with 95% CI was used. Sampling weights were used in all of the computations.

III. RESULTS

The household response rate was 96.9% and was a little higher in rural areas than that in urban areas (97.5 and 96.5%, respectively). The individual response rate was 95.7% and was also a little higher in rural areas than that in urban areas (96.3 and 95.0%, respectively). Overall, 0.6% of the households and 0.6% of the selected

individuals refused to respond to the survey. The total response rate was 92.7% (93.9% in rural areas and 91.7% in urban sites).

Among 9,925 completed interviews of adults aged 15 and above, two-thirds were living in rural areas. People aged 25-44 made up the largest proportion (41.9%). The educational level that predominated was secondary school (52.5%), followed by primary or less (26%), while college degree or above was only 7.2% of the total. The main occupation of the study population was farmers (49.6%), followed by service/sales (19.2%) and produc- tion/driving (12.9%). By ethnicity, 84.5% were Kinh people, and the remaining 15.5% belonged to other ethnic groups. By marital status, 67.7% of the total was married, 26.2% were single, and the remaining 6.2% were separated/divorced/widowed (Table 1).

Generally, the percentage of adults who agreed that active smoking and exposure to secondhand smoke causes serious illness were at high levels (93.4 and 83.8%, respectively) but differed by demographic characteristics. Regarding knowledge of harmful health effects of active and passive smoking, adults living in urban areas were more knowledgeable than those living in rural areas (97.1 vs 92.1% and 90.8 vs 81.3%, respectively); Kinh ethnic had greater knowledge than non-Kinh ethnic (96.8 vs 84.3% and 88.2 vs 72.0%, respectively). The respondents who had higher income and education were more likely to have better knowledge than those who had not. There were no differences for knowledge of health damage by sex, age group, and ecological region (Table 2).

Table 1. Distribution of adults ≥ 15 years by selected demographic characteristics - Viet Nam GATS, 2010

Weighted			
Demographic characteristics	**Percentage (95% CI*)**	**Number of adults (in thousands)**	**Unweighd number of adults**
Overall	100	64,321	9,925
Gender			
Male	48.6 (47.3-49.9)	31,259	4,356
Female Age (years)	51.4 (50.1-52.7)	33.063	5,569
15-24	25.9 (24.6-27.2)	16,637	1,656
25-44	41.9 (40.6-43.2)	26,944	4,251
45-64	23.4 (22.4-24.5)	15,065	2,886
65+	8.8 (8.2-9.5)	5,675	1,132
Residene			
Urban	30.7 (30.0-31.4)	19,725	4,958
Rural	69.3 (68.6-70.0)	44,596	4,967
Primary or less	26.0 (24.2 -27.8)	12.377	2.034
Lower secondary	52.5 (50.8-54.3)	25,031	3,981

Upper secondary	14.3 (13.1-15.5)	6,794	1,023
College or above	14.3 (13.1-15.5)	6,794	1,023

Table 2. Knowledge of health consequences of tobacco smoking by demographic characteristics

Demographic characteristics	Active smoking causes serious illness	Secondhand smoking causes serious illness
	Percentage (95% CI*)	Percentage (95%CI*)
Over all	93.4 (91.0-95.2)	83.8 (81.3-86.1)
Sex		
Male	93.7 (91.9-95.1)	84.3 (81.8-86.4)
Female	93.2 (89.9-95.4)	83.4 (80.3-86.1)
Residence		
Urban	97.1 (96.4-97.6)	90.8 (89.7-91.8)
Rural	92.1 (88.8-94.5)	81.3 (78.0-84.2)
Ethnic group		
Kinh	96.8 (96.1-97.3)	88.2 (87.0-89.2)
Other	84.3 (76.6-89.8)	72.0 (64.7-78.2)
Ecological regions		
Red River Delta	97.4 (96.6-98.0)	91.5 (90.2-92.7)
Northern midland and mountain	96.1 (94.6-97.2)	86.2 (82.9-88.9)
North Central area and Central coastal	97.1 (95.0-98.3)	92.6 (90.0-94.5)
Central highlands	98.0 (94.5-99.3)	93.0 (84.6-97.0)
South East	95.1 (93.8-96.2)	82.5 (80.0-84.8)
Mekong River Delta	88.6 (82.1-92.9)	78.9 (72.5-84.1)
Age groups		
15-24	93.9 (90.6-96.0)	89.7 (86.1-92.4)
25-34	93.7 (89.0-96.5)	85.0 (79.6-89.1)
35-44	94.0 (89.3-96.7)	84.6 (81.0-87.6)
45-54	95.6 (94.1-96.7)	87.0 (84.8-88.9)
55-64	93.5 (90.1-95.8)	79.1 (75.1-82.6)
>64	87.1 (83.7-89.9)	70.0 (66.1-73.6)
Incomes		
Quintile 1	85.3 (78.8-90.1)	69.6 (64.1-74.6)
Quintile 2	96.0 (94.5-97.1)	86.7 (84.1-89.0)
Quintile 3	96.9 (95.6-97.8)	88.9 (86.5-90.8)
Quintile 4	97.9 (97.0-98.6)	92.1 (90.6-93.4)
Quintile 5	97.7 (96.8-98.3)	94.8 (93.5-95.8)
Education		
Primary or less	84.5 (79.0-88.7)	64.6 (60.3-68.7)
Lower secondary	96.8 (95.4-97.8)	88.7 (86.6-90.5)

Upper secondary	98.2 (96.9-99.0)	95.0 (93.1-96.3)
College and/or above	99.1 (98.4-99.5)	97.1 (95.8-97.9)

However, only 51.5% of interviewees answered correctly to all three specific health consequences (stroke, heart attack, and lung cancer). The most common health consequence was lung cancer (95.8%), while strokes and heart attacks were found to be much lower (67.6 and 60.9%, respectively). Of interest, current smokers dis- played significantly lower knowledge of health risks of active smoking than current non-smokers, for example, smoking causes serious illness (83.3 vs 95.1%), stroke (59.4 vs 70.3%), heart attack (54.2 vs. 63.1%), lung cancer (93.0 vs 96.7%), all three main consequences (43.1 vs 54.3%), and secondhand smoke (77.3 vs 86.0%) (Table 3). There were significant differences in the knowledge of health consequences for those who have access to positive information and those who did not, with those having access to information having more knowledge of health consequences of active smoking than those who did not, for example, knowledge of: serious illness 96.2 vs 76.3%, stroke 71.8 vs 41.1%, heart attack 64.5 vs 37.9%, lung cancer 97.7 vs 83.4%, and all three main health consequences 55.5 vs 27.0%. This relationship held for individuals having access to information about second- hand smoke exposure; 87.9% of individuals with access knew that breathing other people's smoke can cause serious illness in non-smokers, while among adults with- out access only 59.0% knew about the consequences.

However, as demonstrated in Table 4, there were not many other differences between the groups. Education level was reported only among respondents aged 25 years with the assumption that at age of 25 and above, people have completed their education and have acquired knowledge and attitudes about tobacco use. Two models were constructed: (1) Model a: for all of the study subjects (all aged 15 years and above) education was excluded and (2) Model b: for those aged 25 years and above and education was included as an independent variable. Model a had similar results as model b. In this article, model b was presented in Table 5 of the results section while model a was presented in Table 6 in the appendix section. Multivariate logistic regression analysis indicated that after adjusting for demographic character- istics, accessibility to information, rule of 'no smoking at home', and smoking status, predictors of knowledge of health consequences of active smoking are education, ethnicity, access to information, and smoking status. Adults at lower secondary, upper secondary, and college or above were more likely to have significantly better knowledge of health consequences of active smoking than those at primary school (OR: 1.6, 1.7, and 1.9, respectively). It was also the case of knowledge on health consequences of secondhand smoke (OR: 2.4, 3.9, and 5.7, respectively). Adults belonging to non-Kinh ethnic had significantly lower knowledge of active and passive smoking-health risks than Kinh ethnic (OR: 0.7 and 0.4, respectively). This model also indicated that accessing positive information had significant association with knowledge of both active and passive smoking-health risks (OR: 2.3 and 1.9, respectively). Noticeably, current non-smokers have significantly better knowledge of active and passive smoking-health risks than current smokers

(OR: 1.6 and 1.7, respectively). Increasing age was positively related to knowledge of the health consequences of secondhand smoke (Table 5).

Table 3. Knowledge of health consequences of tobacco smoking by smoking status

Knowledge of health consequences of tobacco smoking	**Current smokers**	**Current non-smokers**	**Total**
Smoking causes	***Percentage (95% CI*)***	***Percentage (95% CI*)***	***Percentage (95% CI*)***
Serious illness	88.3 (82.8-92.2)	95.1 (93.6-96.3)	93.4 (91.0-95.2)
Stroke	59.4 (54.0-64.6)	70.3 (67.8-72.7)	67.6 (64.9-70.3)
Heart attack	54.2 (49.9-58.5)	63.1 (60.8-65.4)	60.9 (58.5-63.4)
Lung cancer	93.0 (89.9-95.2)	96.7 (95.8-97.3)	95.8 (94.6-96.7)
Stroke, heart attack, and lung cancer	43.1 (38.0-48.4)	54.3 (52.0-56.6)	51.5 (48.8-54.2)
Breathing other people's smoke cause serious illness in non-smokers	77.3(71.3-82.4)	86.0 (84.2-87.7)	83.8 (81.3-86.1)

Table 4. Knowledge of health consequences of tobacco smoking by different channels of accessing to information

Knowledge of health consequences of tobacco smoking	**Access to positive information**		**Access to negative information**	
	Percentage (95% CI*)		**Percentage (95% CI*)**	
Smoking causes	***No***	***Yes***	***No***	***Yes***
Serious illness	76.3 (67.5-83.3)	96.2 (94.9-97.2)	93.2 (90.9-94.9)	94.7 (90.1-97.2)
Stroke	41.1 (34.5-48.0)	71.8 (69.7-73.7)	66.5 (63.5-69.3)	75.1 (70.0-79.7)
Heart attack	37.9 (32.0-44.3)	64.5 (62.5-66.4)	59.6 (56.9-62.2)	69.6 (64.7-74.0)
Lung cancer	83.4 (77.7-87.9)	97.7 (97.1-98.1)	95.4 (94.1-96.5)	97.8 (96.6-98.6)
Stroke, heart attack, and lung cancer	27.0 (21.9-32.7)	55.5 (53.4-57.6)	50.1 (47.3-52.9)	60.0 (55.1-64.7)
Breathing other people's smoke cause serious illness in non-smokers	59.0 (52.0-65.6)	87.9 (86.0-89.6)	83.4 (80.9-85.6)	86.6 (82.2-90.0)

Table 5. Logistic regression analysis for factors associated with knowledge of health consequences of smoking (model b)

		Dependent variables			
		Knowledge on health risks of active smoking		Knowledge of health risks of secondhand smoking	
Independent variables	**Sub-categories**	**OR****	**95% CI***	**OR****	**95% CI***
Gender	Male	1			
	Female	0.9	0.8-1.1	1	0.7-1.4
Age group	25-34	1			
	35-44	0.9	0.7-1.2	2	1.5-2.7
	45-54	1	0.9-1.3	1.9	1.5-2.4
	55-64	1.2	1-1.5	2.2	1.6-2.9
	65 and above	1.3	1-1.6	1.3	1-1.7
2.6Education	Primary	1			
	Lower secondary	1.6	1.3-1.9	2.4	1.9-3
	Upper secondary	1.7	1.3-2.2	3.9	2.6-5.8
	College or above	1.9	1.4-2.5	5.7	3.7-8.6
Income	Quintile 5	1			
	Quintile 1	0.9	0.7-1.1	0.5	0.3-0.6
	Quintile 2	0.9	0.7-1.1	0.8	0.6-1.1
	Quintile 3	0.8	0.7-1	0.7	0.5-1
	Quintile 4	0.9	0.8-1.1	0.9	0.6-1.2
Ethnic	Kinh	1			
	Non - Kinh ethinc	0.7	0.5-0.8	0.4	0.3-0.6
Access to positive information	Yes	1			
		0.7	0.5-0.8	0.4	0.3-0.6
Access to negative information	Yes	1			
		2.3	2-2.6	1.9	1.6-2.3
Area	Urban	1			

		Dependent variables			
		Knowledge on health risks of active smoking		Knowledge of health risks of secondhand smoking	
Independent variables	**Sub-categories**	**OR****	**95% CI***	**OR****	**95% CI***
	Rural	1.1	1-1.3	1.1	0.9-1.3
Region	Red River Delta	1			
	Northern midland and mountain	1.2	0.9-1.5	1.9	1.2-3
	North Central area and Central coastal	1.2	1-1.4	1.1	0.8-1.5
	Central highlands	1.2	0.8-1.7	1.2	0.7-2.1
	South East	1.1	0.9-1.4	0.8	0.6-1.1
	Mekong River Delta	0.9	0.7-1.1	0.5	0.4-0.7
Smoking status	Current smokers	1			
	Current non-smoker	1.6	1.3-1.9	1.7	1.1-2.5

Table 6. Logistic regression: factors associated with knowledge of health consequences of smoking (model a)

		Dependent variables			
		Knowledge on health risks of active smoking		Knowledge of health risks of secondhand smoking	
Independent variables	**Sub-categories**	**OR****	**95% CI***	**OR****	**95% CI***
Gender	Male	1			
	Female	0.8	0.7-1	0	0.5-1.1
Age group	25-34	1			
	35-44	0.8	0.6-1	3	2.2-4.1
	45-54	0.8	0.7-1.1	2.6	2-3.4
	55-64	1	0.8-1.2	3.1	2.3-4.1
	65 and above	0.7	0.5-0.9	1.7	1.2-2.2
2.6Education	Primary	1			

		Dependent variables			
		Knowledge on health risks of active smoking		Knowledge of health risks of secondhand smoking	
Independent variables	**Sub-categories**	**OR****	**95% CI***	**OR****	**95% CI***
	Lower secondary	1.6	1.3-1.9	2.4	1.9-3
	Upper secondary	1.7	1.3-2.2	3.9	2.6-5.8
	College or above	1.9	1.4-2.5	5.7	3.7-8.6
Income	Quintile 5	1			
	Quintile 1	0.7	0.6-0.9	0.3	0.2-0.4
	Quintile 2	0.8	0.6-1	0.5	0.4-0.7
	Quintile 3	0.8	0.6-0.9	0.5	0.4-0.7
	Quintile 4	0.9	0.7-1	0.7	0.5-1
Ethnic	Kinh	1			
	Non - Kinh ethinc	0.6	0.5-0.7	0.3	0.3-0.5
Access to positive information	No	1			
	Yes	2.4	2.1-2.8	2.2	1.8-2.6
Access to negative information	No	1			
	Yes	0.6	0.4-1.1	0.6	0.2-1.8
Area	Urban	1			
	Rural	1.1	0.9-1.5	1.8	1.1-2.9
Region	Red River Delta	1			
	Northern midland and mountain	1.2	0.9-1.5	1.8	1.1-2.9
	North Central area and Central coastal	1.2	1-1.4	1.1	0.8-1.5
	Central highlands	1.1	0.7-1.6	1	0.6-1.8
	South East	1	0.8-1.3	0.6	0.5-0.9
	Mekong River Delta	0.8	0.6-1	0.4	0.3-0.6
Regulation of 'no smoking at home'	No	1			
	Yes	1	0.8-1.3	0.8	0.6-1.2
Smoking status	Current smokers	1			

		Dependent variables			
		Knowledge on health risks of active smoking		Knowledge of health risks of secondhand smoking	
Independent variables	Sub-categories	OR**	95% CI*	OR**	95% CI*
	Current non-smoker	1.6	1.3-2	1.8	1.2-2.7

IV. DISCUSSION

This study found that although there was a high pro- portion among adults answering that active and second- hand smoking can cause serious illness (Table 1), only 51.5% of them understood that smoking can cause all three specific diseases (stroke, heart attack, and lung cancer) which were scientifically documented to have close relationships with smoking (Table 2) (12, 13). The finding that the risk of lung cancer was most frequently reported is consistent with other findings about the causes of disease reported by adults, even though heart disease is the number one killer of smokers (14).

The difference in knowledge between current smokers and current non-smokers was also studied elsewhere. Yang et al. found in the 2010 GATS China that current smokers were aware of fewer health effects of smoking than current non-smokers, respectively. For individual health effects, only 68% of current smokers agreed that smoking causes lung cancer in smokers while among current non-smokers, the percentage is more than 90%. In addition, only 36% of current smokers agreed that smoking causes coronary heart diseases while among current non-smokers the percentage is over 50% (15). The difference in knowledge of health risk between smokers and non-smokers is similar to patterns observed in China and Western countries, where smokers systematically underestimated their personal risks from smoking, pre- sumably in an attempt to minimize cognitive dissonance from smoking and shield themselves from worry (16-18). Regarding differences in knowledge between Kinh ethnic and non-Kinh ethnic, the 2002 Vietnamese national health survey indicated that non-Kinh ethnic groups are people living in rural areas with lower levels of education than those living in urban areas (19), and a World Bank survey indicated that 90% of the poor in Vietnam live in the rural areas (20). 'This has resulted in significant educational challenges', as said by the Vice General Director of the Department of Sports, Entertainment and Economic Information at Viet Nam Television (VTV). In addition, in a very recent household survey in Vietnam conducted in 2011, it indicated that people at low education levels were more likely to smoke (21). This is where the IEC can play an important role in preventing smoking. Chee Ruey Hsieh in his study on knowledge of health risks in anti-smoking campaigns found that anti-smoking campaigns had a significantly positive effect on the public health-related knowledge (22). The Centers for Disease Control (CDC)'s best practice guidelines suggested that public education is an

integral part in the efforts to both prevent initiation of tobacco use and to encourage tobacco cessation (23). This current study supports the importance of the ability to access informa- tion in both descriptive and multivariate analyses. Those accessing information of the health harms of active and secondhand smoking were 2.3 and 1.9 times, respectively, more likely to have more knowledge than those who did not. Returning to the first major model for communication in 1949 by Claude Elwood Shannon and Warren Weaver, the process of communication was broken down into eight discrete components, that is, information source, message, transmitter, signal, channel, noise, receiver, and destination. The current study has identified three out of eight components of this model that should be carefully considered when developing and carrying out an IEC program for tobacco control conducted in Vietnam.

First, by indicating that an understanding about specific health risks related to tobacco smoking among Vietnamese adults, especially among current smokers and non-Kinh ethnic, may still not be specific, this study can help inform IEC programs designed to prevent tobacco smoking; messages should be designed to be scientifically credible, comprehensive, and consistent for the nation as a whole. Second, by indicating that current smokers and non-Kinh ethnic groups have lower levels of knowledge than other groups, it may be necessary to target messages to individual population subgroups. Third, by indicating that access to positive information is predictive of knowledge, this current study highlights the importance of coverage of an IEC program. This issue is specially concerned in Vietnamese context because the GATS 2010 indicated that, percentage of population accessing to mass media was still very low (32.8%) and that accessing to health warnings on cigarette packets among current smokers was only 14% and among general population was only 12.7% (24).

Therefore, in terms of policy implication, it is necessary to develop a national IEC program for preventing smok- ing tobacco which would be designed for different target groups of adults, including a general one, smokers, and non-Kinh ethnic groups in which clear and comprehen- sive messages/images about the health harm of tobacco smoking is conveyed appropriately and efficiently by different channels/modes to local-specific cultures.

V. CONCLUSION

The 2010 GATS in Vietnam showed that adults' knowl- edge of specific diseases related to tobacco smoking was still vague as reflected in only 51.5% adults knowing that smoking can cause all three diseases of stroke, heart attack, and lung cancer. Regarding knowledge of health harms of active and passive smoking, current non- smokers were 1.6-1.7 times likely to have better knowl- edge than current smokers, respectively; non-Kinh ethnic groups were less likely to have knowledge (OR=0.7 and 0.4, respectively) than Kinh ethnic group smokers. Accessing positive information had a close association with knowledge of smoking-health risks (OR=2.3 and 1.9, respectively, with *p* B0.001). The more education adults had, the better knowledge of health

consequences of tobacco smoking they got. Increasing age was posi- tively related to knowledge of the health consequences of secondhand smoke.

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RÉSUMÉ:

CONNAISSANCE DES CONSÉQUENCES NÉFASTES DU TABAC: UNE ÉTUDE CROSS-SECTIONNELLE CHEZ LES ADULTES VIETNAMIENS

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Etat actuel: Malgré des efforts considérables ont été déployés pour interrompre le tabac au Vietnam, en 2010 le Global Aldult Tobacco Survey (GATS) révéla 47.4% d'adultes mâles fument, une proportion élevée.

Objectifs: Déterminer le niveau et les caractéristiques de la connaissance des conséquence néfastes du tabac chez les adultes Vietnamiens.

Structure: GATS a été concue pour étudier un échantillon représentatif a l'échelle nationale d'hommes et de femmes Vietnamiens âgés de 15 ans et plus, venus de 11,142 familles utilisant un modèle à deux étages. Les statistiques descriptives ont été calculées et la régression logistique a été utilisée pour l'étude des associations entre les facteurs d'exposition supposés (âge, éducation, accès à l'information, groupe ethnique etc.) et connaissance des risques à la santé.

Résultat: La connaissance générale requise sur les risques sur la santé de la fummée "active" (FA), et de la fummée "passive" (FP) est bonne (90% et 83% respectivement). Cependant, la connaissance précise relative à la fummée du tabac (ictus, attaque cardiaque, et cancer du poumon) parait moins bonne (51.5%). Les non-fumeurs avaient une plus grande tendance à montrer une meilleure connaissance sur les risques à la sante de la fumée active (OR 1.6) et de la fumée passive (OR 1.7) que les fumeurs. Les adultes avec éducation secondaire, éducation de collège, ou plus élevée, avaient aussi une meilleure connaissance des risques sur la santé de la FA/FP que ceux avec éducation primaire. (FA: OR 1.6, 1.7 et 1.9 respectivement, et FP: OR 2.4, 3.9 et 5.7 respectivement). L'association est positive avec l'augmentation en âge concernant les conséquences sur la santé de la fumée passive et l'accès aux informations est liée positivement àla connaissance des risques sur la santé de la FA/FP (OR 2.3 et 1.9 respectivement). Autrement dit, les groupe ethniques non Kinh ont moins de connaissance sur les risques de la FA/FP que les goupes Kinh.

Conclusions: Il serait nécessaire de cibler les programmes de prévention du tabac aux sous groupes spécifiques, comprenant les fumeurs actuels, les adultes peu éduqués, les ethnies non Kinh, pour promouvoir leur connaissances sur les risques de la fumée sur la santé. Des messages compréhensibles et/ou images de maladies relatives à la FA/FP devraient être envoyés à la population générale par des canaux et modes approriés aux cultures spécifiques pour promouvoir la connaissance sur les conséquences néfastes de la fumée.

Mots clés: *Knowledge, smoking.*

STATUS OF THE ORGANIZATION OF MEDICAL EXAMINATION FOR PRISONERS IN SOME HOSPITALS, 2009-2010

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ABSTRACT

Objectives: Evaluate the status and needs of medical examination of prisoners in 26 hospitals. **Subjects and Methods:** The medical examination for workers at 26 hospitals. The medical staffs are working at the hospital directly involved in health care for prisoners. The prisoners had been staying away from the hospital. The study was designed by the method described. **Results:** The total of medical visits in the hospital for 2 years from 2009 to 2010: 67, 137 respectively; treatment: 8,364 respectively; death: 886 person. The proportion of prisoners with HIV/AIDS is very high (48.16% & 51.76%), the rate of TB infection (18.43% & 23.71%). Total of beds dedicated personnel at the hospital had 497/8.780 (5.66%). Accordingly, a police hospital bed for about 20-24; Hospital province/Hospital city about 22-24 beds; district hospitals, specialists spend about 10-12 beds for the treatment of prisoners. In accordance with technical distribution of Ministry of Health: 80.7% qualified hospital diagnosis and treatment, 19.3% can not afford hospital diagnosis and treatment of the patient should be moved to higher level above. There are 22/26 hospitals comply with the 1, 4/26 follow hospital procedure 2. There are 19/26 arrangement hospital dedicated treatment rooms for prisoners; 4/26 hospital arranged to have extra room, 3/26 hospitals share a room with other patients, 26/26 hospitals had implementation of hospital treatment required expertise. **Conclusions:** At present, there is no end of the line for the treatment of prisoners. So, when infected prisoners beyond the expertise of the clinic will be transferred to the state hospital in the area to tolerate, treatment. Therefore, the need for tertiary health care for prisoners.

Keywords: *Prisoners; dedicated treatment area.*

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I. BACKGROUND

The management of health, health care for prisoners is a humanitarian policy of the Party and State [7]. In recent years, the situation of crime, social ills are on the rise, the number of prisoners has increased each year tens of thousands of people were arrested at the prison, carrying out social disease on, while many prisoners were suffering from infections caused by prison conditions [4], [5], [9]. So, the situation of the prisoners illness is increasingly complicated, the number of drug addicts, diseases such as T.B, HIV/AIDS, hepatitis B, C, and sexually transmitted diseases....very high compared with the community [4], [8].

The prisons infirmary health service is responsible for the initial consultation and treatment for ordinary prisoners. On the other hand, the police hospitals often far from the prisons. So ill prisoners beyond the expertise of the clinic will be moved to the state hospitals in the area for health care [7].

Starting from the actual situation, we conducted research topic: "Situation of organization health care for inmates at a number of hospitals, 2009-2010", with two goals:

1. Demand for medical examination of the prisoner at 26 hospitals.

2. Status of organization health care for inmates at the hospital.

II. SUBJECTS AND METHODS

2.1. Object, location and time study

- Subjects of study:

+ The work of health care to prisoners in 26 hospitals studied.

+ The medical staffs are working at the hospital directly involved in health care for inmates.

+ The prisoners are away from the hospitals.

- Research Location: At 26 hospitals organized health care for inmates, including: 10 hospital provinces/cities; 6 police hospitals; 5 district hospitals; 5 specialized hospitals.

- Study period: 2009-2010.

2.2. Research Methodology

The study was designed by the method described.

2.2.1. Research methodology is described analysis

- Sample sizes: We choose 26 hospitals representing different regions of the country.

- A sample: We conducted a test on purpose.

- Criteria for sampling:

+ Selection criteria hospital province/city:

✓Organized clinics, treatment of prisoners.

✓There are 2 more prisons in the area.

✓Representing regions geographically.

+ Selection criteria for district hospitals:

✓Organized health care to prisoners.

✓Nearly detention facilities in the area (<20 km).

+ Selection criteria specialized hospitals:

✓Mainly hospital workers, HIV/AIDS often treat prisoners.

✓Having qualified professional diagnosis and treatment to meet the requirements of specialized hospitals (According to the Ministry of Health).

+ Selection criteria Police hospital:

✓The hospital organized health care to prisoners.

✓Representing regions.

2.2.3. Methods of analysis and data processing

The research results will be handled by biostatistical methods.

2.3. Research Ethics

- This is the study of the organization of the basic model for the treatment of prisoners at the hospital, in the research process and the results of the study did not affect the mission and activities of the prison and hospitals.

- The object of study on a voluntary basis, the information collected from individuals only for research purposes, is encrypted on your computer and confidential (secret).

III. RESULTS

3.1. Demand for medical examination of the prisoner at 26 hospitals

Table 3.1. Results for prisoner health care in 26 hospitals

Type hospital	Examination		Treatment		Mortality	
	2009	2010	2009	2010	2009	2010
Police	22.603	25.284	1.334	1.257	98	59
Province/City	1.317	1.346	1.053	1.149	191	191
District, specialty	2.369	14.218	1.796	1.775	185	162

Total	**26.289**	**40.848**	**4.183**	**4.181**	**474**	**412**

Comments: The total medical visits at hospitals in 2009-2010: 67 137 respectively; hospitalized; Total: 8,364 respectively, the total death toll: 886 people.

Table 3.2. Some common diseases of the prisoners

Type hospital	Tuberculosis (%)		HIV/AIDS (%)		Other diseases (%)	
	2009	2010	2009	2010	2009	2010
Police	9,10	8,90	51,20	49,81	39,70	41,29
Province/City	10,10	7,89	45,6	52,19	44,3	39,92
District, specialty	45,11	54,34	47,87	43,29	7,02	97,63
Total	**18,43**	**23,71**	**48,16**	**51,76**	**30,34**	**59,61**

Comments: The percentage of patients with T.B, HIV/AIDS and other diseases have increased over 02 years:

- Incidence of Tuberculosis: 2009: 18.4% and 2010: 23.71%; focused primarily on treatment in district hospitals and specialists.

- The prevalence of HIV/AIDS: 2009: 48.16% and 2010: 51.76%, this rate is relatively uniform in the line of treatment.

- The incidence of other diseases: 2009: 30.34% and 2010: 59.61%.

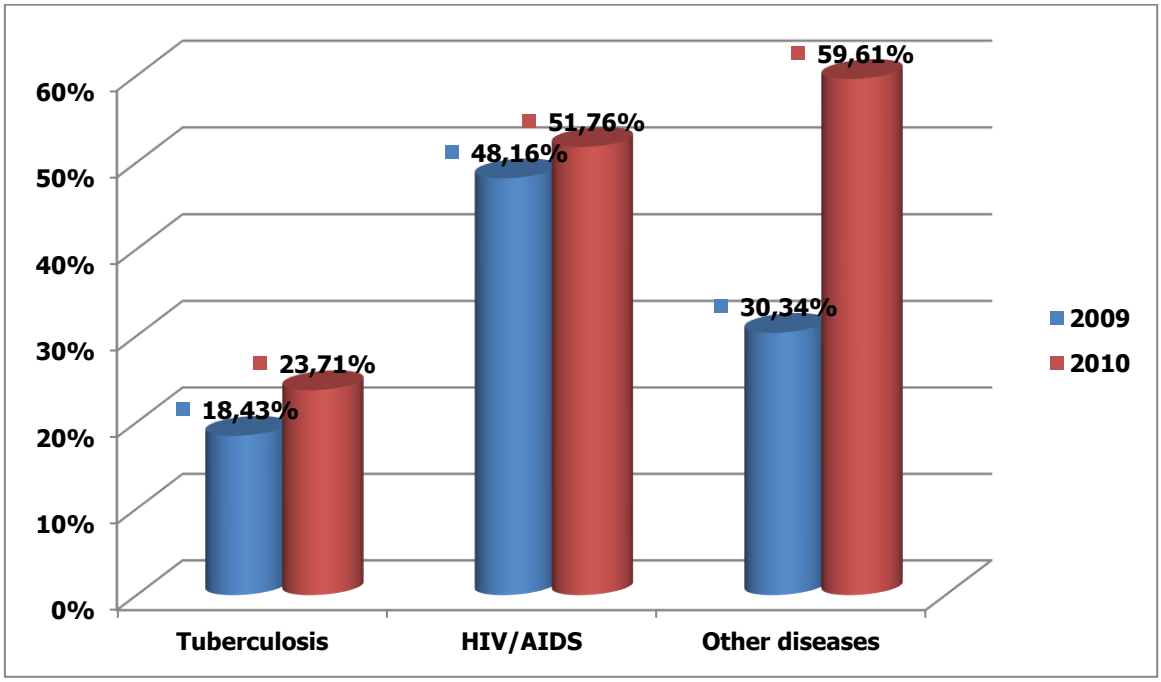

Chart 3.1. Illness mainly of prisoners

Comments: The proportion of prisoners with HIV/AIDS is very high (48.16% & 51.76%), then the rate of T,B infection (18.43% & 23.71%).

(Unit:%)

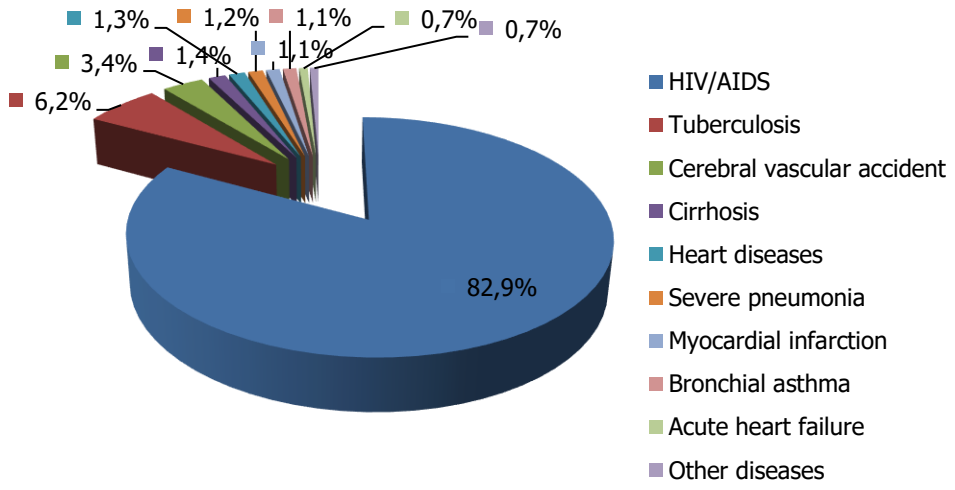

Chart 3.2. 10 causes of death of prisoner

Comments: The cause of death of the management, custody and education reform is HIV/AIDS (83.0%), T.B (6.2%), cerebral vascular accident (3,4%), other causes (0.7 to 1.4%).

3.2. Status of organization health care for prisoner the hospital

Table 3.3. The scale beds of hospital beds and hospital beds dedicated to the treatment of prisoners in hospitals

Type hospital	Total hospitals	The scale beds	Total beds dedicated for prisoners	Rate (%)
Police	6	1.770	143	8,07
Province/City	10	5.600	235	4,19
District, specialty	10	1.410	119	8,43
Total	**26**	**8.780**	**497**	**5,66**

Comments: Total of beds reserved for people at the hospital cactu is 497/8.780 (5.66%). Accordingly, a police hospital bed for about 20-24; Hospital province /city spends about 22-24 beds; district hospitals, specialists spend about 10-12 beds to treat prisoners.

Table 3.4. The ability to diagnose, treat of the hospital

Type hospital	Total hospitals	The ability to diagnose, treat of the hospital			
		Suffering		Higher referral	
		Total hospitals	Rate (%)	Total hospitals	Rate (%)
Police	6	3/6	50,0	3/6	50,0
Province/City	15	15/15	100,0	0	0
District, specialty	5	3/5	60,0	2/5	40,0
Total	**26**	**21/26**	**80,7**	**5/26**	**19,3**

Comments: According to technical decentralization of the Ministry of Health: 80.7% qualified hospital diagnosis and treatment, 19.3% can not afford hospital diagnosis and

treatment of disease should be moved the higher level.

Table 3.5. Technical ability of the hospital tests

Type hospital	Total hospitals	Technical ability of the hospital tests					
		Full range of specialists		Meet basic diagnosis, treatment		Laboratory testing of HIV/AIDS	
		Total hospitals	Rate (%)	Total hospitals	Rate (%)	Total hospitals	Rate (%)
Police	6	2/6	33,3	6/6	100,0	1/6	16,7
Province, City, specialty	15	14/15	93,3	15/15	100,0	8/15	53,3
District	5	0	0	3/5	60,0	0	0

Comments: According to technical distribution of Ministry of Health: Rate of hospital capable of fully testing specialist Hospital Police: 33.33%; Hospital provinces/cities, specialized science: 93.33%. Proportion of hospitals with the ability to meet basic tests are required to diagnose, treat: Police Hospital, hospital provinces/cities, specialist 100% of district hospitals: 60%. Proportion of hospitals have laboratories for HIV testing regulations: Police Hospital: 16.67%; hospital provinces/cities, specialty: 53.33%.

Table 3.6. Payroll staff in areas, treatment rooms dedicated to the prisoners at the hospital

Type Hospital	Total hospitals	Police staffing in hospitals	Total hospital medical staff in the room, separate	Total hospitals police
Police	6	3-5	0	6
Province/City	10	5-7	2	10
District, specialty	10	3-5	0	10

Comments: The hospital has officials, police and soldiers protecting the area dedicated treatment; 2 provincial hospital medical staffing in detention facilities in the district, dedicated treatment rooms.

Table 3.7. The infrastructure of the treatment room for the prisoners at the hospital

Type Hospital	Total hospitals	Total rooms	Total isolation rooms	Total beds
Police	1	50	5	143
Province/City	8	80	50	235
District, specialty	10	54	10	119
Total	**19**	**184**	**65**	**497**

Comments: The hospital has allocated 184 patients with 497 rooms and 65 bed isolation

room.

Table 3.8. The process of examination and treatment for inmates in hospital

Type Hospital	Quantities	Process 1	Process 2
Police	6	5	1
Province/City	10	8	2
District, specialty	10	9	1
Total	**26**	**22**	**4**

Comments: There are 22/26 hospitals comply with the 1, 4/26 follow hospital procedure 2.

Table 3.9. Organizing medical examination benhh for inmates at the hospital

Type Hospital	Total hospitals	There are regulations on health care for prisoners		The hospitals have dedicated treatment rooms for prisoners		The hospitals haven't dedicated treatment rooms for prisoners yet	
		Quantities	Rate (%)	Quantities	Rate (%)	Quantities	Rate (%)
Police	6	6/6	100	1/6	16,67	5/6	83,33
Province/City	10	10/10	100	8/10	80,00	2/10	20,00
District, specialty	10	10/10	100	10/10	100	0	0
Total	**26**	**26/26**	**100**	**19/26**	**73,07**	**7/26**	**26,93**

Comments: Regarding the provision of healthcare to prisoners: There are 26/26 hospitals accounted for 100% rate. Some hospitals have dedicated treatment room: 19/26 (73.07%) Number of hospitals without dedicated treatment rooms: 7/26 (26.93%).

Table 3.10. Room layout and treatment regimes healthcare for prisoners

Type Hospital	Total hospitals	To arrange a private room for the prisoners	Only when individual room layout departments excess room	The object lies with the hospital's patient	Examination of the modes prescribed in hospital	Examination requirements prescribed by the prisoner guard
Police	6	1/6	4/6	1/6	6/6	0
Province/City	10	8/10	0	2/10	10/10	0
District, specialty	10	10/10	0	0	10/10	0
Total	**26**	**19/26**	**4/26**	**3/26**	**26/26**	**0**

Comments: There are 19/26 arrangement hospital dedicated treatment rooms for the inmates; 4/26 hospital arranged to have extra room, 3/26 hospital inmates must share a room

with patients other, 26/26 hospitals made the treatment process expertise required.

IV. DISCUSSIONS

In recent years, morbidity, need examination and treatment of the prisoners is very large. Due to ill inmates from being caught in the community, particularly the rate of drug addiction, tuberculosis, HIV/AIDS and hepatitis B, C...is very high compared to the community (approximately 10-20 times) [4]. Tuberculosis is an infectious disease of the three highest causes of death in the world. According to WHO estimates, the global 2006, to 9.2 million people and 1.7 million new T.B cases died due to tuberculosis [6]. In the workshop on active T.B in prisons shows that inmates with more serious diseases, including tuberculosis notably, TB/HIV [4]. Moreover, captively cramped, crowded, working environment, rehabilitation, activities...are the risk factors for the spread of infectious diseases. Tuberculosis program regularly examination findings, treatment of subjects, in addition to the program media organizations, contest, end leaflets, propaganda posters used...

The inmates in prisons and detention centers and TB prevalence of HIV/AIDS together. The difference in the incidence of tuberculosis and HIV/AIDS in prisons and detention centers is due to the prison infirmary with the support of the TB program countries. Therefore, the number of inmates were found to be infected patients retain far more treatment. The detention program by not deploying the National Tuberculosis, jail time short term prisoners. Thus, the rate of detection and treatment of T.B volume less mass detention camp. Tuberculosis morbidity of the intervention, offenders in recent years, especially in increasing T.B-HIV, T.B incidence AFB (+) of offenders is higher than 8.8 times in the community, drug-resistant TB percentage of 6.8 % [1]. Thereby, the number of people arrested is very high, the situation is very complicated disease to manage health and health care for inmates focus on infectious diseases such as T.B, HIV/AIDS and drug addiction. Therefore, the deployment and effective implementation of the National T.B program, HIV/AIDS, drug addiction in prison is essential [3]. When inmates are transferred to a hospital surgical treatment of diseases, specialist, opportunistic infections, T.B and other serious diseases beyond demarcation of professional regulations, technical prison infirmary. With the demand for health care of prisoners is very high compared to the community.

According to the text content of the 4024/DTr on 05/25/1996 Therapy Department for the construction of separate rooms offender treatment in hospitals, the remaining prisoners, including suspects, detainees, students, detainees under the Ministry of Public Security management is not in the text guide [2]. Currently, police medical people in general did not meet the requirements of health care to prisoners; examination and treatment is mainly due to government hospitals to ensure patients are particularly specialized scientific, in-depth expertise beyond the prison infirmary. However, the technical guidance of the state hospital to the Health Ministry's direction. Therefore, necessary to build inter-ministerial Circular Health and the Ministry of Public Security health care for inmates at the state hospital.

V. CONCLUSIONS

- The demand for health care for the huge member of detainees; General prisoner health care in hospitals: in 2009 is 22 603 medical visits; 2010 is 25 284 medical visits. Total prisoners in hospital mortality in 2009-2010 was 886 cases.

- The structure of the prisoner's illness when health care is mainly hospital workers (from 9.1 to 45.11%), HIV / AIDS (43.29 to 51.2%), hepatitis B, C...

- Currently, there is no end to online treatment for prisoners. So, while the inmate disease beyond clinical expertise will be transferred to the state hospital in the area to tolerate, treatment. Therefore, the need for tertiary health care to prisoners.

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RÉSUMÉ:

STATUT DE L'ORGANISATION DE L'EXAMEN MÉDICAL POUR LES PRISONNIERS DANS CERTAINS HÔPITAUX, 2009-2010

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Objectifs: Evaluer la situation et les besoins en examens médical des détenus dans 26 hôpitaux.

Sujets et méthodes: L'examen médical pour les travailleurs de 26 hôpitaux. Les équipes médicales travaillent à l'hôpital directement impliqués dans les soins de santé pour les détenus. Les prisonniers avaient été de rester loin de l'hôpital. L' étude a été conçue par la méthode décrite croix.

Résultats: Le nombre total de visites médicales à l'hôpital pendant 2 ans de 2009 à 2010: 67 137 respectivement; traitement: 8,364 respectivement; mort: 886 personnes. La proportion de détenus vivant avec le HIV/AIDS est très élevé (48,16 % et 51,76 %), le taux d'infection de la tuberculose (18,43% et 23,71%). Total de lits dédiés au personnel de l'hôpital avait 497/8.780 (5,66 %). En conséquence, un lit de police de l'hôpital pendant environ 20-24; province/Hôpital de ville à environ 22-24 lits, les hôpitaux de district, les spécialistes de dépenser environ 10-12 lits pour le traitement des prisonniers. Conformément à la distribution technique de Ministère de la Santé: 80,7% diagnostic de l'hôpital qualifié et de traitement, 19,3% ne peut pas se permettre le diagnostic de l'hôpital et le traitement du patient devrait être déplacé à un niveau supérieur ci-dessus. Il ya 22/26 hôpitaux se conformer à l', la procédure de l'hôpital 1 4/26 suivi 2. Il ya 19/26 de l'hôpital arrangement dédié salles de soins pour les détenus; 4/26 l'hôpital arrangé pour avoir plus d'espace, 3/26 hôpitaux partagent une chambre avec d'autres patients, 26/26 hôpitaux avaient mise en œuvre d'un traitement hospitalier expertise nécessaire.

Conclusion: À l'heure actuelle, il n'y a pas de fin de la ligne pour le traitement des prisonniers. Ainsi, lorsque les détenus infectés au-delà de l'expertise de la clinique seront transférés à l'hôpital de l'Etat dans le domaine de tolérer le traitement. Par conséquent, le besoin de soins de santé tertiaires pour les prisonniers.

Mots-clés: *Prisonniers, espace de soins.*

COMPARISON OF CELLOPHANE TAPE AND BLUNT SCALPEL WET FOR THE DIAGNOSIS OF MALASSEZIA SPP. WITH NaOH WET MOUNT AND PARKER BLUE-BLACK INK IN VIET NAM

Tran Cam Van*, Nguyen Thi Tho*, Tran Kim Chi*,
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ABSTRACT

Objectives: Comparison the reliability of cellophane tape and blunt scalpel for diagnosis of Pityriasis versicolor with NaOH wet mount and Parker blue-black ink. ***Population and methods:*** 120 patients with Pityriasis versicolor and 80 healthy individuals are divided into 2 groups, group 1 uses cellophane tape, group 2 uses blunt scalpel. ***Results:*** Group 1 (Cellophane tape) had the time frame for returning results 45.0± 12.5 min, the rate of positive test 96.7%, the rate of positive test for scale lesions 50%, the high mount yeast (4+) 66,7%. Results of group 1 (cellophane tape) were higher than group 2 (blunt scalpel). ***Conclusion:*** The technique of collecting sample with cellophane tape is effective and safe to patients with Pityriasis versicolor.

Keyword: *Pityriasis versicolor, Malassezia, Yeast.*

I. INTRODUCTION

Malassezia spp are part of the normal cutaneous microflora of human and animal. Theis yeast was known since 150 years. It plays a role as causative pathogenic agent and surinfection in many skin diseases. Up to the present, there are 14 Malassezia species which are similar with structure, but different in biological characteristics and toxicity, so they are associated with several skin disease as pityriasis versicolor, seborrheic dermatitis, atopic dermatis, even systemic infection. Disease with Malassezia spp. have clinical symptoms such as: pruritus, macules, scale. Lesion can be seen at any part of body but it usually appears on part secernenting sebum such as head skin, back, chest and face.

Besides, it can be seen at hairfollicle, nail's surrounding area. Even micro-fungus enters organs, parts causing fungal infection of internal organs and fungemia.

Therefore, in poor examination condition, it can lead to misdiagnosis or simply cancel them. At National Hospital of Dermatology and Venereology, patients going to take examination and test finding fungus are numerous and diverse.

Every year, there are about 30,000,000 individuals taking examination and test finding fungus and positive rate is roughly 60%. According to Van Tran Cam et al (2012), infection rate of *Malassezia* in patients with PV is highest 1,48%, following is acrodermatitis 0,37% and the least is atopic dermatitis 0,28% in total number of patients going to take examination.

Dermatosis caused by *Malassezia* infection is not fatal but it causes much inconvenience and affects life quality of patients. Especially, if it is not treated immediately and properly, it will develop continuosly and become serious.

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In reality, the identification of fungus with direct examination is an important preliminary diagnosis step helps doctors compare clinical characteristics to instruct immediate treatment when not having enough test lab faclities. Within these, collecting disease sample is the first important step to make right examination about origin of disease. For dermatophyte, labs usually collect samples with blunt scalpel. This technique is quite effective in almost cases.However, when collecting sample with blunt scalpel sometimes causes younger children frightened and uncooperative with technician. Even, resulting in poor effectiveness in some lesion cases in special part of body such as face, productive organ.

Recently, at fungus lab-Department for Microbiology, Mycology and Parasitology at NHDV, we applied a technique collecting sample with cellophane tape to examine micro-yeast causing shallow fungal infection. This is a new technique, not widely applied in all cases of fungal infection. To better serve diagnosis and treatment for patients, we carried out this study:" *Comparison of cellophane tape and blunt scalpel wet for the diganosis of Malassezia spp. with NaOH wet mount and Parker blue-black ink*".

II. OBJECT AND STUDY METHOD

1. Study object

120 patients with PV and 80 healthy individuals were included in this study. Patients with PV were divided into 2 groups: groups 1 used cellophane tape, group 2 used blunt scalpel. Every patient was subjected to: skin pigmentation (white, brown, pink or mixed colors), anatomical sites (back, chest, belly, shoulder, neck, face); no use of antifungal drugs, no scaly skin; and no using drugs within 7 days ago. Healthy individuals group included post-graduate trainees and hospital's staff who had no skin diseases (examined and tested).

2. Study method.

- Study design: Comparing 2 methods
- Sample size of study:

❖For patients with PV group, caculated with clinical test formula by the World Health Organization (WHO):

$$n_1 = n_2 = \frac{\left\{Z_{1-\alpha/2}\sqrt{2P(1-P)} + Z_{\beta}\sqrt{P_1(1-P_1)+P_2(1-P_2)}\right\}^2}{(P_1-P_2)^2}$$

Among them $Z_{1-\alpha/2}$: 95% (= 1,96); Z_{β}: 80% (= 0,842); n_1: sample size of cellophane tape group; n_2: sample size of blunt scalpel group; P_1: positive test rate of cellophane tape group, estimated 90%; P_2: positive test rate of blunt scalpel group, estimated 70%; $P = (p_1+p_2)/2$; With $p_1 = 0,9$, $p_2 = 0,7$, sample size is calculated as $n_1 = n_2 = 40$. We selected 60 patients for each group of study.

❖For healthy individuals group, it is calculated as the below description.

$$n = Z^2_{1-\alpha/2} \times \frac{p(1-p)}{(p\varepsilon)^2}$$

Among them, n: sample size of healthy individuals group; p: *Malassezia* infection rate of healthy individuals, p= 0,85; ε: relative value (= 0,14); we calculated: n = 35. We selected 40 patients for each group of study.

3. Data processing

Data collection is processed with software SPSS 23.0 and medical statistical tests.

III. RESULT

Table 1. General characteristics of patients with PV

General characteristics		NaBI			
		Cellophane tape		Blunt scalpel	
		N	%	n	%
Age	0-9	6	10,0	4	6,7
	10-19	8	13,3	3	5,0
	20-29	21	35,0	26	43,3
	30-39	21	35,0	14	23,3
	40-49	3	5,0	9	15,0
	>50	1	1,7	4	6,7
	Total	60	100,0	60	100,0
	Average age X ± SD(min-max)	26,3 ±11,9 (1-68)		29,8 ± 12,6 (1-63)	
	P	>0,05			
Sex	Male	42	70,0	41	68,3
	Female	18	30,0	19	31,7
	Total	60	100,0	60	100,0
	P	>0,05			
Geography	Town	32	53,3	31	51,7
	Countryside	28	46,7	29	48,3
	Total	60	100,0	60	100,0
	P	>0,05			

Table 2. Comparing between cellophane tape and blunt scalpel method about time duration of giving test result, effect on body section, patients with PV

Characteristics		NaBI				p
		Cellophane tape		Blunt scalpel		
		n	%	n	%	
Time duration of giving test result						
< 30 mins		14	23,3	3	5,0	<0,001
30 - 60 mins		44	73,3	23	38,3	
60 - 90 mins		2	3,3	34	56,7	
Average time *X ± SD (min-max)*		45,0 ±12,5 (15-75)		66,0 ± 15,6 (30-90)		
Effect on scale involved						
Without scale	Positive	2	3,3	1	1,7	>0,05
	Negative	2	3,3	2	3,3	
Some scales	Positive	35	58,4	29	48,3	<0,05
	Negative	0	0	4	6,7	

Many scaless	Positive	21	35,0	24	40,0	>0,05
	Negative	0	0	0	0	
Total		60	100	60	100	--

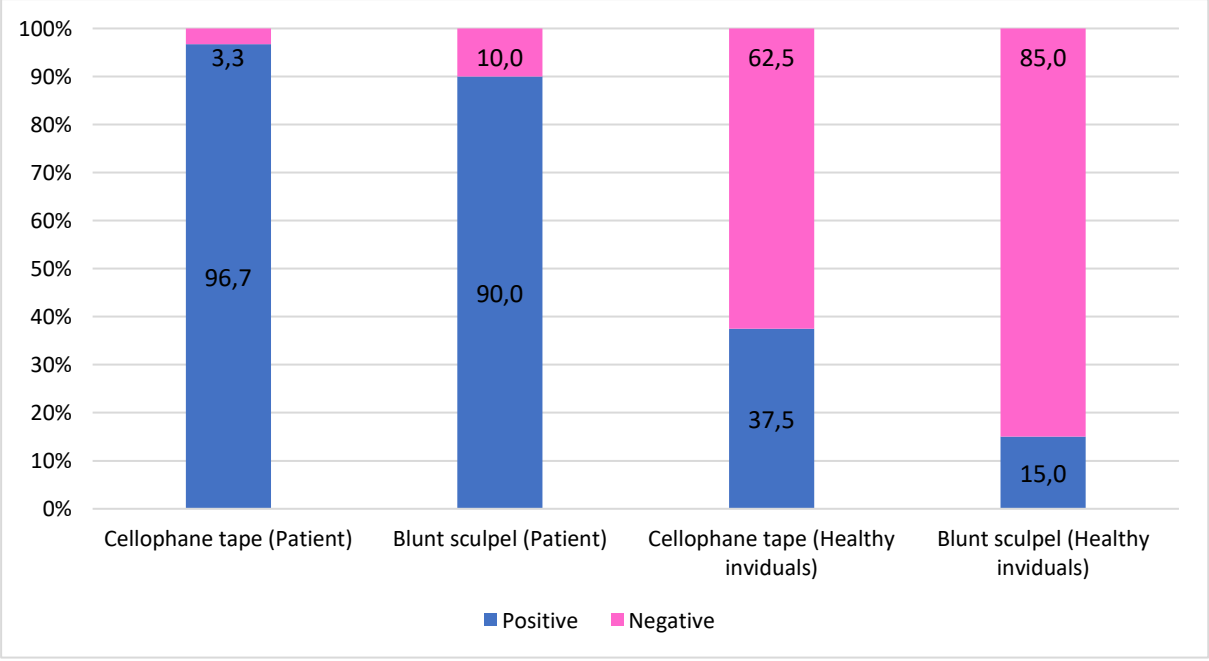

Figure 1. Test result of direct examination in cellophane tape group and blunt scalpel group in patients and individuals.

Table 3.Effect of cellophane tape and blunt scalpel method when judging the number of yeast cells in patients with PV and healthy individuals group.

Number of yeast cells	PV				Healthy individuals			
	Cellophane tape		Blunt scalpel		Cellophane tape		Blunt scalpel	
	n	%	n	%	N	%	n	%
Negative(0-3cells/object)	0	0	0	0	1	6,8	0	0
1+(3-10 cells/object)	0	0	0	0	7	46,6	2	33,3
2+(11-19 cells/object)	0	0	0	0	7	46,6	4	66,7
3+(20-39 cells/object)	2	33,3	3	75,0	0	0	0	0
4+(>40 cells/object)	4	66,7	1	25,0	0	0	0	0
Total	6	100	4	100	15	100	6	100

IV. DICUSSION

From July 2016 to November 2016, we selected 120 patients, divided them into 2 groups: group 1 included 60 patients with cellophane tape, group 2 included 60 patients with blunt scalpel. The result was similar according to age, sex, geography between 2 groups.We chose 80 healthy individuals and divided them into 2 groups: group 1 included 40 humans who take test with cellophane

tape and group 2 included 60 human with blunt scalpel.

Table 1 shows that average time giving result for cellophane tape group is 45,0 ± 12,5 (minute), faster than blunt scalpel 66,0 ± 15,6 (minute), p <0,001. Bruce Payle (1994) said that time duration giving test result of cellophane tape is faster than blunt scalpel from 5 to10 minutes[2]. However, in that study, author used chemical named Albert Toluidine in combination with cellophane tape method to compare with blunt scalpel method and standard KOH. Author Remya in a study in 2017 compared cellophane tape method and Pugh ink with blunt scalpel method and standard KOH, this time is from 4-5 minutes[3]. According to Navya (2017), when comparing cellophane tape and blunt scalpel method with the same KOH wet mount in examining PV, the time is from 15-20 minutes[4]. Our study result showed that cellophane tape is faster than blunt scalpel about 20-25 minutes. Because studies compare cellophane tape and blunt scalpel method, using the same KOH wet mount (Navya, 2017) or using 2 different wet mount (Bruce Payle, 1994 and Remya, 2017), we used the same NaOH wet mount in combination with Parker blue-black ink. NaOH is strong alkali substance, can absorbed into stratum corneum which is better than KOH. At the same period, combining with Parker blue-black ink-stain is favorable to *Malassezia*, shortening time duration of giving test and identify result. Maybe thank to this wet mount, our cellophane tape method is faster than blunt scalpel method is 30 minutes.

Therefore, we compared our result and many studied in the world. Diagnosis value of one examination technique was 96.7% of cellophane tape group positive, higher than blunt scalpel group 90.0%, the variance does not have statistical significance with p>0.05. This result was the same with Navya (2017), positive rate of cellophane tape and KOH is 96.4%, higher than blunt scalpel and KOH is 91.6%[4]. Particular, the author found 4.8% of cases using blunt scalpel negative while with this rate in cellophane tape is positive. Our result is lower than Hussein (2010), cellophane tape method has positive rate: 98%, blunt scalpel: 96% [5]; higher than Remya (2017), 2 methods have average rate: 89.3% [3]. We found that cellophane tape method has higher rate than blunt scalpel, the variance in rate among studies maybe due to different inks. Besides, combination rate between NaOH and Parker blue-black ink also affects study result. We will continue the improvement method to have the highest positive result in examining *Malassezia* from PV. In general, positive rate of cellophane tape as well as blunt scalpel method is above 90%.

PV is pathological signs of fungal infection on skin with characteristics: increasing scales and reducing pigmentation. To found the scales at lesions, we can use Wood lamp, this rate is usually 100%. In reality, we also observe cases without scale when observing with naked eyes. These cases can make us give wrong diagnosis of skin diseases which have other changing pigment such as vitiligo, melasma or pityriasis alba. Cellophane tape method showed that positive rate to lesion without scale is 50%, higher than blunt scalpel 33.3% (table 3). Although this variance does not have statistical significance due to too small sample size, we saw that cellophane tape is very useful for these cases without scale.

When comparing positive rate of lesions with few scales, we saw that a great variance,

100% cases in cellophane tape comparing with 87.8% in blunt scalpel positive to scales on lesions' surface. According to Hussein (2010), cellophane tape was helful with few scales and without scale in order not to omit diagnosis[5].

This also matches with Remya (2017) [3]. Maybe scale of PV is usually thin one, being easily scaled, using blunt scalpel sometimes misses lesions because of external factors such as wind, operation technique by technician.

In other hand, scale depends on many factors, within these: host factor is main pathology. For lesions with many scales, we found that both 2 methods have 100% positive rate. We assume that result by study team matches with real situation as well as pathogen of PV. *Malassezia* is a dimorphic micro-fungus having 2 main stages: yeast stage and hyphae stage. When the number of yeast cell grows in full quantity, *Malassezia* can cause PV. According to V. Silva (1996), the number of yeast cells is more than 20 cells/object, we could diagnosed PV.

Our study: 100% of cases has more than 20 yeast cells/object, within these, the number of micro-fungus is from 4+ for cellophane tape group 66.7% higher than blunt scalpel 25.0%(table 3).

Although, it is difficult to evaluate the number of micro-fungus, we saw that the number of yeast cells in PV lesion is quite great. Cellophane tape can maintain skin structure, therefore, it maintains micro-fungal density like skin. It results in calculating the number of micro-fungus more easily.

Nyvya (2017) also had similar conclusion when comparing cellophane tape method and blunt scalpel method in diagnosing PV [4]. We assume that the number of micro-fungus is very essential to confirm whether infection or not. If culture is considered as a golden standard to identify correctly origin of pathology, direct examination test is considereded as qualitative and semi-quantitative test. In some cases, direct examination test is considereded as a standard for treatment. Cellophane tape gives more accurate evaluation of number of yeast cells than blunt scalpel does. This also explains why rate of positive tests for cellophane tape is 96.7%, higher than blunt scalpel 90%.

Table 3 showed identification rate of yeast cell(typical structure) for cellophane tape group is 32.5%, higher than blunt scalpel group: 7.5%, variance has statistical significance with $p< 0,05$. Micro-yeast *Malassezia* causes opportunistic disease when the favorable condition serves. In healthy individuals's skin, they are micro fungi belonging to micro-flora with the main existence is yeast cell. According to Cabanes (2014), in healthy individuals' skin, microfungus *M. globosa* constantly exists under main structure: yeast cell[7].

Therefore,, our result achieved is similar to other studies. Maybe cellophane tape method only collects corneum peeled off without destroying other layers of skin like blunt scalpel. So identification rate of fungal cell hidden in horn cell for cellophane tape group, higher than blunt scalpel group. *Malassezia* is micro-yeast belonging to human skin and homolothermic animals. Accurate identification of number of yeast cells is an important step in diagnosing whether fungus can cause infection or not.

The result showed that rate of yeast cell 1+ for cellophane tape group: 46.6%, higher than blunt scalpel group: 33.3%. According to V. Silva (1996), the number of micro-fungus in human skin is usually <10

cells/object equivalent to level 1, within these, 90% of cases is yeast cells<3cells/object.

Therefore, author asummed when examining yeast cells <3cells/object and proving negative. Case from 3-10 cells/object maybe *Malassezia* develop into illness-causing stage. Moreover, a study carried out on Brazilian patient in Southern hemisphere where environmental and climatic condition is different from Viet Nam. Our study is carried out in Viet Nam, an region with tropical climate, where it is favorable to micro-fungus *Malassezia's* growth.

Our result showed that using blunt scalpel, the number of yeast cells is mostly from 2+ (66.7%), higher than cellophane tape. Because, yeast cell has similar structure to many other structures in skin, blunt scalpel upsets skin structure, therefore,, it makes technician difficult to identify yeast cell properly.

According to Trần Cẩm Vân and cs (2012), in healthy skin of patient with PV, acrodermatitis and atopic dermatitis, the average number of yeast cells is 2-3 cells/object [1]. We assume that, in healthy individuals volunteered in Viet Nam, the number of yeast cells is below 1+, it means below 10 cells/object.

In the future, it requires more comprehensive studies aimed at setting up a standard yeast cell examination criterion for direct examination test finding *Malassezia.*

V. CONCLUSION:

Therefore,, based on our findings results, we saw that the technique of using cellophane tape and NaOH in combination with Parker ink give faster test result and diagnosis for lesion with little scale. Simultaneously, the method also helps doctors better examine image of spawning and yeast cells and properly identify the number of yeast cells. The technique of collecting sample with cellophane tape is effective and safe to patients with PV. In the future, we need to study at larger scale with longer time and bigger sample size as well as to apply more advanced technique to properly identify the number of yeast cells causing disease.

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RÉSUMÉ:

COMPARAISON DES DEUX MÉTHODES: BANDE DE CELLOPHANE ET LE CÔTÉ OBTUS DU SCALPEL POUR LE DIAGNOSTIC DU PITYRIASIS VERSICOLOR AVEC LE NaOH HUMIDE ET L'ENCRE PARKER BLEU-NOIR AU VIETNAM

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Comparaison entre la fiabilité de la bande de cellophane et le côté obtus du scalpel pour le diagnostic du Pityriasis versicolor avec le NaOH humide et l'encre Parker bleu-noir au Vietnam.

Materiel et methode: 120 patients avec Pityriasis versicolor et 80 individus de bonne santé sont répartis en deux groupes, groupe 1 utilise la bande de cellophane, groupe 2 utilise le côté obtus du scalpel.

Résultats: Groupe 1 (bande de cellophane) avait le temps de retour 45.0±12.5min, celui pour la positivite étant 96.7%, et celui pour la peau calleuse étant 50%, le ferment monté (4+) 66.7%. Les résultats du groupe 1 (bande de cellophane) sont supérieurs au groupe 2 (côté obtus du scalpel).

Conclusion: La technique de la bande de cellophane est effective et dénuée de risque aux patients avec Pityriasis versicolor.

Mots clés: *Pityriasis versicolor, Malassezia, yeast.*

REMARKS ON TREATMENT RESULTS OF UNSTABLE FRACTURE OF THE PELVIC RING BY EXTERNAL FIXATION

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ABSTRACT

Objectives: Evaluate the treatment results of unstable fractures of the pelvic ring by external fixation method on the prevention of shock, the bony connection and rehabilitation. ***Material and methods:*** 71 patiens with unstable fractures of the pelvic ring were treated by external fixation in Hospital 103 and National Institute of Burns, from May 2010 to Feb 2017. Type B, C according to the classification of M. Tile. Prospective study of 49 patients and retrospective 22. External frame by the reversed pressed piles of professor Nguyen Van Nhan, four Ø 4,5mm Schanz pins are placed in the illiac crests. ***The early results:*** 69 patients became stable, out of shock (97%); 2 with shock unrecover and death due to injuries in the other body parts; reduction: Good 56 patients (78,9%), fair = 8 patients (11,3%), average: 4 patients (5,6%). Bad 3 (4,2%); the technique of fixation: achieved 100%; the time for skeletal recover and release the frame: 8,45 weeks. After fixation, the patients had less pain and could recover quickly. Therefore, they could avoid the complications due for long time lack of motion, it was very convenient for treating patients with combined lesions. ***The later results*** of 62 patients (87.32%),time of follow up: From 6 to 78 months, average 33,74 months.Good union of bone 62 patients (100%); results of rehabilitation: Good 52 patients (83,9%), fair: 3 patients (4,8%), average: 4 patients (6,5%). Less 3 (4,8%);. ***Conclusion:*** Treatment of unstable pelvic fracture by the The external fixation have good results, simple, easy, to fixed the skeletal fracture, reduce pain, stop bleeding, prevent shock,convenient for treating the patient.

Key word: *Unstable fractures of the pelvic ring; external fixation.*

I. INTRODUCTION

Pelvic facture is a common injury and usually is a severe injury. Melton (1981) statistics in 10 years (1968 - 1977) at Minnesota, reported 37 patiens / 100.000 persons / 1 year [5]. In Viet Nam, according to Ngo Bao Khang (1995) in Cho Ray hospital, pelvic facture ranged from 3 - 5% of total bones facture, often cause shock and high mortality rate, the second after the traumatic brain injury. The cause is mainly by traffic accidents [1].

The classic treatment for pelvic fracture is to allow the patient to lay motionless, to bandage around the pelvis, hang patient by a hammock, traction..., although it is simple and easy to perform. However, the results of recovery of anatomy are not high, fixation uncertain, patients have to remain motionless for a long time.

Internal fixation give better results of recovery of anatomy is the best, the patients can move early, avoid the complications of prolonged motionless, but it is a huge surgury, can not be donr in the emergency stages, and with open pelvic fractures.

Pelvic fractures cause a lot of blood loss, the patient is very painful, often shocked. Therefore, in the world and Vietnam there have been many surgeons using external fixed frames for emergency pelvic fracture

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treatment for the purpose of correcting and fixing fractures, preventing shock, facilitating the management of associate lesions and prophylaxis complications. Over the years, the Department of Orthopedic Trauma Hospital 103 has applied external fixation method by The reversed pressed piles of Nguyen Van Nhan to treat pelvic fractures and obtained very satisfactory results [2], [3], [4]. We study the subject *"Remarks on result of treament of unstable pelvic fracture by external fixation"* in order to:

1. Assess the result of treament of unstable pelvic fracture by external fixation on preventing shock, recoving skeletal fracture and funtion.

2. Giving some remarks about the assigning, technique and complications

II. MATERIALS AND METHOD

71 patients with unstable fractures of the pelvic ring were treated by external fixation in Hospital 103 and National Institute of Burns, from May 2010 to Feb 2017, aged: 12 to 71 (average:36), including 41 males and 30 females. All patients were treated assessed, caried for the results directly by us.

Causes of injuries: Mainly in traffic accident 39/71 patients (54.9%); falling in 20/71 patients (28.2%).

We used the classiphication of M. Tile (2003). There are 3 type lesions [6]:

- Type A: Stable fracture.
- Type B: Unstable fracture not completely (Unstable rotation, Stable vertically):

+ B1: Open book pelvic fracture (19 patients = 26.8%).

+ B2: Close book pelvic fracture (36 patients = 50,7%).

+ B3: Usually open book pelvic fractures (3 patients = 4,2%).

- Type C: Unstable fracture completely (Unstable rotation + vertically): C1, C2, C3 (13 patients = 18,3%).

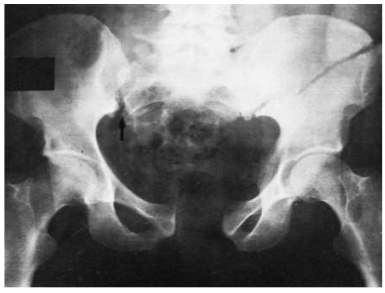


Figure 2.1. Open book pelvic fracture (type B1)

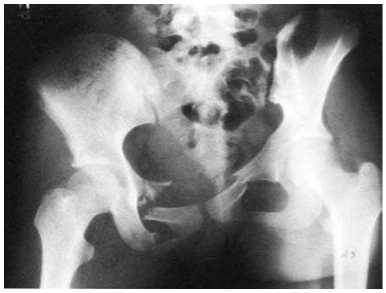


Figure 2.2. Close book pelvic fracture (type B2).

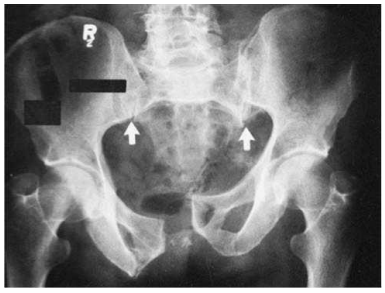


Figure 2.3. Bilateral Open book pelvic fracture (type B3).

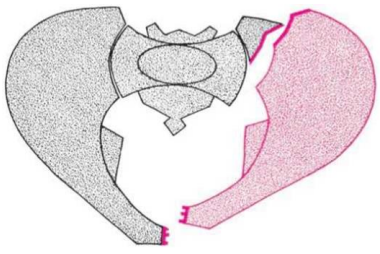


Figure 2.4. type C1 (unilateral type C).

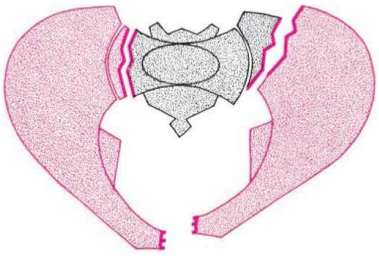


Figure 2.5. type C2 (one side type C, the other type B).

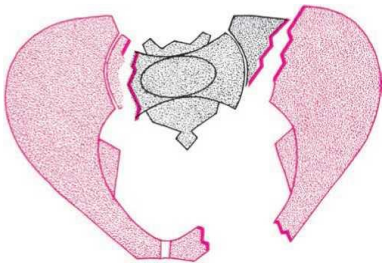


Figure 2.6. type C3 (bilateral type C).

Table 2.1. Unstable pelvic fractures of M. Tile (n = 71).

Classiphication	B1	B2	B3	C1	C2	C3
Patients	**19**	**36**	**3**	4	7	2
(%)	26,8%	50,7%	4,2%	5,6%	9,8%	4,2%

37 patients had shock (52.1%), in which: 20 patients (28.2%) were shocked but had stable treatment at the front hospital; 17 patients (23.9%) were shocked when they came to us (10 cases were treated stable then we made the external fixation, 7 emergency surgery to fixed external frame: 5 cases escape shock and become stable, 2 deaths from other organ diseases)

Associate lesions:

- 14 cases with brain injury (2 cases with brain trauma had surgry).
- 8 cases had closed abdominal trauma: (rupture of the rectum 3 cases, rupture of the small intestine 1 cases).
- 10 cases with large retroperitoneal hematoma.
- 8 cases with closed thoracic trauma.
- 12 cases with urology traumas: urethral rupture in men (2 cases); bladder rupture (4 cases); vaginal discharge (2 cases); muscul tissues wounds (4 cases).
- 42 cases with other bones or joints injury.
- 2 cases had burn: 1 electrical burn 17% head, face, neck, body. 1 gas burn 60% of face, neck, body, legs.

Methods

Retrospective research and continuous research of 71 patients (Continous research of 49 patients, retrospective research 22 patients).

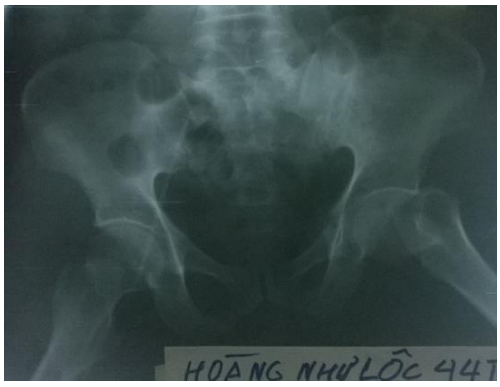
Instruments for external fixation.

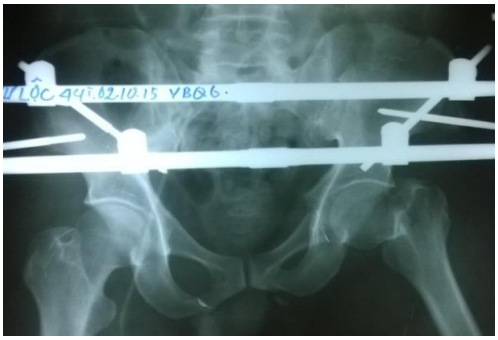
- 2 reversed pressed piles of Nguyen Van Nhan (35 cm length).
- 4 Schanz pins: Diameter 4,5 mm x 180 mm.
- Driller by hand and electrical driller, Diameter of drill= 3,5 mm and Schanz pin 4,5mm.

Anesthesia: In the hospital bed, local anesthesia at the drilling sites and piercing of Schanz pins, combined with systemic painkillers (Anesthetic is 2% Lidocaine + 0,5ml Adrenaline 0.1%).

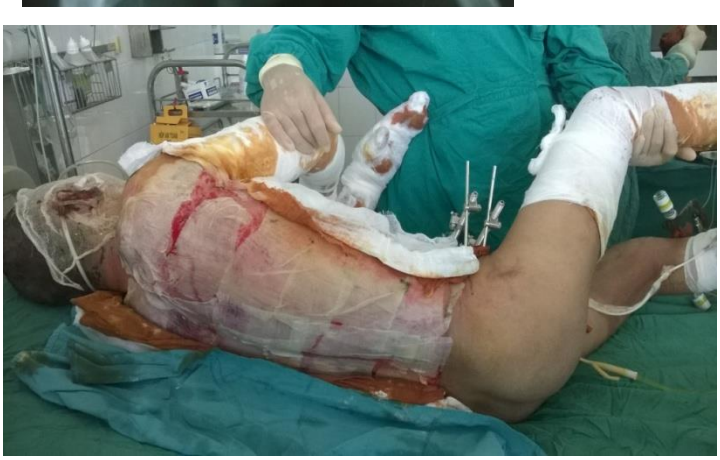
Technique: Drilling and caught 2 Schanz pins (diameter 4,5mm, length 180mm) into each iliac crest, distance between 2 pins is 4,5 cm. Installed the 2 reversed pressure piles linked the Schanzs, then linking two bars by two Steinman pins (Diameter 4,5 mm x 180 mm length) make the exteral fixation frame.

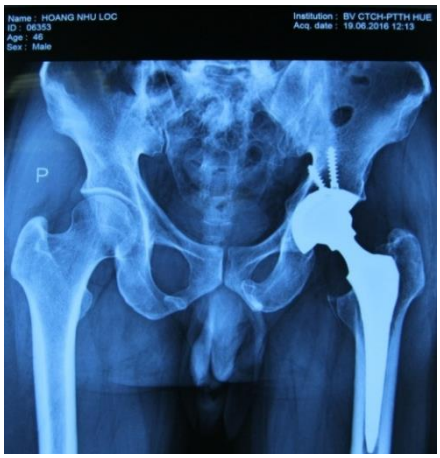
Use the wrench 10 to turn gradually, to press the surface of the broken bone or joints close together. X-ray when the patient's body stabilized to correct displacement of the bone fractures or joints if we feel needed.



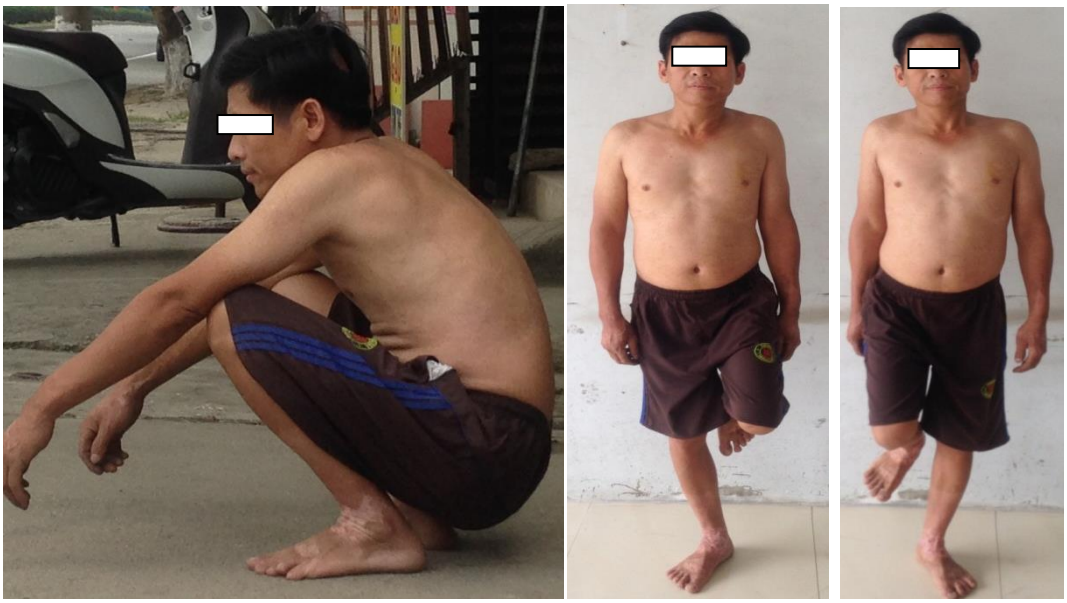


Figue 2.7. Pelvic fracture (left iliac fossa, left pubis, left femur neck) before and after fixation (images from the research).





Figue 2.8. Care for burn injuries and artificial hip replacement after external fixation (images from the research)



Figue 2.9. Two-years postoperative examination (images from the research)

Time of technical implementation: Immediately after the patient exits the shock or the patient is actively resuscitated but not released from shock; After the emergency surgery to manage the injury in the abdomen.

0-24 hours: 10 patients; > 24 - 72 hours: 28 patients; > 3-7 days: 19 patients; > 7 days: 14 patients. Some patients underwent late surgery due to the combination therapy in another hospital and then transferred to Hospital 103 and National Burn Institute for further treatment.

The time frame is 8-10 weeks.

Assessing:

- Early result: To base oneself on less pain, to prevent shock, the reduction, technique and complications.

- The late result: Evaluation of rehabilitation results according to the classification of Majeed S.A. (1989). Based on the analgesic effect, results of bone closed, the ability to walk, work and complications. Create a general classification table of 4 levels: Good, Fair, Average, Poor [9].

III. RESULS

****Early results***

17 patients (23.9%) hospitalized in shock, were treated for immediate shock, resulting in: 10 patients exits shock, surgery for other injuries and external fixation the pelvis; 7 patients with unstable blood pressure, emergency surgery to deal the causes of shock and external fixation: 5 patients to escape shock and gradually stabilize; One patient with deep coma was asked to return home and died, and one patient died of shock in hospital.

53 patients experienced pain relief in the pelvis immediately after external fixation. 16 patients (6 patients with abdominal surgery, 1 brain surgery, 9 patients with deep coma) after becoming conscious, had felt pain reduction.

X-ray examination after external fixation noticed that, the anatomical rehabilitation of pelvis of 64 patients were fair and at good level (90.2%), 4 patients had only average level (5.6%); 3 patients in poor level (4.2%): one patient with spinal column fracture, the second one with severe dislocation to hospital after 37 days of accident so difficult to correct, the other one with severe burns so the nurse usualy have to change the patient's posture to bandage and take care of burns damage the results of correction and fixation pelvis were affected.

The technique of fixation: achieved 100%

Convenient for taking care and treating the related injuries.

Schanz pins in the correct position, lying in the bone of the iliac crests.

The time for skeletal recover and release the frame: 8,45 weeks.

Complications of Schanz pins infection: 22 patients (31.0%), 51/276 pins (18,47%), infections must be treated (grade III): 8/51 pins (16%).

2. Later result

- Later examination: 62 patients (87,32%), 9 patients without later result (7 lost adress, 2 death)

- follow up: shortest is 6 months, longest 78 months, average: 33,74 months (Average 33,7 months).

- Rehabilitation: Good: 52 patients (83,9%); fair: 3 patients (4,8%); Average: 4 patients (6,5%), Poor: 3 patients (4,8%).

IV. DISCUSSION

About the indications

According to Tile, Letournel, Judet and Muller, choosing a treatment for patients with pelvic fractures must first be based on the patient's overall condition, pelvic fracture classification. M.Tile's classification is currently being used by many surgeons. For type A (A1, A2, A3) fractures, there are stable pelvic fractures, if there is no associated injury, the patient is immobile for 4 weeks. With type B fractures (B1, B2, B3) are unstable pelvic fractures (unstable rotation and stable vertical). With type C (C1, C2, C3), which completely unstable fractures (both rotation and vertical): Need to surgery to stabilize the pelvic bone, the reason we choose the method is:

First, this is a solid fixation method.

Simple technical operation, noninvasive and safe surgery. This can be done in the emergency room and early in the day after surgery.

The results of the treatment of patients with severe and complex injuries have escaped from shock, and good functional rehabilitation, demonstrating that our choice is correct. Long-term follow-up of 62 patients (87.32%), shortest was 6 months, the longest was 78 months, mean: 33.74 months.

Technique

Timing: We think it is a good idea to do it as soon as possible, as the important goal is to relieve pain and stop bleeding. Therefore, if patients with combined lesions need surgery, patients should be placed on the operating room and the pelvis fixed after closing the abdominal surgery. If the patient does not have intra-abdominal injury, he should be done so at the hospital bed and need to work early after excluding the abdominal emergency.

The position of Schanz pins: We chose the iliac crest to pierce through because this position is right under the skin, easy to do and not afraid of blood vessel damage, organ damage in the abdomen. Some authors also pierce the pins in the pubis, that creates better force for frame, but this technique requires drilling pins must be preventing injury of the organs.

First, drill through the pelvic shell by countersink (diameter 3,5mm), then use a hand drill to catch the pins. Make sure the pins are pierced to the iliac crest. When using a sharp pins, they can be pierced directly to the iliac crest and drill slowly. How to catch the pins in the middle of iliac crest, because if we drill through the side of the bony shell, the pins is no longer firmly attached to the bone. Normally after incision, we use the tip of pins to probe the thickness of the iliac crest before drilling and place the pins in the center.

We should place the frame 4-5 cm far from the skin of the abdominal is enough to care the abdominal incision, if any.

Why choose the reversed pressed piles: This is a frame that military doctors usually used, simple structure, solid fixation, which is available in military hospitals. Which can be used for many fractures, convenient for preservation, use in the frontline in combat conditions or mass rescue.

V. CONCLUSION

+ External fixation: simple, easy, to fixed the skeletal fracture, reduce pain, stop bleeding, prevent shock and treating the complex injuries

+ Convenient for taking care and treating patients and could avoid complications for the sick person lays motionless for a long time.

+ Later result of skeletal recover: 100%.

+ Recover funtion: Good: 52 patients (83,9%); fair: 3 patients (4,8%); Average: 4 patients (6,5%), Less: 3 patients (4,8%).

+ Pins infection: 22 patients (31.0%), 51/276 pins (18,47%), infections must be treated (grade III, IV): 8/51 pins (16%).

+ The period of external fixation: as soon as possible.

+ Assign: unstable pelvic fracture(type B, C - M. Tile classification).

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RÉSUMÉ:

REMARQUES SUR LES RÉSULTATS DU TRAITEMENNT DE LA FRACTURE INSTABLE DE LA CEINTURE DU PELVIS PAR FIXATION EXTERNE

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Pham Dang Ninh*, Nguyen Ba Ngoc*
** Université Militaire de Médecine*

Objectif: Evaluer les resultats du traitement des fractures instables de la ceinture du pelvis, par la méthode de fixation externe, dans la préventation du shock, la dislocation osseuse et pour la réhabilitation.

Matériel et méthode: 71 patients avec fractures instables de la ceinture du pelvis ont été traités par fixation externe à l’hôpital 103 et l’Institut National de brulures, de Mai 2010 à Février 2017. Type B, C, suivant la classification de M. Tile. L’étude a été prospective chez 49 patients, et rétrospective chez 22. Ont été utilisées les piles renversées du Professeur Nguyen Van Nhan, quatre epingles Schanz de diamètre 4.5mm sont placées au niveau des crêtes iliaques.

Les résultats immédiats: 69 patients ont été stabilisés, revenus de l'etat de shock, 2 ne sont pas revenus de l'état de shock, et sont morts par suite de blessures dans d'autres parties du corps; réduction: Bonne: 56 patients (78%), Satifaisante: 8 patients (11.3%), Moyenne: 4 patients (5.6%), Mauvaise: 3 patients (4.2%); la technique de fixation: Accomplie: 100%, le temps de guerison osseuse et de l'enlèvement de la plaque: 4.45 semaines. Après fixation, les patients souffrent moins, et la guérison a été plus rapide. Par conséquent, ils peuvent éviter des complications. La méthode est très bonne pour les patients avec blessures mixtes.

Les résultats tardifs: 62 patients (87.32%): temps de suivi: 6 à 78 mois, en moyenne: 33.74 mois, Bonne soudure osseuse: 62 patients (100%). Résultats de réhabilitation: Bon: 52 patients (83.9%), Satisfaisants: 3 patients (4.8%), Moyens: 4 patients (6.5%), Mauvais: 3 patients (4.8%).

Conclusion: Le traitement de la fracture instable de la ceinture du pelvis par fixation externe donne de bons résultats. Elle est simple, la fixation de la fracture osseuse est facile à réaliser, elle réduit la douleur, arrête l'hemorragie, évite le shock, et c'est donc une bonne méthode de traitement.

STUDY ON SPASTICITY IN PATIENT 3 MONTHS AFTER STROKE

Le Trung Duc*, Le Van Quan*,
Nguyen Van Phe**, Nguyen Duc Thuan*

ABSTRACT

Objectives*:** to identify the percentage of patients who develop spasticity 3 months after stroke and the relation between spasticity and initial clinical findings after acute stroke. ***Methods: In a prospective cohort study, 77 consecutive patients with clinical signs of central paresis due to a stroke were examined in the acute stage and 59 patients completed the reexamination 3 months later. At both times, the degree and pattern of paresis and muscle tone, the Barthel Index, modified Rankin Scale, were evaluated. Spasticity was assessed on the Modified Ashworth Scale and defined as Modified Ashworth Scale ≥ 1 in any of the examined joints. ***Results***: Fifty nine patients (76.6%) were reassessed after 3 months. Of these, 30.5% (n=18) had developed spasticity. Spasticity was seen in upper limb (100%), in lower limb (50%) and in both limbs (50%). Slight and mild spasticity was mostly observed in upper as well as lower limb. Severe spasticity defined as Modified Ashworth Scale ≥3 was not detected in the study. Regression analysis used to test the differences between upper and lower limbs showed that patients with more severe paresis in the proximal and distal limb muscles had a higher risk for developing spasticity ($p < 0.01$). Patients with spasticity showed a lower Barthel Index and higher modified Rankin score compared with the group without spasticity. ***Conclusions*:** Spasticity was present in 30.5% of patients with initial central paresis. Slight and mild spasticity was predominant. Predictors for the development of spasticity were a severe degree of paresis and lower Barthel Index and higher modified Rankin score.

***Key words**: Stroke, spasticity, paresis*

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I. INTRODUCTION

Stroke is considered as a major challenge in health care due to its high rate of prevalence, morbidity and disability. After stroke, a lot of early and late complications

may appear including physical and mental disorders, ex. paralysis, spasticity, aphasia, cognitive reduction, depression [1], [2]. Among those, spasticity is one of the most observed impairments with the prevalence ranging from 3 to 46% [3]. Spasticity is often associated with exaggerated reflexes and clonus. Spasticity is classified as a sign of upper motor neurone (UMN) syndrome, which is a clinical phenomenon observed after lesions of cortical motor areas or the corticofugal descending tracts [4]. If not exactly diagnosed and treated, it may cause pain, movement disorder, reducing of motor recovery process, bad affect on activity of daily life as well as poor quality of life of stroke patient [5]. Recently, it has been paid much attention worldwide but in Vietnam, little is known about its prevalence and correlation with other factors after stroke. For these reasons, this study was conducted to estimate the prevalence of spasticity, and to identify risk factors in the acute phase for spasticity 3 months after stroke.

II. METHODS

Population study: A total of 77 patients with diagnosis of stroke, admitted to Stroke Unit in Military Hospital 103 were eligible. The recruitment period was from October 2010 to April 2018. At 3 months after stroke, 59 patients with all data could follow the study.

Inclusion criteria: Patient with stroke diagnosed according to World Health Organization 1970, extremity paralysis at the examination time and consent to participate in the study

Exclusion criteria: Patient with other nervous system diseases, previous stroke with spasticity, consciousness disorder, other severe internal diseases, ex. End-phase heart failure, liver, kidney failure, severe pneumonia… or patient refused to participate in the study

Design: prospective cohort study

Procedure of the study: In a prospective cohort study, the procedure was conducted as the below:

At the first examination time (To): within 7 days after hospitalization, patients data were collected in term of the followings: Demographics, Neurological status according to National Institutes of Health Stroke Scale (NIHSS), Muscle power according to British Medical Research Council Scale (BMRC) [6], *Muscle tone according to modified Ashworth Scale (MAS)*. The modified Ashworth Scale is a 5-point ordinal scale with documented reliability. It scores from 0 to 4, with 0 indicating absence of spasticity and 4, severe spasticity. Spasticity defined as MAS score equal or greater 1 in any of the joints tested [7], activity of daily life according to Barthel Index (BI), disability status according to modified Rankin Scale (mRS).

At 3 months after stroke (T1): the stroke patients were similarly reassessed at the hospital or at home depending on their health condition. The data was collected by the same investigator at both times.

Statistical Analysis

Statistical analysis was carried out using SPSS version 20. All statistical tests were carried out at a 5% level of significance.

III. RESULTS AND DISCUSSION

3.1 Demographics and clinical manifestation of the study population

Table 1. Demographics of the study population at acute phase

Characteristics		Patient (n=77)	Prevalence (%)
Age, mean ± SD		65.3 ± 12.5	
Sex	Male	51	66.2
	Female	26	33.8
Occupation	Farmer	46	59.7
	Retire	20	26.0
	Others	11	14.3
Risk factors of stroke	Hypertension	53	68,8
	Previous stroke	23	29,9
	Diabetes	18	23,4
	Smoking	11	14,3
	Cardiac diseases	11	14,3
	Hyperlipidemia	6	7,8

In our study, the mean age of the population study was 65.3. Of those, age group 50-69 was dominant. The stroke patients with the age over 70 accounted for 90.9% (70/77). The result was similar to outcomes of the previous publication in which concluded that stroke mainly occurred in elderly people [1], [2], [9]. Among 77 patients, the male to female ratio was 2/1. N.V.Chuong, V.A.Nhi, Rathore have given the different rate, but they had a similar conclusion that man showed the higher rate of stroke than women [2], [8], [9].

In term of risk factors of stroke (see table 1), hypertension and previous stroke stood on the two highest positions with the prevalence of 68.8% and 29.9%, respectively. Our results were consistent with most studies on stroke, showing the prevalence of hypertension between 59.35 and 76% [1], [2], [8]. Other risk factors were seen with a high rate in a lot of previous publication about stroke in the last decades [2], [9].Only patients without existing spasticity which had not influence on the development of spasticity, could be included in the study.

Table 2: Clinical characteristics of the study population

Signs	Patient (n=77)	Prevalence (%)
Motor disorder	77	100
Cranial nerves disorder	51	66,2
Sensory disorder	27	35,1
Reflex disorder	16	20,8
Conscious disorder	12	15,6
Vestibular/ cerebellar syndrome	5	6,5
Bowel/ Blader disorder	4	5,2
Meningeal syndrome	3	3,9

Stroke causes a lot of neurological disorders divided into two groups: focal and general neurological sign. In the study, both two groups were observed in which motor disorders was at the first rank with 100%, the follow were cranial nerves, sensory, reflex and conscious disorder with 66.2%, 35.1%, 20.8% and 15.6%, respectively. The mentioned disorders were also seen with high proportion in other previous studies. N.V.Chuong studied 150 stroke patients and found that paralysis after stroke accounted

for 90.67%, central facial nerve palsy and conscious disorder were observed in 87.33% and 24.0% patients, respectively [2]. The similar results were reported in publication of N.V.Dang [1].

Table 3: Disability and activity of daily life of the study population at acute phase

		Patient (n=77)	Prevalence (%)
Modified Rankin Scale	1	24	31,2
	2	8	10,4
	3	13	16,9
	4	18	23,3
	5	14	18,2
Barthel Index	< 25	8	10.4
	25-64	35	45.4
	65-94	19	24.7
	>94	15	19.5

In the study, the patients with slight disability defined as mRS ≤ 2 accounted for 41.6% and the mean mRS score was 2.82 which meant a moderate disability. Regarding activity of daily life, 34 (44.2%) patients had slight or no difficulty in finishing their functional task of activity of daily life (BI ≥65) and the mean BI score was 57.6 which meant a moderate dependence. Because of different inclusion criteria and sample size, we found no study on stroke for comparison with our outcomes. Despite of this condition, we could recognize that after stroke almost patients had to receive support from care givers which meant that stroke caused a huge burden for not only the patient themselves but also their family and society [9]. World Health Organization also determined that stroke is the leading cause of disability in adult people worldwide.

3.2. Prevalence of spasticity and relation with other factors

Prevalence of spasticity: At 3 month after stroke, 18/59 (30.5%) patients developed spasticity in any joint and characteristics of spasticity showed in the table 4.

Table 4. Distribution of spasticity

		Patients with spasticity (n = 18)	
			Prevalence (%)
Distribution of spasticity	Upper limb	18	100
	Lower limb	9	50
	Both limbs	9	50
Upper limb (MAS grade)	0	0	0
	1	8	44.5
	1+	9	50.0
	2	1	5.5
	3 or 4	0	0
MAS (mean)	1.31±0.29		
Lower limb	0	9	50.0

(MAS grade)	1	1	5.5
	1+	7	38.5
	2	1	5.5
	3 or 4	0	0
MAS (mean)	0.75±0.77		

From the table 4, eighteen (100%) had spasticity in the upper limb, 9 (50%) in the lower limb and 9 (50%) had spasticity in both the upper and the lower limb. Most patients had mild spasticity, presented as MAS grade 1 or 1+. Prevalence of spasticity in the present study was higher than most studies on stroke. Sommerfeld et al. (2003) found 18/95 (18.9%) patients developed spasticity at 3 months after stroke [10]. In the Lundstrom's study (2009), at 12 months after stroke, spasticity was detected in 17% of patients. In a study of 95 patients with *stroke, prevalence of spasticity was 19%* for the entire group of patients [11]. Sixty four of the 95 patients had initial hemiparesis, and 18 (28%) developed spasticity 3 months later. In the recent study on 87 patients with subarachnoid hemorrhage, the 6-month poststroke prevalence of spasticity was reported to be 22% for all the patients. However, some studies reported higher prevalence, from 42.6% up to 46%. The reason for this difference may be due to differences in inclusion criteria or in the method of assessing spasticity. For example, Sommerfeld [10], Wallmark [12] included the stroke patients regardless of initial paresis. The time for reexamination in some studies was different. Urban investigated spasticity at 6 months after stroke while Opheim et al. [3] reassessed the patients within 12 months poststroke. Another explanation for this was the different sample size of each study.

In term of distribution of spasticity, our observation was similar to other previous studies that spasticity was detected in different joint of upper and lower limb. Slight, mild severity of spasticity was predominant in the present and previous researches [10], [12], [13].

Relation between spasticity and other variables

Table 5. Clinical characteristics of patients with and without spasticity

		Spasticity	**No spasticity**	**p-value**
Age	< 50, n (%)	2 (40)	3 (60)	0,63
	≥ 50, n (%)	16 (29.6)	38 (70.4)	
Age (mean)		69.11±13.57	63.27±11.44	0,094
Sex	Male, n (%)	9 (23.7)	29 (76.3)	0,126
	Female, n (%)	9 (42.9)	12 (57.1)	
Upper limb muscle power (BMRC)	Proximal (mean)	1.33±1.74	3.02±1.79	**0,001**
	Distal (mean)	1.39±1.72	2.88±1.61	**0,002**
Lower limb muscle power (BMRC)	Proximal (mean)	1.72±1.64	3.05±1,76	**0,009**
	Distal (mean)	1.72±1.64	3.05±1.67	**0,007**
Barthel Index (mean)		65.12±29.46	42.50±21.97	**0,002**
mRS (mean)		2.49±1.64	3.50±1.15	**0,009**

Similar to the findings reported by Lundstrom et al. [11], Wissel et al. [5] and Urban et al. [13], we did not identify an influence of sex and age on the occurrence of spasticity. We further analyzed the association between spasticity and risk factors, type as well as location of stroke and were able to demonstrate that there was no statistically significant difference in occurrence of spasticity in these groups. In addition, we found there was no relationship between clinical signs at acute phase and spasticity which reported in the study of Opheim et al. However, Urban et al. noticed that patients with hemihypesthesia are more often affected by spasticity of the upper and lower limb than are patients without sensory deficits. The reason for the findings could be difference in the method of sensation examination, number of population study or duration of patient observation.

In the present study, we noticed that patients in spasticity group had higher BMRC score than this in patients without spasticity for both proximal and distal upper and lower limb, which confirms previous observations. These findings strongly suggest the need for thorough follow-up and increased awareness of the development of spasticity in patients with severe paresis.

We were further able to demonstrate that the presence of spasticity had an impact on disability after stroke, as reflected in the mRS score, as well as on activities of daily living, as shown by the BI. The same findings were reported in studies of Wissel et al., Urban et al. and Opheim et al.

IV. CONCLUSION:

Study on 59 patients 3 months after stroke, we found that spasticity developed in 30.5% of all stroke patients. Spasticity in upper limb, lower limb and both limbs was 100%, 50% and 50%, respectively. Slight and mild spasticity was mostly observed in the patients. Severe spasticity was relatively rare. There was a relationship between spasticity and paresis severity, stroke disability reflected by modified Rankin Scale and activity of daily life represented in Barthel Index. However, spasticity did not associated with age, sex, risk factors of stroke as well as clinical manifestations. Risk factors for the development of spasticity 3 months after stroke was severe paresis, a lower Barthel Index and a higher modified Rankin score at acute phase.

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RÉSUMÉ:

ETUDE DE LA SPASTICITÉ CHEZ LE PATIENT 3 MOIS APRÈS L'ICTUS

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Objectifs: Identifier la proportion de patients progressant vers la spasticité 3 mois après l'ictus, et la relation entre la spasticité et les signes cliniques initiaux après l'ictus aigu.

Méthodes: Dans une étude prospective sur cohorte, 77 patients consécutifs avec signes cliniques de parésie centrale par suite de l'ictus ont été examinés, à l'état aigu, et 59 patients l'ont été 3 mois plus tard. Aux deux examens, l'intensité et le mode de parésie ainsi que la tonicité musculaire, l'index de Barthel, l'échelle de Rankin modifiée ont été évalués. La spasticité a été evaluée sur l'échelle modifiée d'Ashworth, définie comme l'échelle modifiée d'Ashworth ≥1 pour toutes les articulations examinées.

Résultats: Cinquante neuf patients (76.6%) ont été réexaminés après 3 mois, dont 30.5% (n=18) developaient une spasticité. La spasticité se retrouvait sur les membres supérieurs (100%), (50%) sur les membres inférieurs, et sur les membres supérieurs aussi qu'inférieurs (50%). La spasticité légère se retrouvait aussi bien aux membres supérieurs qu'inférieurs. La spasticité sévère definie sur l'échelle modifiée d'Ashworth ≥3 n'a pas été retrouvée. Une analyse par régression a été utilisée pour tester les différences entre membres supérieurs et inférieurs a montré que les patients avec parésie sérieuse des muscles de la partie proximale et distale des membres ont plus de risque de développer une spasticité ($p<0.01$). Les patients qui avaient développés la spasticité montraient un Index de Barthel moindre et un score modifié de Rankin plus élevé que chez ceux qui n'en avaient pas.

Conclusions: La spasticité se retrouvait chez 30.5% de patients avec parésie centrale. La spasticité légère était prédominante. Les signes précurseurs de la progression vers la spasticité étaient l'intensité de la parésie, un bas index de Barthel et un score modifié de Barthel élevé.

Mots clés: *Stroke (ictus), spasticity (spasticité), paresis (parésie).*

THE SUVmax IN THE DIFFERENTIATION BETWEEN LUNG METASTASES AND SYNCHRONOUS SECOND PRIMARY LUNG TUMOURS IN PATIENTS WITH NON-SMALL CELL LUNG CANCER

Huynh Quang Huy*

ABSTRACT

Purpose: In NSCLC patients with multiple lesions, the differentiation between metastases and second primary tumours has significant therapeutic and prognostic implications. The aim of this retrospective study was to investigate the potential of ^{18}F-FDG PET to discriminate metastatic disease from second primary lung tumours. **Methods:** Of 318 NSCLC patients between November 2015 and October 2018 at Bach Mai hospital, patients with a synchronous second primary lung cancer were selected. Patients with metastatic disease involving the lungs served as the control group. Maximum standardized uptake values (SUVs) measured with ^{18}F-FDG PET were determined for two tumours in each patient. The SUVmax was determined and compared between the second primary group and metastatic disease group. Receiver-operating characteristic (ROC) curve analysis was performed to determine the sensitivity and specificity of the SUVmax for an optimal cut-off value. **Results:** A total of 81 NSCLC patients (44 metastatic disease, 37 second primary cancer) were included for analysis. The SUVmax was significantly higher in patients with second primary cancer than in those with metastatic disease (7.53±4.33 vs 4.35±2.58, respectively, p<0.001). The area under the ROC curve was 0.81 and the odds ratio for the optimal cut-off was 7.52. **Conclusion:** SUVmax from ^{18}F-FDG PET images can be helpful in differentiating metastatic disease from second primary tumours in patients with synchronous pulmonary lesions. Further studies are warranted to confirm the consistency of these results.

Keywords: *SUVmax, Second primary tumour, Metastatic disease, Non-small cell Lung cancer.*

I. INTRODUCTION

Lung cancer is the leading cause of cancer-related mortality [5https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR1]. Although the incidence of lung cancer is decreasing [5https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR1], the number of patients presenting with a second primary cancer has dramatically increased in the last decadeshttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR2. A simultaneous second primary lung carcinoma occurs in 1-8% of lung cancer patients [6https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR4]. The occurrence of multiple primary cancers may be attributed to shared aetiological factors.

For non-small cell lung cancer patients ^{18}F-fluorodeoxyglucose positron emission tomography (FDG PET) is recommended according to the American College of Chest Physicians (ACCP) guidelines as standard work-up in potentially curable lung cancer based on conventional imaging. The rate of detection of unanticipated metastasis by FDG PET has been reported as 1-18% in patients with clinical stage I or II disease [7https://www.ncbi.nlm.nih.gov/pmc/articles/

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PMC2948164/ - CR9]. When an FDG PET scan is made for lung cancer staging, both metastases as well as synchronous primary tumours can be visualized. While multiple lung nodules of varying sizes are usually classified as metastases, it is a much greater challenge to distinguish a lung metastasis from a second primary lung carcinoma when only one additional pulmonary lesion is detected [4https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR10].

This retrospective study evaluated the potential of SUVmax measured with FDG PET to discriminate metastatic disease from second primary lung tumours in patients with non-small cell lung cancer.

II. MATERIALS AND METHODS

2.1. Patients

A total of 318 patients (220 men and 98 women) between November 2015 and October 2018 at Bach Mai hospital were retrospectively screened. First, patients were included in the 'second primary group' when they presented with two primary tumours, including any index tumour and a synchronous pulmonary tumour, defined as a tumour diagnosed within 6 months of diagnosis of the index tumour [1https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR8]. Second, patients with lung cancer metastasized to the same lobe (stage IIIB) or to different lobes or other organs (stage IV) were consecutively searched for and included to form the control group (or 'metastatic disease group'), until a similar sample size as of the second primary group was reached.

When FDG uptake is measured in small tumours, bias can be introduced by the partial volume effect resulting in underestimation of the tumour SUV. To prevent bias by partial volume effects, patients with a tumour smaller than 15 mm were excluded from analysis.

2.2. Research methods

- ***Study design:*** retrospective

- ***FGD-PET-CT imaging:***

All patients underwent diagnostic and/or staging FDG-PET-CT prior to biopsy or therapy. Patients were asked to fast at least 6 h before the FDG-PET-CT scan. All patients had a glucose level below 180 mg/dl and were injected intravenously with 0.15-0.20 mCi /kg (7-12mCi) FDG. At 45-60 min after the injection, data were acquired from the vertex to the upper thigh. Immediately after CT, a PET scan (PET/CT Biograph True Point - Siemens, Germany) was performed for about 25 min, with seven to eight bed positions and 3 min/position. PET images were reconstructed iteratively with CT data for attenuation correction, using an inline integrated Siemens Esoft Workstation system. Computerized tomography integrated positron emission tomography fusion images in transaxial, sagittal, and coronal planes were evaluated visually, and the SUVmax of lesions was obtained from transaxial images.

- Standardized uptake values

The maximum SUV [SUV_{max}, the activity from the maximum-valued pixel within the tumour volume of interest (VOI); hereafter referred to as SUV] normalized to injected activity and patient body weight was calculated at approximately 60 min after tracer injection for each primary lesion and the chosen metastatic lesion with use of the following equation: SUV = maximum activity concentration in the VOI [kBq/ml]/(injected dose [MBq/ml]/patient body weight [kg]). In patients with multiple metastatic lesions, the lesion with the largest

diameter was chosen to prevent partial volume effects.

- Area under the receiver-operating characteristic curve and cut-off value

After constructing a receiver-operating characteristic (ROC) curve of the SUVmax, the area under the curve (AUC) was assessed, and the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and odds ratio (OR) were determined for an optimal cut-off of the SUVmax.

- Statistical analyses

Since the SUVmax was normally distributed in both groups, an independent samples one-tailed ANOVA test was used to compare the mean SUVmax between the second primary tumour and metastatic disease group. Mean age were compared using a two-sided *t* test.

III. RESULTS

3.1. Patient characteristics

A total of 81 eligible patients with synchronous malignancies (44 metastatic disease and 37 second primary cancer, respectively) were included.

The mean age of the patients (57 men and 24 women) was 62.7 years (range: 26-87 years). Other patient characteristics are presented in Table 3.1. Patient age, sex were not significantly different between patients with metastatic disease and a second primary tumour ($p>0.05$). Adenocarcinomas were the most commonly diagnosed tumours in both groups.

Table 3.1. Patients with metastatic disease and a second primary tumour

Patient characteristics	Second primary group (n=37)	Metastatic disease group (n=44)	*p* value
Mean age (range)	62.5±10.7	62.8±8.9	>0.05
Sex (men/women)	26/11	35/9	>0.05
Histopathology			
ACC	32	41	
SCC	3	1	
LCC	2	2	

3.2. The SUVmax of metastatic disease and a second primary tumour

The SUVmax between lesions was significantly higher in patients with a second primary tumour (7.53±4.33) as compared to those with metastatic disease (4.35±2.58) ($p<0.001$). Figure 3.1 shows box and whisker plots of the SUVmax for both groups. Figure 3.2; 3.3 show a case of NSCLC with the primary tumor and figure 3.4 is the image of a case of lung metastase lesion.

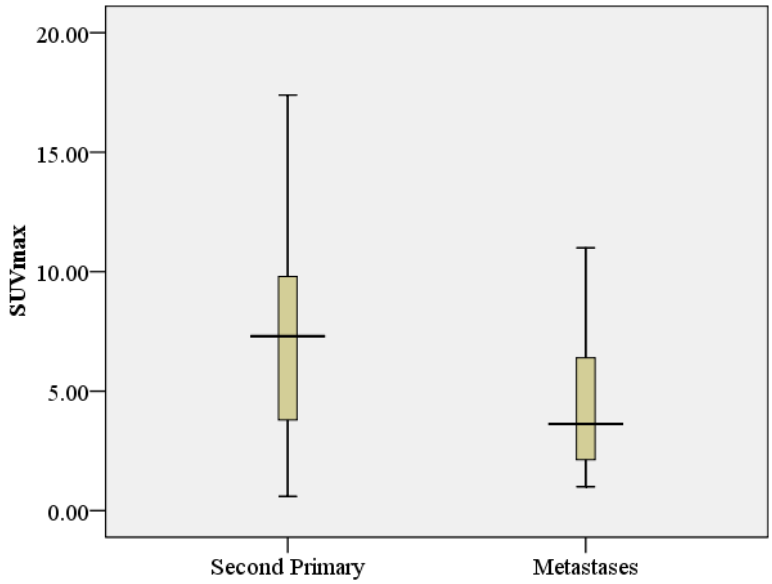

Figure 3.1. Box and whisker plots showing the distribution of the SUVmax for both groups.

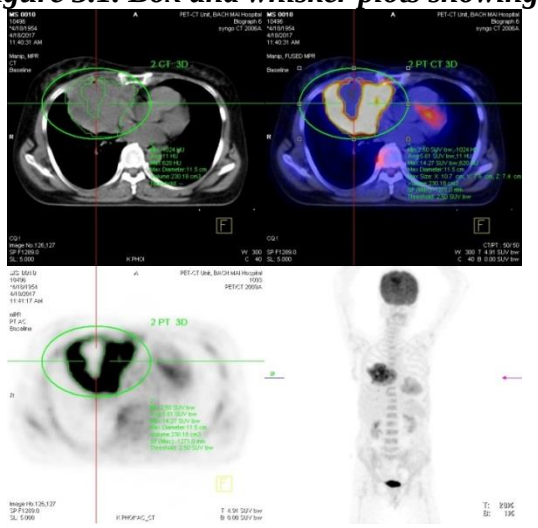

Figure 3.2. Primary tumor

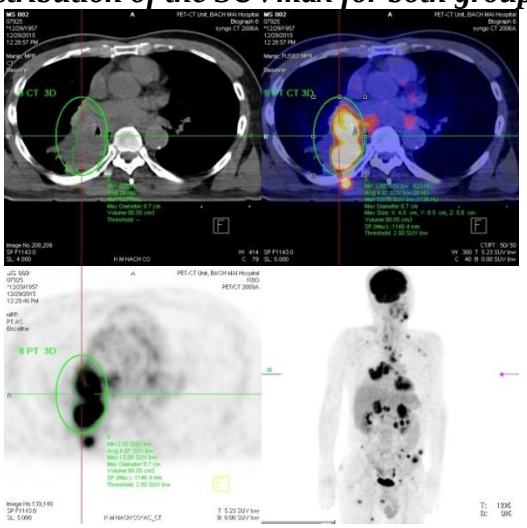

Figure 3.3. Primary tumor

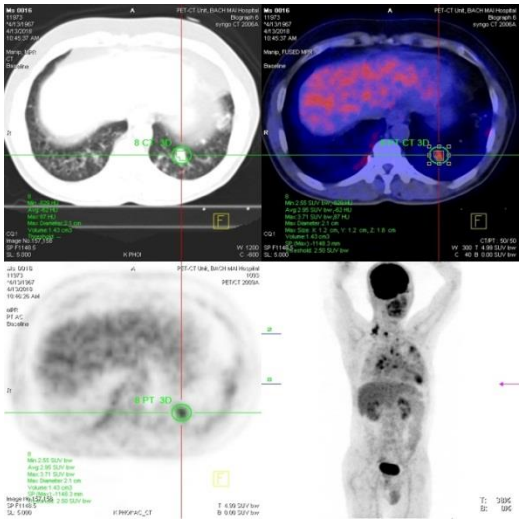

Figure 3.4. Lung metastase lesion

3.3. Area under the ROC and cut-off value

The AUC for SUVmax was 0.727 (95% CI: 0.67-0.86, *p*=0.001) to predict a second primary tumour (Fig. 3.2), which represents a moderately high discriminative ability of the SUVmax. The left upper corner of the ROC curve was chosen as the optimal cut-off, which corresponds with a ΔSUV of 7.52. This cut-off was associated with a sensitivity, specificity 70.3% (95%CI: 53.0 - 84.1); 93,2% (95%CI: 81.3 - 98.6), respectively.

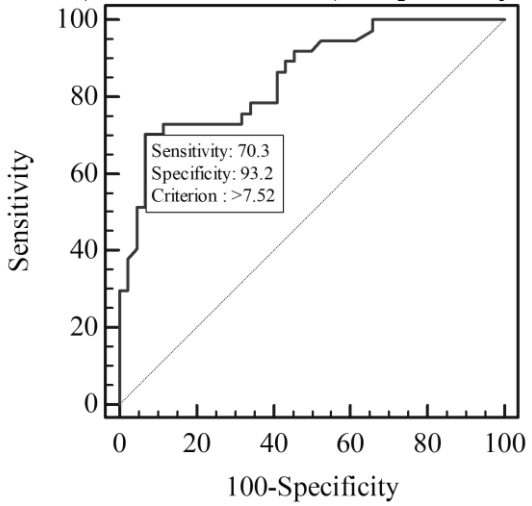

Figure 3.2 ROC curve and corresponding AUC statistics for the SUVmax.

IV. DISCUSSION

To our knowledge, this is the first study in Vietnam investigating the role of quantitative FDG PET in discriminating metastases from second primary tumours in cases of synchronously presenting lesions. A significantly larger SUVmax between two tumours was found in patients presenting with two primary tumours as compared to patients with metastatic disease involving the lungs. The moderately high accuracy, as measured with the AUC, as well as the good sensitivity and specificity of the SUVmax support the use of FDG PET as a modality for discriminating second primary lung tumours from metastases.

Previously, multiple case reports and studies have been published presenting cases of unexpected synchronous primary lung tumours detected by FDG PET [3https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR23]. On the contrary, only few reports exist in which FDG PET contributes in determining the clonal origin of synchronous tumours. The current available literature further supports our hypothesis that SUVs can differentiate tumours of common origin and with common biological behaviour (i.e. metastases) from those of separate clonal origin (i.e. multiple primary tumours). That is, FDG uptake has been reported to relate to several tumour characteristics, including histological subtype and tumour aggressiveness [2https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2948164/ - CR16].

FDG PET imaging is already extensively being used in patients with lung cancer for several purposes, including the diagnosis of recurrent disease, staging, prognostic stratification and radiotherapy planning. Also, it has been shown to be an accurate modality to differentiate benign from malignant solitary pulmonary lesions.

Furthermore, FDG PET can be used to monitor the response of non-small cell lung cancer to chemotherapy, radiotherapy and potentially to targeting of cell signalling pathways. The results presented implicate that the use of FDG PET might be expanded to the identification of early stage second primary tumours in patients with synchronous pulmonary lesions.

The population studied was carefully defined by stringent inclusion criteria. By including only those patients for whom sufficient data for a definite diagnosis of second primary cancer were available, the validity of this study was strengthened. Additionally, conditions between the patient groups studied were equalized as much as possible by choosing one reconstruction method for all PET images, since this is known to affect the SUV.

Several limitations to this study should be noted. First, this study has a small sample size. Because of the retrospective nature of the study. Second, diagnosis was made without histological confirmation in most cases of metastatic disease. In these patients, histopathology of the metastatic lesion was lacking, because the clinical presence of multiple lesions in a pattern typical for metastatic spread was considered sufficient for diagnosis of metastatic disease. If this study had been prospectively conducted, however, tissue for immunohistochemical and mutation analyses could have been sampled for all tumours, thereby assuring validity of diagnoses of both patient groups studied.

V. CONCLUSIONS

The results of this study suggest that measurement of the SUVmax using FDG PET images can be useful in differentiating metastatic disease from second primary cancer in patients presenting with synchronous pulmonary lesions.

This non-invasive technique, which is standardly available in pre-surgically staged lung cancer patients, may increase cost-effectiveness due to less cumbersome diagnostic procedures and more efficient identification of potentially curable second primary cancer patients.

However, larger and prospectively conducted studies are warranted to confirm the consistency of these results and to test the accuracy of the SUVmax at the cut-off value proposed in this study.

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RÉSUMÉ:

VALEUR DU SUVmax DANS LA DIFFÉRENTIATION DES MÉTASTASES ET DES CANCERS PULMONAIRES À CELLULES DE TAILLE NORMALE

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Objectif: Chez les patients avec cancer pulmonaire à cellules de taille normale ayant des lésions multiples, la différentiation avec les métastases a des implications therapeutiques et pronostiques importantes. Le but de cette étude rétrospective était de déceler des variations du potentiel de ^{18}F-FDG PET afin de distinguer métastases et tumeur pulmonaire primaire ou secondaire.

Méthodes: Chez 318 patients avec cancer pulmonaire à cellules de taille normale suivis de Novembre 2015 à Octobre 2018 à l'hopital Bach Mai, le groupe contrôle comporte des patients avec métastase pulmonaire. Les valeurs du SUVmax (Maximum standardized uptake values) mesurées avec le ^{18}F-FDG PET sur deux tumeurs pour chaque patient. Le SUVmax étant determiné et comparé entre le groupe non métastasé et le groupe métastasé. L'analyse de la courbe ROC (receiver-operating characteristic) permattait de déterminer la sensivité et la spécificité du SUVmax pour toute valeur optimale du cut off (valeur servant de repère).

Résultats: 81 patients (44 cas avec métastases, 37 cas avec cancer du poumon primitif ou secondaire) ont été inclus dans l'analyse. Le SUVmax était plus élevé de facon significative chez les patients avec cancer primitif ou secondaire du poumon que chez les métastases (7.53±4.33 vs 4.35±2.58, respectivement, p<0.001). L'espace sous la courbe ROC était 0.81 et le odds ratio pour le cut off optimal était 7.52.

Conclusion: Le SUVmax du ^{18}F-FDG PET pourraient aider à différencier métastase et non métastase. D'autre études pourront aider à consolider le résultat.

Mots clés: *SUVmax, second primary tumour, Metastastic disease, Non-small Lung cancer.*

A MALIGNANT TUMOR: RHABDOMYOSARCOMA OF A LITTLE GIRL WELL TREATED

Tran Van Truong*

ABSTRACT

Embryonal rhabdomyosarcoma is malignant, and rapidly proliferating neoplasm, spreading

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even into blood, and the prognosis is poor. It is different from rhabdomyoma. A benign striate muscular tumor, rather rarely found, and encountered in head and neck, facial and submandibular regions, it is also rarely seen in the myocardial region, often considered as hamartoma.

Most rhabdomyosarcomas are found in the head and neck, dental, alveolus areas, and are malignant, embryonal. This case report is a very difficult case that occurs in a one year old girl, in

a difficult surgical approach area : The pterygomaxillary area.

Early examination, precocious detection of tumor, combination of radical excision and chemotherapy, and longterm follow-up, allow good result, no recurrence after thirteen years of treatment.

Key words : *Embryonal Rhabdomyosarcoma, Little girl, Pterygoidian space, Surgery and chemotherapy, thirteen years no recurrence.*

Malignant tumour of maxillofacial regions take up about 9% of all kinds of cancers, in which rhabdomyosarcomas (striate muscle sarcoma) occurs commonly in children, in soft tissue such as cheek [3], tongue, palate [6], parotidian, temporal region [8]. Rhabdomyosarcomas accur primarily in children, but also in teenagers and adults [5]. The treatment is very difficult, especially to treat radically.

The special case presented in this report is Rhabdomyosarcoma in pterygomaxillary space of a more than one year old little girl (DOB: 9/1999). She was operated by Prof Tran Van Truong since November, 2000 and continued to be followed up and treated during more than thirteen years. At present, August 2013 the tumor has disappeared, no sign of recurrence in clinical and other examinations. The patient grows normally, in good health and intelligent.

Case report: Patient L.M, Fem, DOB: 9/1999. In 2000, January m four months after birth, her left cheek appeared a tumor growing up gradually (Fig 1).

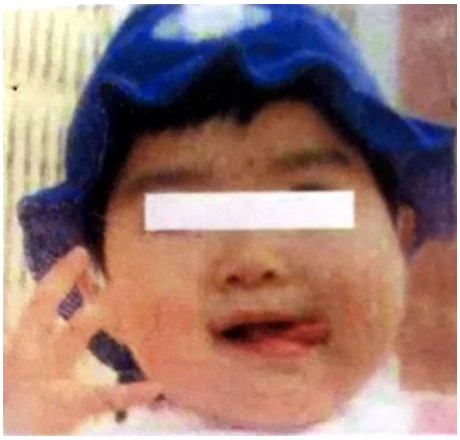

Fig 1. L.M. DOB: 9/1999

She was consulted by Professors of Odonto - Stomatology, Pediatries, Surgery, Radiology, Histopathology, all confirmed a tumor 3x2 cm dimensions in the left pterygomaxillary region, rapidly growing with erosion of bone (Fig 2, 3).

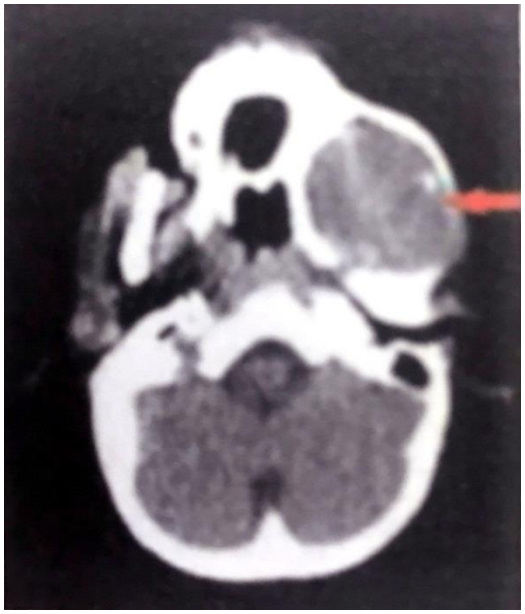

Fig 2. Tumor 3x2cm (CT)

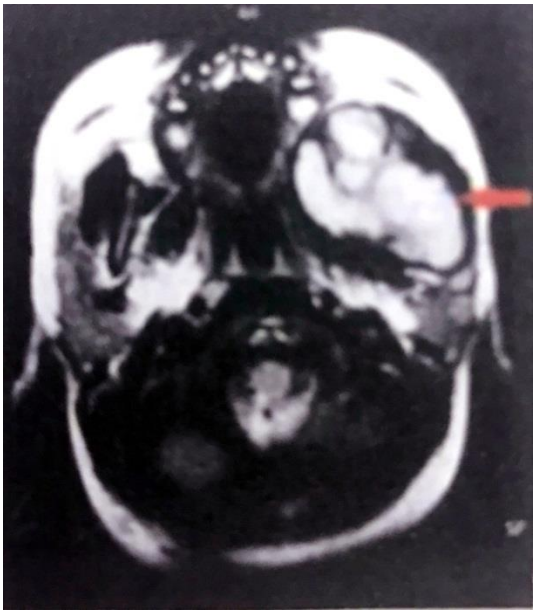

Fig 3. Tumor 3x2cm (RMI)

The patient was operated the first time in Nov 15, 2000 by Prof. Tran Van Truong for biopsic diagnosis and also for treatment. Histopathogical diagnosis confirmed: Embryonal Rhabdomyosarcoma, classification: T2NoMo stade 2 (Fig 4).

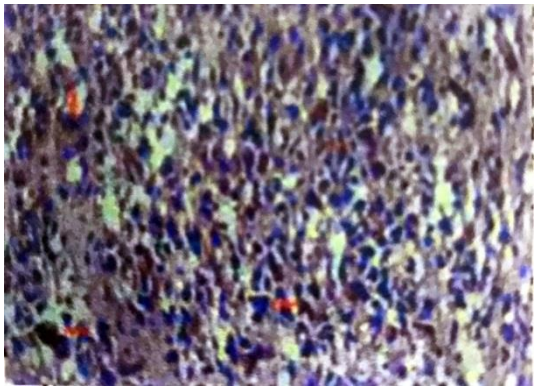

Fig 4. Hex100: Anaplastic pleomorphic condensation of strap, fusiform cell, monstrous nucleus with hyperchromatic nucleus in form of block or trapm in hyperplastic fibrous tissue

Microscopic manifestations: tumor consists of anaplastic condensation of strap and fusiform cells with pleomorphic and hyperchromatic nucleus link together in form of block or strap with monstrous and mitotic nucleoic. Cytplasm of cell is large, anaplastic cells of tumor distributed in hyperplastic strands of fibrous tissue [5].

Patient was treated with chemotherapy after surgery: Dactinomycin, Vincristin, Methotrexate,... in serveral months following chemotherapy.

Clinical and radiogical consultation in the left Pterygomaxillary space. (CT, RMI) showed: Tumor almost disappeared, there remained some suspect radiopaque spots (Fig 5, 6)

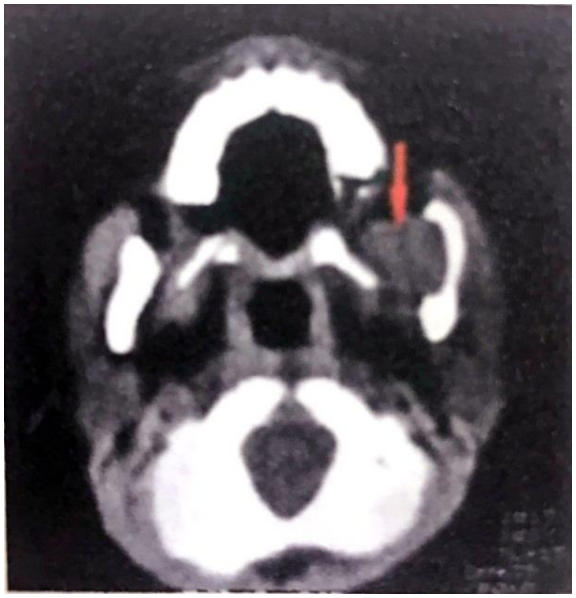

Fig 5. CT: Postop 1 year

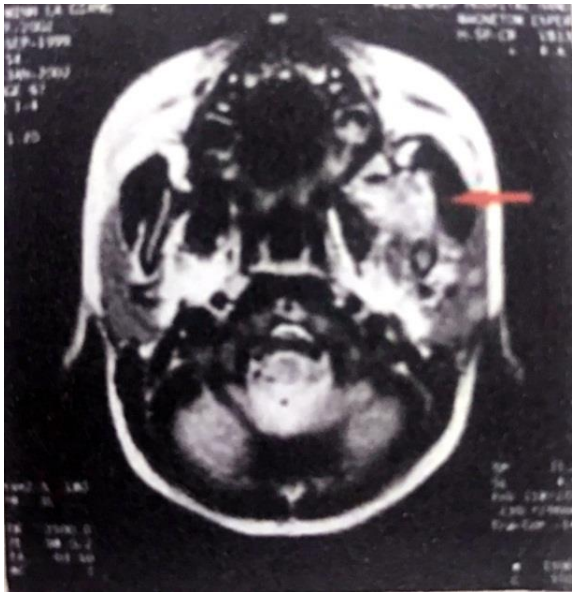

Fig 6. RMI: Postop 1 year

The patient was operated the 2nd time on 30/1/2002 to remove radically suspect tissue, and continued to be treated with chemotherapy for several months.

Results: At present Aug 2013, after 13 years of surgery and treatment, the patient is in good health (Fig 7), normally growing, intelligent, her face is symetric, no sign of recurrence.

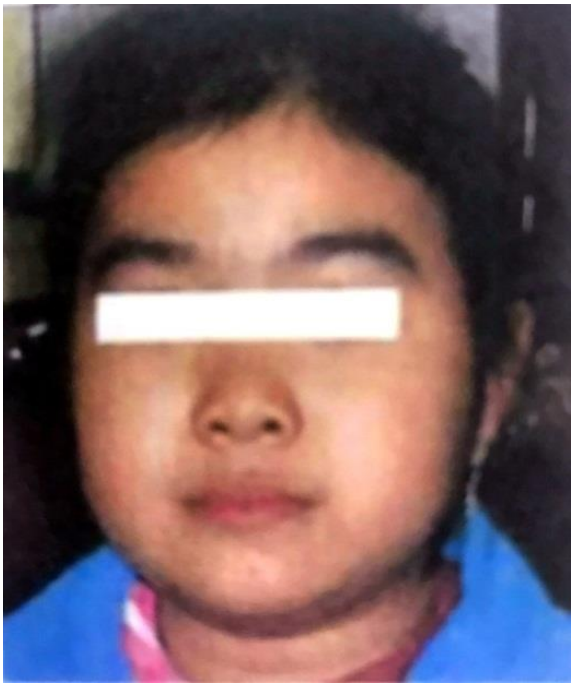

Fig 7. After 13 years (evolution normal)

Radiographic control: Panorex, CT no sign of recurrence in pterygomaxillary area and mandibular, maxillary regions (Fig 8, 9, 10, 11).

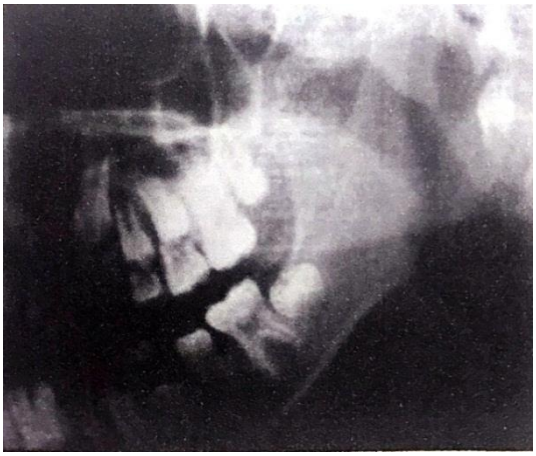

Fig 8. Left mandibular bone structure normal

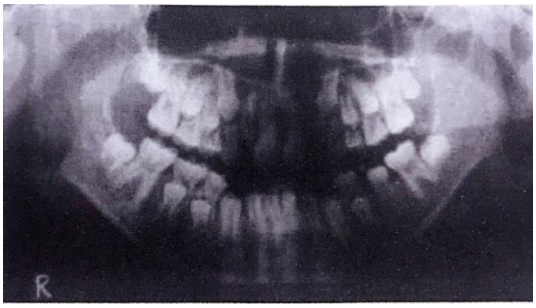

Fig 9. Panorex film: Pterygoidian space normal

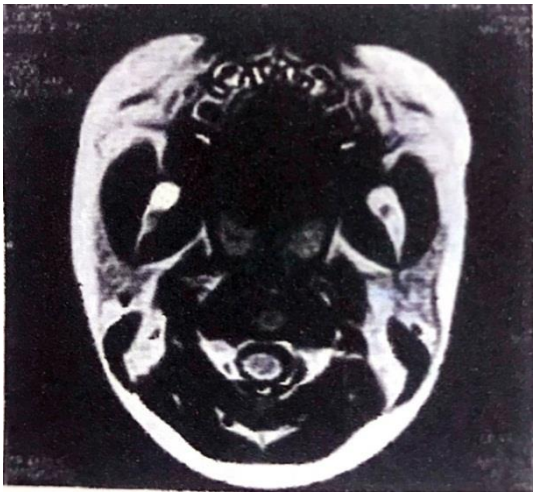

Fig 10. RMI: Left pterygoidian space bone structure normal

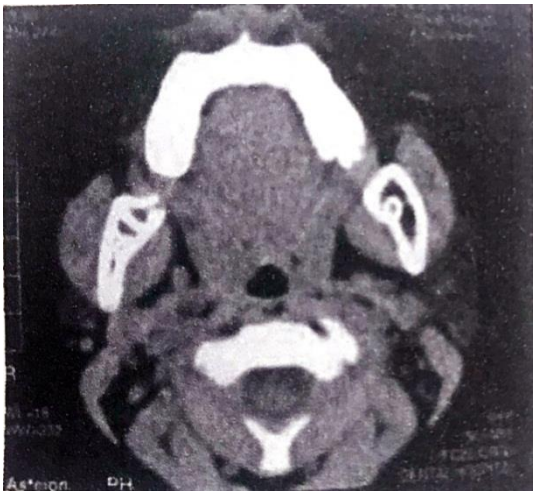

Fig 11. CT: Form and structure of left pterygoidian space normal

DISSCUSSION

Rhabdomyosarcoma is a malignant neoplasm, occurs most commonly in soft tissue of the head and neck region of teenagers and young adult [5], [6].

Embryonal rhabdomyosarcoma is malignant and rapidly proliferating neoplasm even spreading into blood, prognosis is poor. It is different from rhabdomyoma, benign striate muscular tumor, rare, encountered in head and neck, oral facial and submandibular regions. Rhabdomyoma is also rarely seen in myocardial region, often considered as hamartoma [7].

Most head and neck, dental, alveolus are malignant, embryonal lesions, pleomorphic rhabdomyosarcoma. This case report is a very difficult case occurring on a one year old small girl, in difficult anatomic region, pterygomaxillary area [8], [9]. Thanks to early examination and precocious detection of tumor and combination of radical excision of tumor in combination with chemotherapy and longterm follow up, the patient is well

treated, no recurrence after thirteen years of treatment (Fig 12a, b).

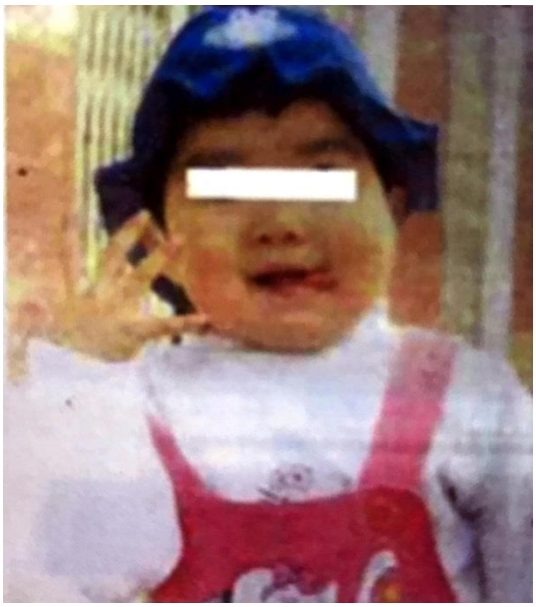

Fig 12a. Preop (11/2000)

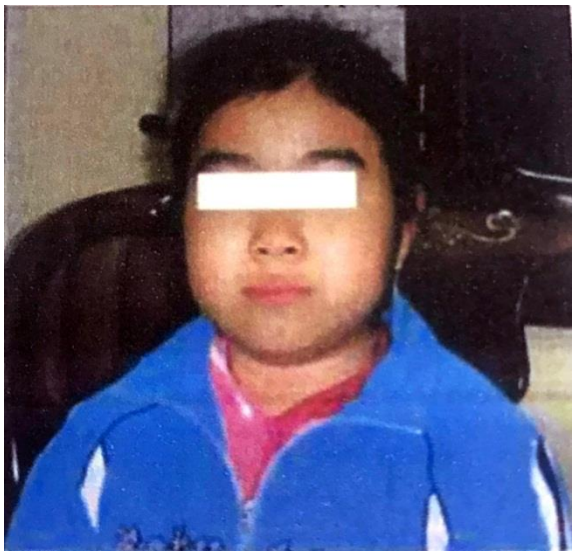

Fig 12b. Postop and Treatment (8/2013)

It is a remarkable success of science and technique of the Dentistry and maxillofacial surgery of Vietnam, the cooperation between different specialalities: histopathology, imaging diagnosis, chemotherapy... on the treatment of malignant rhabdomyosarcoma in small children.

Key words: *Embryonal Rhabdomyosarcoma, little girl, pterygoidian space, surgery and chemo - therapy, thirteen years no recurrence.*

RÉSUMÉ:

UNE TUMEUR MALIGNE : RHABDOMYOSARCOME BIEN TRAITÉ CHEZ UNE PETITE FILLE D'UN AN

Tran van Truong*

***Ancien Président de l'Association d'Odonto-Stomatologie du Vietnam*

Le rhabdomyosarcome est un néoplasme de prolifération rapide, même dans le système hématopoiétique, et son prognostic est toujours mauvais. Il est différent du rhabdomyome, une tumeur bénigne du muscle strié, de trouvaille plutôt rare, se retrouvant à la tête, au cou, aux régions faciale, et submandibulaire, parfois, rarement à la région myocardique, souvent appelé hamartome.

Le rhabdomyosarcome se retrouve à la tête, au cou, aux régions alveolaires, et sont malins, d'origine embryonnaire. Ce rapport est un cas d'abord chirurgical difficile : La région ptérygomaxillaire, chez une petite fille d'un an.

L'examen précoce, la détection rapide de la tumeur, son excision radicale, la chimiothérapie, et la surveillance à long terme, ont permis un bon résultat, pas de rechute après treize années de traitement.

STUDY ON SUVmax OF PRIMARY TUMOR AND METASTASE IN PATIENTS WITH NON-SMALL CELL LUNG CANCER

Huynh Quang Huy*

ABSTRACT

Background: Non-small cell lung cancer (NSCLC) accounts for approximately 80% of new diagnoses of pulmonary carcinoma. This study investigated the correlation between 18 F-fluorodeoxyglucose uptake in computerized tomography integrated positron emission tomography and tumor size, lymph node metastasis, and distant metastasis in patients with NSCLC. **Methods:** The records of 318 NSCLC patients (220 male, 98 female; mean age 60.94 years) were evaluated retrospectively.

Results: 278 cases were adenocarcinomas; 28 squamous cell carcinomas; and 12 large cell carcinoma. When the cases were categorized according to tumor size (group 1, ≤ 3 cm; group 2, > 3 and ≤5 cm; group 3, > 5 cm), the maximum standardized uptake value (SUVmax) was significantly lower in groups 1 and 2 compared with group 3 (p<0,001 for each). Considering all cases, tumor SUVmax was not correlated with age, gender or histopathological type. Lymph node metastases were seen in 250 cases: 80.2% of these were adenocarcinomas, 71.4% squamous cell carcinomas, and 58.3% large cell carcinomas. Neither lymph node involvement nor distant metastases were correlated with tumor SUVmax, although lymph node size was positively correlated with lymph node SUVmax (r=0.758; p<0.001). **Conclusions:** SUVmax was significantly associated with tumor size, but not with distant metastases or lymph node involvement. Therefore, SUVmax on positron emission tomography is not predictive of the presence of metastases.

Keywords: *Non-small cell lung cancer, Positron emission tomography, Standardized uptake value*

I. BACKGROUND

Pulmonary carcinoma is the most commonly diagnosed cancer worldwide (1.61 million cases, 12.7% of total carcinomas) and is the most common cause of cancer death (1.38 million deaths, 18.2% of total cancer deaths)https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B1. Non-small cell lung cancer (NSCLC) accounts for approximately 80% of new pulmonary carcinoma diagnoses and includes the histological subtypes adenocarcinoma, squamous cell carcinoma, large cell undifferentiated carcinoma, and mixed histologies [11https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B2].

Recently, the uptake of 18 F-fluorodeoxyglucose (FDG) as determined by computerized tomography integrated positron emission tomography (PET-CT) has become a widely used non-invasive diagnostic test. Fluorodeoxyglucose PET-CT measures the standardized uptake value (SUV) of a pulmonary mass, which quantifies the glucose avidity of the tumor. Fluorodeoxyglucose PET-CT has been shown to be useful for evaluating an indeterminate pulmonary nodule, staging lymph nodes, and evaluating

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local nodal and distant metastases. Fluorodeoxyglucose uptake correlates with the proliferative activity of tumor and is an independent prognostic factor in patients with lung cancer [3https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B3].

The objective of the present study is to assess whether the maximum SUV (SUVmax) in PET-CT correlates with tumor size, lymph node metastasis, distant metastasis, and tumor histopathological type in patients with NSCLC.

II. PATIENTS AND METHOD

2.1. Study population

The records of 318 patients newly diagnosed with NSCLC between November 2015 and October 2018 were evaluated retrospectively. The subjects were examined by Fluorodeoxyglucose PET-CT and histological diagnosis of masses. A total of 220 males and 98 females were included in the study, with a mean age 60.9±9.1 years (range 28-88 years). Pathologically, there were 278 adenocarcinomas (ACC), 28 squamous cell carcinomas (SCC), and 12 large cell carcinomas (LCC).

2.2. Method

- ***Study design:*** retrospective

- ***FGD-PET-CT imaging:***

All patients underwent diagnostic and/or staging FDG-PET-CT prior to biopsy or therapy. Patients were asked to fast at least 6 h before the FDG-PET-CT scan. All patients had a glucose level below 180 mg/dl and were injected intravenously with 0.15-0.20 mCi /kg (7-12mCi) FDG. At 45-60 min after the injection, data were acquired from the vertex to the upper thigh. Immediately after CT, a PET scan (PET/CT Biograph True Point - Siemens, Germany) was performed for about 25 min, with seven to eight bed positions and 3 min/position. PET images were reconstructed iteratively with CT data for attenuation correction, using an inline integrated Siemens Esoft Workstation system. Computerized tomography integrated positron emission tomography fusion images in transaxial, sagittal, and coronal planes were evaluated visually, and the SUVmax of lesions was obtained from transaxial images.

- ***Statistical evaluation***

Statistical analysis was performed using SPSS software (version 12.0). Values were expressed as means±standard deviation. Statistical significance was assessed at the $p < 0.05$ level. One-way analysis of variance was performed to compare SUVmax among the histological types. Spearman's correlations were computed between tumor SUVmax and tumor diameter, mediastinal lymph node diameter, and lymph node SUVmax. Independent samples *t*-test was used to determine the significance of the difference in tumor SUVmax according to the presence of lymph node or distant metastases.

III. RESULTS

The characteristics and SUVmax of the 318 NSCLC cases are summarized in Table 1. A significant relationship was found between tumor SUVmax and tumor size ($r=0.541$; $p<0.001$). When the cases were divided into three groups based on tumor size (group 1, ≤ 3 cm; group 2, >3 cm and≤5 cm; and group 3, >5 cm), tumor SUVmax was

differ significantly between groups 1, 2 and 3 (p<0,001). Considering all cases, tumor SUVmax was not significantly correlated with age, gender or histological type (adenocarcinoma, squamous cell carcinoma, and large cell carcinomas).

Table 3.1. Characteristics and SUVmax of the NSCLC cases

		n (%)	SUV (mean ± SD)
Sex			
	Male	220 (69.2)	11.36 ± 5.83
	Female	98 (30.8%)	10.02 ± 4.25
Histology			
	Adenocarcinoma	278 (87.4%)	10.75 ± 5.30
	Squamous cell carcinoma	28 (8.8%)	12.367 ± 6.81
	Large cell carcinomas	12 (3.8%)	12.17 ± 4.22
Tumor size			
	≤ 3 cm	88 (22.7%)	7.31 ± 2.97
	> 3≤5 cm	114 (35.8%)	10.62 ± 4.19
	> 5 cm	116 (36.5%)	14.03 ± 6.11
Lymph node metastases			
	N0	68 (21.4%)	9.81 ± 5.72
	N1	18 (5.7%)	9.04 ± 3.98
	N2	130 (40.9%)	11.48 ± 5.34
	N3	102 (32.1%)	11.36 ± 5.42
Distant metastasis			
	M0	144 (45.3%)	10.83 ± 5.15
	M1	28 (8.8%)	11.53 ± 6.22
	M2	61 (19.2%)	10.83 ± 6.05
	M3	85 (26.7%)	11.04 ± 5.20

Among the 318 cases, lymph node metastases were seen in 250 cases (78.6%). Lymph node metastases were present in 80.2% (223/278) of adenocarcinomas, 71.4% (20/28) of squamous cell carcinomas, and 58.3% (7/12) of large cell carcinomas. When cases were divided into 4 groups according to lymph node involvement, there was no difference in tumor SUVmax between the groups. However, lymph node size was positively correlated with lymph node SUVmax (r = 0.758, p<0.001). Tumor SUVmax did not differ significantly according to the presence of distant metastases.

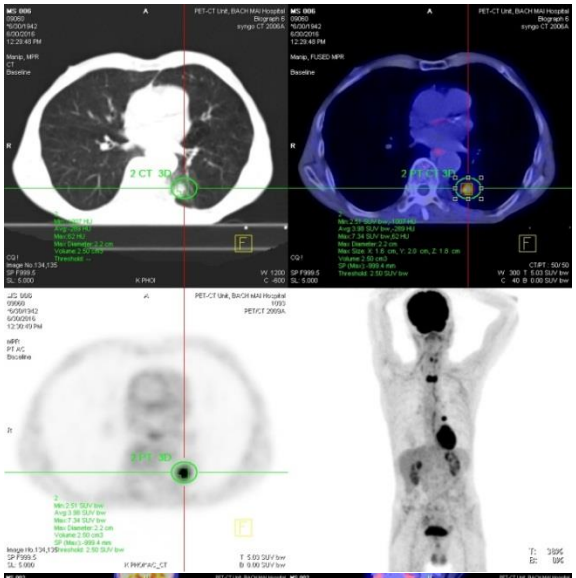

Figure 3.1. Patient with primary tumor

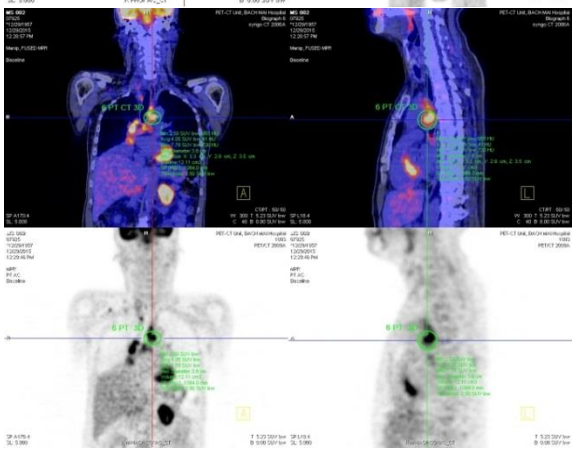

Figure 3.2. Mediastinal metastase

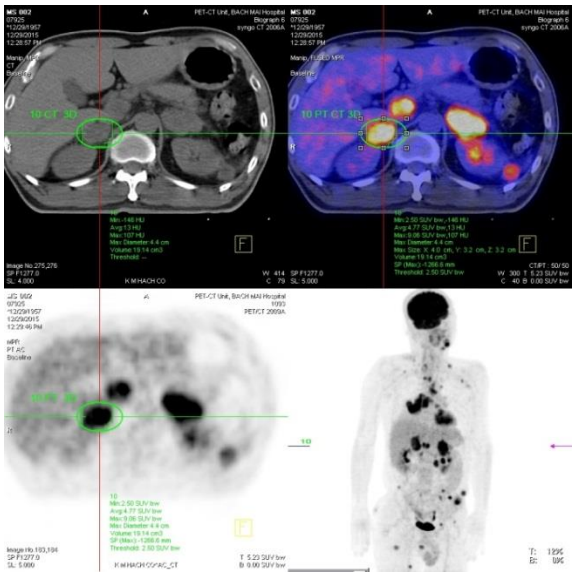

Figure 3.3. Adrenal gland metastase

IV. DISCUSSION

Although CT or magnetic resonance imaging provides precise anatomical and morphological information, the role of FDG-PET-CT has increased for diagnosis and staging of lung cancerhttps://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B7. Recently, FDG uptake has been reported to be a prognostic factor in patients with lung cancer [4https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B4]. Patz et al. [9https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B8] demonstrated that patients with positive FDG-PET-CT results in treated lung cancer had a significantly worse prognosis than patients with negative results. Therefore, we examined whether SUVmax correlates with tumor size, lymph node and distant metastases in patients with NSCLC. Tumor size, but not lymph node or distant metastases, was related to the tumor SUVmax. Doom et al. [5https://www.ncbi.nlm.nih.gov/pmc/articles/

PMC3816207/ - B9] also reported a strong significant association between tumor size and SUVmax in patients with NSCLC. Another study in patients with stage I NSCLC showed a significant association between the primary tumor, SUVmax and tumor size, with tumors≤3 cm having a significantly lower SUV than tumors>3 cm [10https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B10].

Aquino et al. [1https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B13] reported a significant difference in FDG uptake between the well-differentiated adenocarcinoma subtype bronchioloalveolar carcinoma (BAC) and non-BAC adenocarcinomas, including well-differentiated non-BAC tumors. Adenocarcinomas with mixed features that included BAC had a peak SUV (1.5±0.2) lower than that of all other non-BAC adenocarcinomas (SUV, 3 ± 1.5), which included one poor tumor, three moderate tumors, and one well-differentiated tumor [1https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B13]. Vesselle et al. [11https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B2] showed that the uptake by large cell carcinomas was greater than that by adenocarcinomas and was not significantly different from uptake by squamous cell carcinomas. However, we observed no difference in SUVmax among histological types. Our data were in concordance with previous studies that documented lower uptake by adenocarcinomas compared with squamous cell carcinomasand lower uptake by BAC adenocarcinomas compared with non-BAC adenocarcinomas.

Fluorodeoxyglucose-PET-CT is already an indispensable modality for evaluating lymph node and distant metastases. Many reports have suggested that FDG-PET-CT is superior to CT in the accuracy of N-staging for lung cancer. Therefore, FDG-PET-CT is now regarded as the most accurate imaging modality for N-staging of lung cancer. However, a significant number of false-negative and false-positive findings of lung cancer, including N-staging, on FDG-PET-CT have been reported. Nambu et al. [8https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B32] demonstrated that the likelihood of lymph node metastasis increased with an increase in SUVmax of the primary tumor; for primary lung cancer with a SUVmax greater than 12, the probability of lymph node metastasis was high, reaching 70%, irrespective of the degree of FDG accumulation in the lymph node stations. They concluded that this finding would allow a more sensitive prediction of the presence of lymph node metastases, including the microscopic ones that cannot be detected by direct evaluation of lymph node stations. Consistent with these results, Higashi et al. [6https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B33] documented in a multicenter study that the incidence of lymphatic vessel invasion and lymph node metastasis in NSCLC were associated with 18 F-FDG uptake, concluding that 18 F-FDG uptake by a primary tumor is a strong predictor of lymphatic vessel invasion and lymph node metastasis. In the present study, although tumor SUVmax was higher in patients with lymph node metastasis than in those without, the difference did not reach statistical significance. We also observed that

the frequency of lymph node metastasis was higher in adenocarcinomas (80.2%) than in squamous cell carcinomas (71.4%), suggesting that pathological subtype may be a significant factor associated with lymph node metastasis. In contrast, a previous study showed no difference in the frequency of lymph node metastasis between the two pathological subtypes.

Based on univariate analysis, Jeong et al. [7https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B14] concluded that metastasis detected by PET imaging, which can affect staging by aiding in the discovery of metastasis to contralateral lymph nodes or distant organs, was an insignificant factor, and that metastatic findings on PET had weak discriminative power. According to Cerfolio et al. [2https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B16], FDG-PET-CT does not replace the need for tissue biopsies for staging N1 or N2 lymph nodes, or metastatic lesions, as false positives and false negatives were observed in all stations in their study. However, FDG-PET-CT resulted in better patient selection before pulmonary resection. FDG-PET can also help in targeting areas for biopsy and identifying unsuspected N2 and M1 disease [3https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3816207/ - B3]. In the present study, tumor SUVmax was not significantly correlated with distant metastases. This may be attributable to the finding of increased 18 F-FDG uptake by subclinical inflammatory lesions as well as by malignant tumors.

V. CONCLUSIONS

SUVmax was associated with tumor size, but not with distant metastases or lymph node involvement. Thus, SUVmax determined by FDG-PET-CT is not predictive of the presence of metastases. Moreover, SUVmax was not related to histological tumor. Larger prospective and randomized analyses may potentially reveal more significant relationships.

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RÉSUMÉ:

ETUDE SUR LE SUVmax DE LA TUMEUR PRIMITIVE ET DE LA MÉTASTASE CHEZ LES PATIENTS AVEC CANCER À CELLULE DE TAILLE NORMALE

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*****Université Pham Ngoc Thach*

Position du problème: Le cancer du poumon à cellule de taille normale (NSCLC) occupent environ 80% de nouveaux cas de carcinome du poumon. Cette étude recherche la corrélation entre la prise du 18F-Fluorodeoxyglucose dans la tomographie à émission du positron intégré, et le calibre de la tumeur, la métastase des ganglions lymphatiques et les métastases distantes chez les patients avec NSCLC.

Méthodes: Les données chez 318 cas avec NSCLC (220 hommes, 98 femmes, âge moyen 60.94 années) ont été étudiées rétrospectivement.

Résultats: Il y a 278 cas d'adénocarcinomes, 28 carcinomes à cellules squameuses, et 12 carcinomes a grandes cellules. Quand les cas pathologiques sont classés suivant le calibre de la tumeur, (groupe 1, ≤ 3cm, groupe 2, > 3cm et ≤ 5cm, groupe 3 ≥ 5cm) le SUVmax était significativement moins élevé chez le groupe 1 et 2, comparé au groupe 3 ($p < 0.001$ pour chaque groupe). Considérant tous ces cas, le SUVmax de la tumeur ne correspondait ni avec l'âge, le sexe, ou le type histopathologique. Les métastases aux ganglions lymphatiques se retrouvaient dans 250 cas: 80.2% étant des adénocarcinomes, 71.4% des carcinomes aux cellules squameuses, et 58.3% des carcinomes aux grandes cellules. Pas un seul ganglion ou une métastase distante ne correspondait au SUVmax de la tumeur, bien que le calibre du ganglion corresponde positivement avec le SUVmax de la tumeur ($r = 0.758$; $p < 0.001$).

Conclusion: Le SUVmax était significativement associé au calibre de la tumeur, mais pas avec les métastases distantes ou l'implication des ganglions lymphatiques. Par conséquent, le SUVmax ou la tomographie a l'émission de positron n'est pas prédictive de la présence de métastases.

Mots clés: *Non-small cell lung cancer, Positron emission tomography, Standardized uptake volume.*

COMPARE THE WOUND HEALING CAPABILITY OF *PIPER BETLE* L. EXTRACTS COMBINING BONE MARROW MONONUCLEAR CELLS VERSUS ADIPOSE-DERIVED MONONUCLEAR CELLS

Nguyen Ngoc Hieu*,**, Ngo Nhat Hoang*,
Le Hoang Duy Minh*, Che Thi Cam Ha*

ABSTRACT

Stem cells own renewable and differentiation into other cells to repair the wounded organs in the body. Stem cells can be isolated from various parts of the body with different potentials. However, there is little research comparing the effects of stem cells types on the tissue repair process. In addition, *Piper betle* L. is known as a traditional valuable medicine to cure the open wounds through antibacterial, anti-inflammatory capabilities and stimulating fibroblast proliferation. Thus, this research figures out the effects of mononuclear cells from bone marrow and from adipose tissue as well as the combination of these cell types with the *Piper betle* L. extraction in order to heal process through morphological and histological evaluation. **Method:** After ulcerating the mice, mononuclear cells were injected into the tail's vein. After 2 hours, we applied the 10% - *Piper betle* L. extraction and kept track of the mice for 13 days. **Results:** the wound healing capability of the mononuclear cells from adipose tissue was faster than that of from bone marrow. Also, the combined group of 10% - *Piper betle* L. extraction associated with the mononuclear cells from adipose and from bone marrow healed the wound completely after 8 days and 10 days respectively. Besides, both of the two aforementioned groups are faster than the control group.

Keyword: *Piper betle L., antimicrobial, wound healing, extraction, bone marrow mononuclear cells (BMNCs), adipose-derived mononuclear cells (ADMNCs)*

I. INTRODUCTION

Skin plays important roles in our lives in which it takes the responsibility of body protection to against the external effects [1]. When the skin is wounded, a range of complicated processes happens like immune cells are pulled towards the wounded area, new stromal tissues are produced by fibroblasts, epithelium layer is created horn cells, and finally, the blood vessels in the wound are re-distributed. Skin wound treatment is a complex multiple phase process and requires various factors such as growth elements, cytokine and chemokine as well as other functional cells [2], [3].

Stem cells, which acquire immunomodulation, renewal and differentiation characteristics, are considered as a new effective treatment. The recent finding shows a great potential of the mononuclear cells when it comes to regenerative medicine because of the capability of differentiating into a range of cells as well as the release of cytokine and growth elements in regenerating process [4].

Piper betle L. is a tropical vine in the Piperaceae group. It can be found in South

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and Southeast Asian countries. Its leaves are known as a precious medicine which is used to cure several diseases such as ulcer, joint pain, hemorrhoids, etc. More research shows that the elements of Piper betle's leaves are the capable resistance of nitrification, against oxygenation, venous thrombosis without weakening the hemostasis and cancer inhibition [5].

With this research, we provide new data about the mechanism and the speed of healing wound of the mononuclear cells derived from adipose or bone marrow associated with *Piper betle* L. extraction in order to find out an effective and safe treatment.

II. MATERIAL AND METHOD

Material

Male Swiss aged from 7 to 8 weeks, weight 33g ± 3g. Plant samples (*Piper betle* L.) collected from Nui Thanh District, Quang Nam Province, Vietnam were identified and classified by Hue University of Sciences.

Method

Dispense (Collect) the extraction from *Piper betle* L. leaves

Prepare 500g fresh P. betle leaves washed twice by distilled water. Comminute the leaves, then compost with ethanol 70% (ratio 1:10) in 5 hours, 50^0C for oil evaporating. Concentration by evaporation using rotary evaporator at 70^0C to 5% solvent left, keep the balm at 4ºC [6].

Test the anti-microbial potential

Anti-microbial assay was tested by Vander Bergher & Vlietlinck's method (1991) [7], [8]. The vaccine-auditing strains used include: Gram-negative Bacteria: *Escherichia coli* (ATCC25922), *Pseudomonas aeruginosa* (ATCC27853) and Gram-positive bacteria: *Enterococcus faecalis* (ATCC29212), *Staphylococcus aureus* (ATCC25923).

Isolation bone marrow mononuclear cells (BMNCs) and adipose-derived mononuclear cells (ADMNCs)

BMNC was obtained by using the method of Soleimani (2009) [9]. Bisect each hind limb by cutting through the knee joint. Remove the muscle and connective tissue from both the tibia and the femur by scraping the diaphysis of the bone clean then pulling the tissue toward the ends of the bone. After cleaning, store the bones in DMEM supplemented with 1 penicillin/streptomycin on ice. Cut the ends of the tibia and femur just below the end of the marrow cavity using a pair of sharp rongeur. Insert a needle attached to a 1 mL syringe containing complete media into the spongy bone exposed by removal of the growth plate. Flush the marrow plug out of the cut end of the bone with 1 mL of complete media and collect in a 10 mL tube on ice. Filter cell suspension using 100µm filter. Determine the yield and viability of cells by Trypan blue and counting on a hemocytometer. Centrifuge the cell suspension at 2500 rpm in 5 minutes at room temperature then remove the supernatant. Re-suspend the cell with PBS 1X to 7mL and lay on the Ficoll plaque 5mL to isolate mononuclear cells. Centrifuge at 1500 rpm in 20 minutes at room temperature. After centrifugation, collect the middle ring with mononuclear cells.

ADSC was obtained by using the modified method of Mohammadi-Sangcheshmeh A. (2013) [10]. Obtain 1g adipose tissues under the skin, put into the sterilized 15 mL Falcon tube, add 1mL DMEM/collagenase (mg/mL) and vortex. Incubate in 15 minutes at room temperature and put into the heat cabinet in 50 minutes at 37ºC, stir constantly in 10 minutes. Filter and

wash with 1mL PBS, then centrifuge the suspension at 2500 rpm in 5 minutes at 37°C. Remove the supernatant, add 1mL PBS, shake and centrifuge at 2500 rpm in 3 minutes at 37°C to collect the mononuclear cells.

Characterization of Mononuclear Cell

The BMNCs and ADMNCs were harvested and counted. Approximately 1×10^5 cells were washed and labeled with fluorescence-conjugated antibodies (CD34-PE, CD90-FITC, CD146-PC5) at room temperature for 30 min. Isotype control IgG was used to stain the cells as a control. After two washes (with PBS), the cells were analyzed by fluorescence-activated cell sorting (FACS).

Healing potential test with *Piper betle* L. extraction

Piper betler L. balm was diluted with distilled water to 10% concentration. Fifteen mice after skin excision were divided into 3 groups. Piper betle extraction with 10% concentration group; 10% Betadine (anti-bacteria) group and control group. Anoint the extraction after excision 2 hours and twice a day. Observe the wound morphology and histological.

Healing potential test with mononuclear cells

Fifteen mice after 7 mm skin excision using biopsy were randomly divided into 3 groups: NaCl administration group; 10^6 bone marrow mononuclear cells group administrated through tail vein and 10^6 adipose derived mononuclear cells group administrated through tail vein. Cell was suspend with NaCl 0.9% before injecting. Conduct the observation within 13 days.

Healing potential test combining the *Piper betle* L. extraction and mononuclear cells

Fifteen mice after excision were divided into 3 groups. Group 1: NaCl injected group. Group 2: 10^6 bone marrow mononuclear cells injected. Group 3: 10^6 adipose-derived mononuclear cells injected. Mice in group 2 and 3 were anointed with *Piper betle* L. extraction 10% concentration after excision 2 hours, twice a day. Observe the wound morphology within 13 days and evaluate the histological.

Histological staining

Tissue samples of each group were collected at the 13th day after treatment. Samples were fixed in formandehyde 10%, mold the paraffin blocks, cut and stained with Hematoxyline & Eosine. Observe the specimen by Olympus microscope (Japan).

Evaluate the hematological index, liver and kidney feature

After 13 treatment days**,** collect the mice heart blood to evaluate the hematological index (Red blood, white blood, platelet), live enzymes (AST - ALT), kidney feature (Creatinine - Urea). 2mL blood was added into 2 tubes, tested in Hematology Department and Biochemistry Department, Hue Central Hospital.

Statistical Analysis

Repeat all experiments three times. ANOVA statistical software was used for data analysis with significance level $P < 0.05$.

III. RESULTS

Anti-microbial potential of *Piper betle* L. extraction

The result showed that *Piper betle* L. extraction at original concentration could eliminate 4 types of experiment bacteria, which strongly affect 2 Gram (+) strains: *P. faecalis* and *S. Aureus*. Considering 2 bacteria strain causing skin diseases, Piper betle extraction acted more effectively on *E. coli* than *E. Faecalis*. At a dilution of 25%, Piper betle extraction showed the anti-bacteria potential to *S. Aureus* strain.

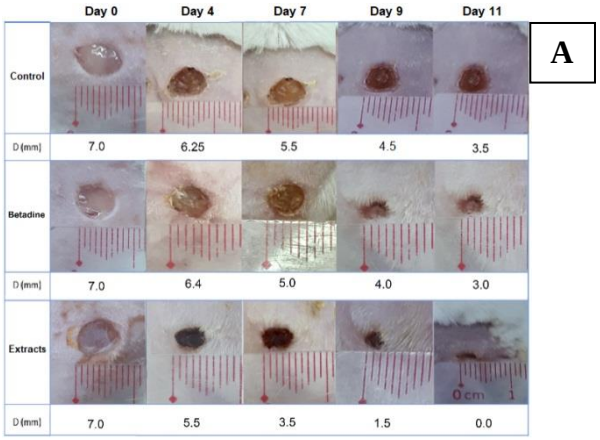
Table 1. Antibacterial activity of crude ethanol extract of Piper betle L. by agar well diffusion method

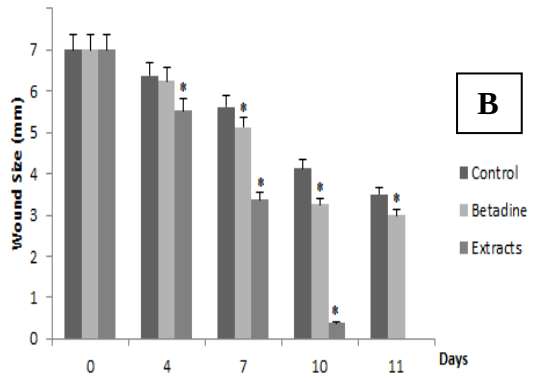
Concentration (%)	Anti-bacterial ring diameter Gram(-) (mm)		Anti-bacterial ring diameter Gram (+) (mm)	
	ATCC25922	ATCC27853	ATCC25923	ATCC29212
100	17,3 ± 0,4	15,0 ± 0,7	25,3 ± 0,9	5,2 ± 0,2
25	0	0	20,0 ± 0,7	0
6,25	0	0	0	0

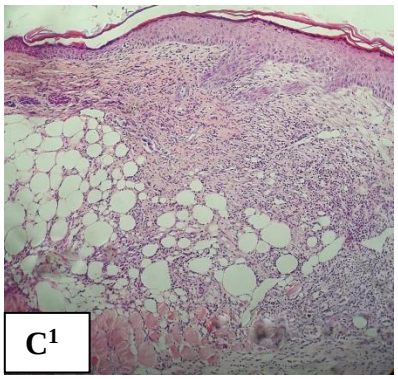
Several previous studies confirmed the anti-bacteria potential of Piper betle L. extraction. Study of Chakraborty D. et al. (2011) about anti-bacteria potential of *Piper betle* L. extraction showed that the extraction can strongly inhibit 4 strains: *Streptococcus pyogenes*, *S. aureus*, *Proteus vulgaris* and *E. coli* [11]. Another study of P. *Betle* extraction's anti-bacteria ability also reported that the extraction was an proliferation inhibitor of several strains: *E. coli*, *P. aeruginosa*, *S. aureus* (Chi et al, 2016; Chinh et al, 2009) [12], [13].

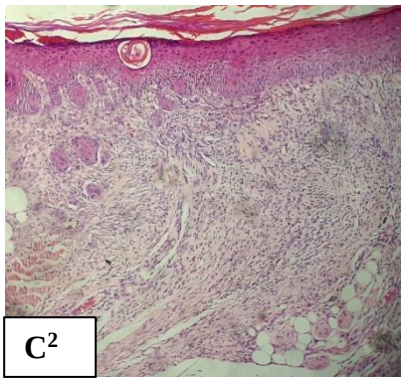
Effect of *Piper betle* L. extraction to wound healing process in mice

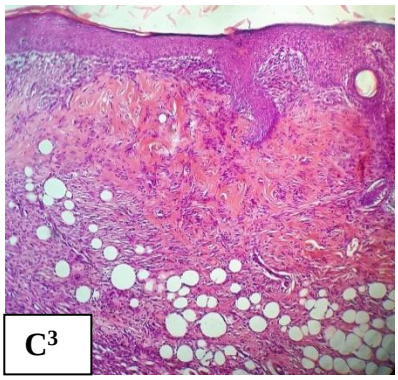
After excision, mice were divided in to 3 groups: Piper betle extraction at a dilution of 10% group (EX group); 10% Betadine (anti-bacteria) group and control group. Anoint the extraction after excision 2 hours and twice a day. Observe within 15 days. Wound morphology, healing time and histological result was collected and showed in Figure 1.











A. Wound morphology within 11 treatment days with Piper betle extraction**, B.** Average wound size in different groups on days of treatment, **C.** Histological structure of different groups after 11 days, **C^1:** Control group sample, **C^2:** Betadine group sample, **C^3:** *Piper betle* L.extraction group sample.

Control group and Betadine group showed the longer wound healing time than the EX group. There was a significant difference in wound size of EX group from the 4th day in comparison to other groups, while it was significantly different between Betadine group and control group from the 7th day. Wound was completely recovered at the 11th day in EX group. The Betadine group wound healed at the 15th day while the control group did not.

We evaluated the histological structure of each mice group by using Hematoxyline & Eosin (H&E) staining. In control group, the histological analysis showed the atrophic epidermis, edema stromal dermis, multiple inflammatory and congestive cells. In Betadine group, the result showed the atrophic epidermis, squamous cell proliferation in dermis, slightly swollen follicle tissue, infiltration of inflammatory cell, mild proliferation of blood vessels and fibroblast. In EX group, the result showed normal epidermis, regular infiltration of inflammatory cell, increasing blood vessels, fibroblast proliferation, numerous follicle.

Flow cytometry

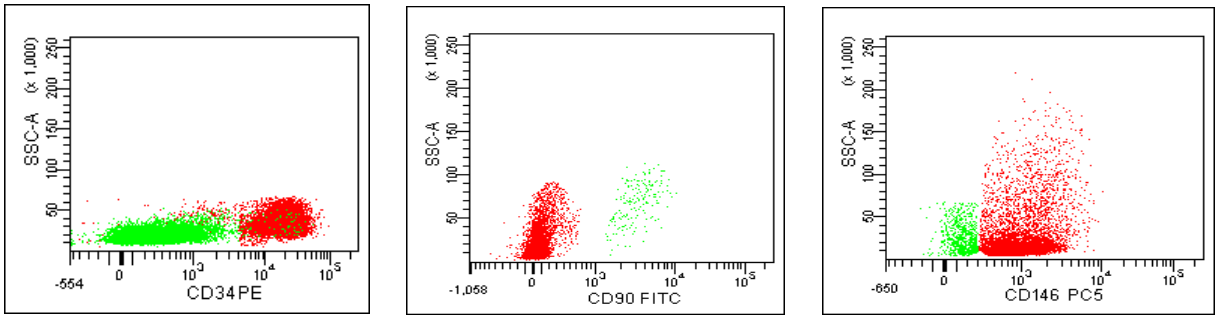


Figure 2. FACS of Bone Marrow Mononuclear Cells

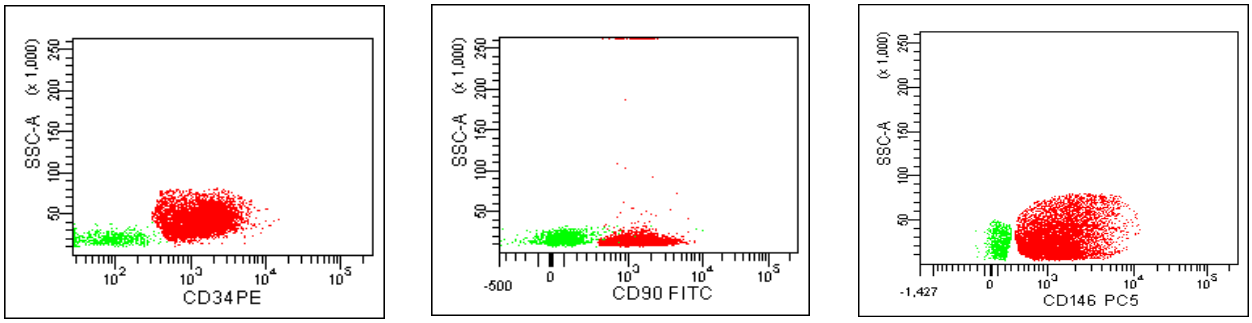


Figure 3. FACS of Adipose-Derived Mononuclear Cells

Table 2. List of antibodies used for flow cytometry validation

Cell	Antibody	Fluorophore	Negative	Positive
BMNCs	CD34	PE		+
	CD90	FITC	+	
	CD146	PC5		+
ADMNCs	CD34	PE		+
	CD90	FITC		+
	CD146	PC5		+

Effect of mononuclear cell to wound healing process

Mice after excision were injected BMNCs and ADMNCs through tail vein, then observed within 13 days. The results were introduced in Figure 4. At the second day, ADMNCs group wound was dry, initially close while BMNCs group wound was close at the 4th day. On the contrary, the control group wound was dry but there was no sign of closure.

At the 10th day, ADMNCs group wound was completely recovered. After 3 days, the wound of BMNCs group was fully healed while the control group was still in the regeneration phase.

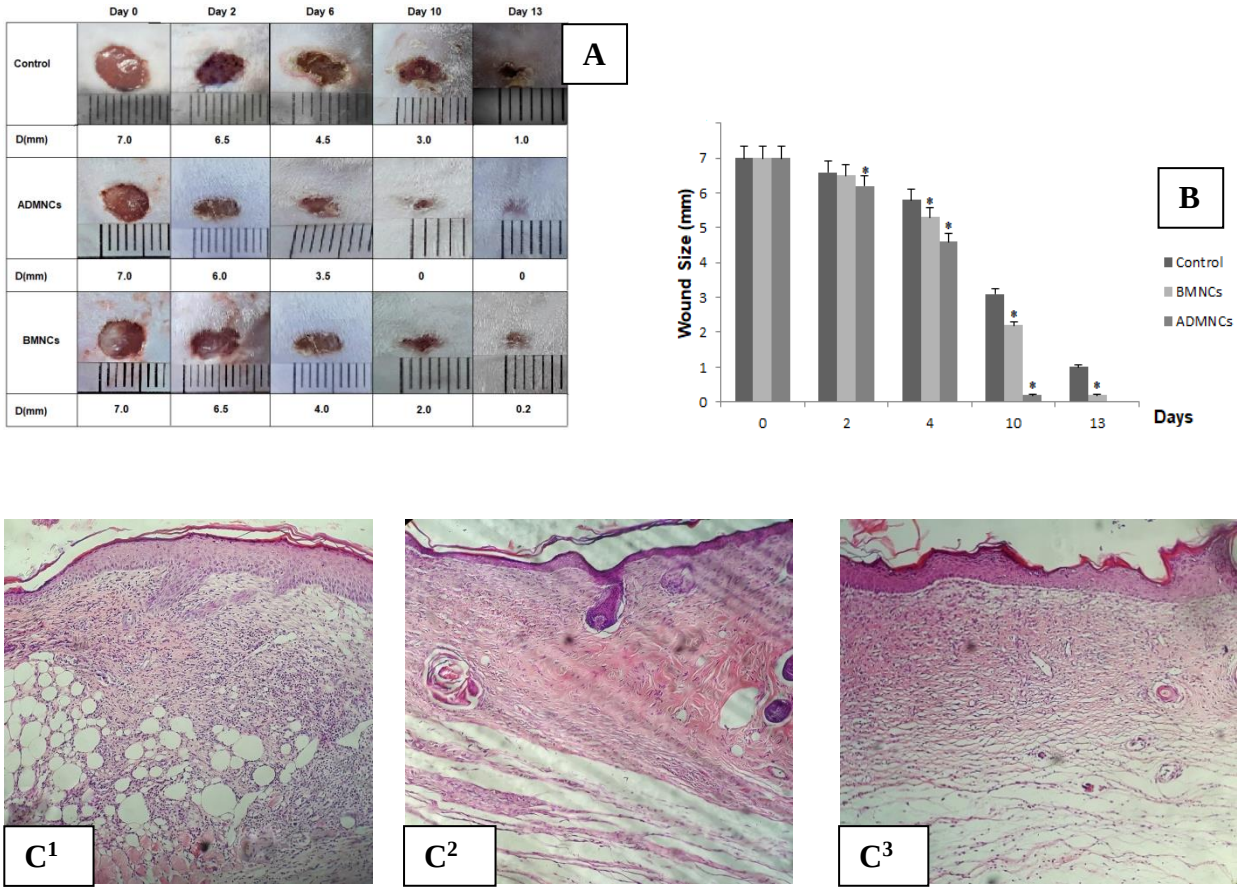


Figure 4. Effect of mononuclear cell on wound healing in mice

A. Wound morphology within 13 treatment days with mononuclear cell administration**, B.** Average wound size in different groups on days of treatment, **C.** Histological structure of different groups after 13 days, **C^1:** Control group sample, **C^2:** BMNCs group sample, **C^3:** ADMNCs group sample.

The histological result showed that BMNCs as well as ADMNCs group wound had thicker dermis layer, more fibroblast and inflammatory cells than control group. The control group had thin epidermis layer due to the loose granule tissue and abnormal granule tissue thickness. Whereas the mononuclear cell administrated group had a normal epidermis with the controlled proliferation.

The combination of *Piper betle* L. extraction and mononuclear cells

Fifteen mice after excision were divided into 3 groups. Group 1: NaCl injected group (Control). Group 2: 10^6 bone marrow mononuclear cells injected + *Piper betle* L. extraction (BMNCs+EX). Group 3: 10^6 adipose-derived mononuclear cells injected + *Piper betle* L. extraction (ADMNCs+EX). The morphology and histology result were showed in Figure 5.

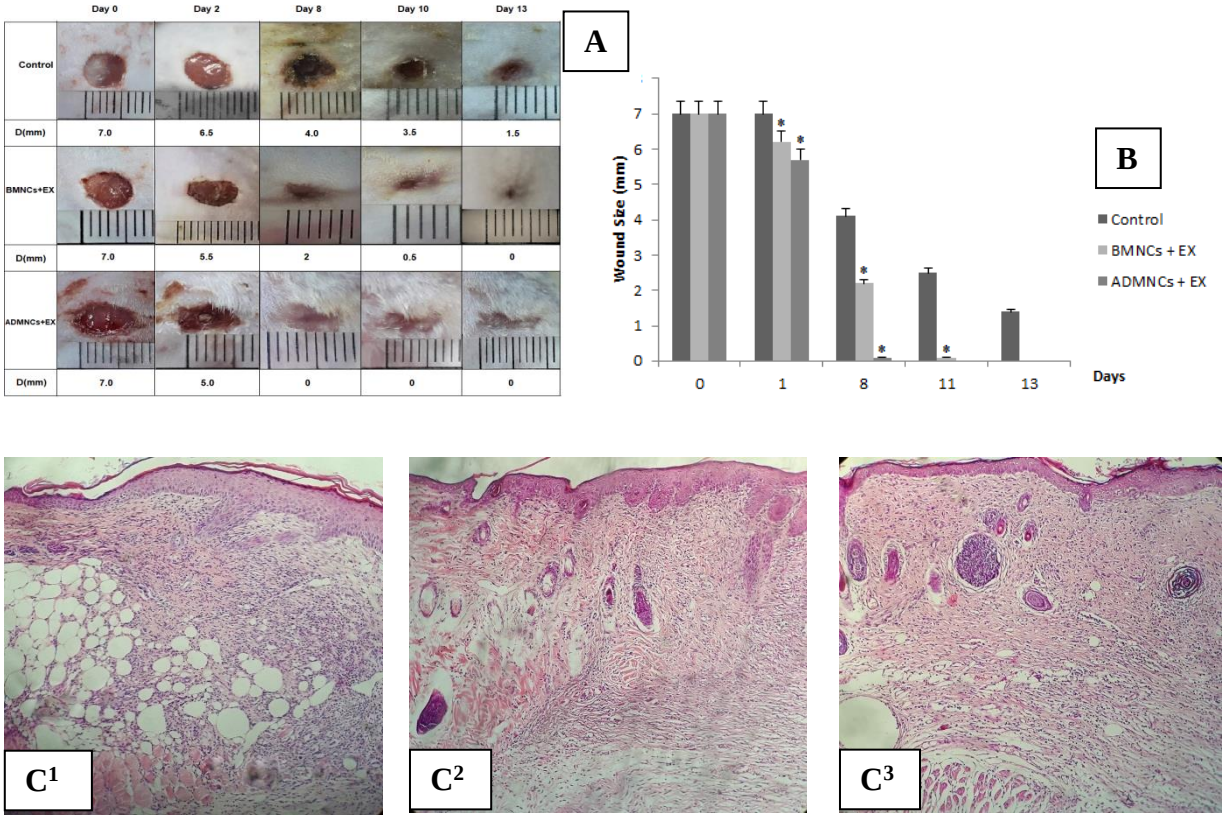


Figure 5. Effect of combination of Piper betle extraction and mononuclear cells to wound healing process

A. Wound morphology within 13 treatment days with combination of Piper betle extraction and mononuclear cell administration**, B.** Average wound size in different groups on days of treatment, **C.** Histological structure of different groups after 13 days, **C^1:** Control group sample, **C^2:** BMNCs+EX group sample, **C^3:** ADMNCs+EX group sample.

The wound of combination BMNCs+EX and ADMNCs+EX was initially dry in the first day. At the 4th day, ADMNCs+EX group wound was close as 1.6 times as control while the BMNCs+EX wound was close as 1.3 times as control. The wound was completely dry in both administrated group. The ADMNCs+EX group and BMNCs+EX wound was fully recovered at the 8th day and the 10th day, respectively. Both groups were significantly faster than control.

The model is obtained from the BMNCs+EX and ADMNCs+EX rats on the 13th day after the ulcers, the pattern is evaluated based on the stratum granulosum structure in mesoderm, epidermis floor structure and sub-structures such as hairfollicle and blood vessels. After 13 days of treatment, the epidermis normal and evenly, increased keratinocyte, fibroblast and blood vessels and hairfollicle more than the control group.

Hematology index and Liver, Kidney feature

The result was showed in the table below:

Table 3. Hematology index

Data	Internationl newspaper	Control	Betadine	EX	BMNCs	ADMNCs	BMNCs + EX	ADMNCs + EX
Erythrocyte ($1x10^6$)	8,66±0,36	8,66±0,22	7,7±0,2	7,67±0,25	8,23±0,22	8,3±0,3	7,78±0,15	7,8±0,2
White blood ($1x10^3$)	7,0 ± 1,4	6,53±2,1	6,52±2	6,72±1,2	6,82±2,1	6,8±2,1	6,87±1,1	6,9±1,2
Monocyte (%)	3,7±0,3	3,9±0,1	3,6±0,1	3,6±0,1	3,5±0,1	3,6±0,2	4,2±0,2	4,1±0,1
Lymphocyte (%)	68,5 - 73,1	74±1,1	73,2±1,2	72,7±1,0	74,9±1,1	73,5±1	73,9±0,6	74±0,8
Neutrophil (%)	19,7 - 21,8	20,3±0,2	20,6±0,3	22,6±0,1	20,5±0,2	20,5±0,2	20,9±0,8	20,3±0,6
Eosinophil (%)	0,8±0,2	0,8±0,1	1,1±0,15	1,1±0,2	0,9±0,1	0,8±0,15	0,9±0,3	1±0,1
Basophil (%)	0,13±0,23	0,2±0,01	0,1±0,02	0,1±0,02	0,2±0,01	0,2±0,01	0,1±0,02	0,1±0,01
Platelets ($x10^3$)	810±55,1	517±52,1	360±48,2	364±29,1	517±52,1	520±50,3	501±62,1	510±63

Table 4. Liver, Kidney feature index

Creatinine (µmol/L)	Urea (mmol/L)	AST (U/L)	ALT (U/L)
28±2	11,38±1,12	108±10	37±12

The hematology index and liver, kidney feature was still kept in standard level, which was concordant with the hematology index result of Restell (2014) and liver, kidney feature result of Van Hanh VU et al. (2014) [14], [15].

DISCUSSION

The effect of *Piper betle* L. extraction in wound healing process

In this study, in addition to tested anti-microbial potential, there were significant results for using *Piper betle* L. extraction to treat wound. As a extracellular signal, P. *betle* extraction supported the interaction of cells and stimulated cellular reaction for regulating the proliferation, migration and differentiation.

In the early state of acute wound, immune system would be highly activated. Nodes in the wound site are responsible for activating the white blood cells (mainly neutrophils) and macrophages to migrate and secrete cytokine, protein,… due to the chemotaxis mechanism.

A study of plant compound showed that there were the presence of ankaloid, steroids, tannin, phenolic, flavonoid, glycoside in Piper betle extraction [16]. In 1958, Gane N. investigated that steroid, terpenoid and phenolic derivation including coumarin, tannin and flavonoid could affect the proliferation and revascularization [17]. Especially, Hydroxychavicol, an important phenolic component in young Piper betle leaves, had strong anti-inflammation ability through inhibiting the expression of TNF-α, a pro-inflammation cytokine [18].

Corresponding to our results, Keat EC et al (2010) used the Piper betle extraction to treat the ulcer in mice model. The result significantly showed that the healing process of treated group was double faster than control after 10 days. We, therefore, recommend that *Piper betle* L. plays an important role in wound healing process [19].

The effect of mononuclear cells in wound healing process

Through histological result, there was up-regulation of granulation tissue and vascularization in both injury sites of BMNCs group and ADMNCs group. This could be explained by the stimulation of revascularization and fibroblast proliferation due to high expression of CD 146. In 2015, Cammarote and Laukkanen had also recommended the potential of enhancing revascularization and fibroblast proliferation of stem cell [20].

Wound morphology observation indicated that wound healing process of ADMNCs group had more positive changes than the BMNCs group and control. This, perhaps, would be explained by two main mechanism: trans-differentiation and paracrine regulation which is mentioned by Metral et al (2004) [21]. The ability of differentiating into fibroblast, especially young fibroblast, as well as the potential of secreting cytokine and growth factor helped promoting the fibroblast synthesis and proliferation. In addition, the ability of quickly re-epithelializing and wound healing of ADSC could be concordant with the up-regulation of CD90, which is a representative marker of keratinocyte. This acceleration of wound healing process in ADSC group is corresponding to the previous research of Rodrigez et al (2015) [22].

The effect of combination of Piper betle L. extraction and mononuclear cells in wound healing process

The observation of wound morphology as well as the healing time in both ADMNCs + EX and BMNCs+ EX was better than ADMNCs, BMNCs, EX and control. This could be explained that wound site in ADMNCs + EX and BMNCs + EX group was simultaneously supplied the anti-inflammation compound from *Piper betle* L. extraction and enhanced the administrated mononuclear cells to differentiate into skin cells. The interaction and collaboration of these two factor helped promoting wound healing process in both structure and feature.

In re-vascularization stage, in order to maintain the stability of regenerating blood vessels, cells must utilize the precursor cells expressing positively CD146+ [23]. These cells are probably more inclined to generate putative endothelial cells that enhance neoangiogenesis, microvascular network growth, and timely healing and also offer a source for pro-angiogenic cytokines [24], [25].

The ability of activating skin niche cells and stimulating their proliferation of administrated cells was explained through two proliferation marker: nuclear marker Ki67 and membrane marker CD71. The presence of CD71 in epithelial keratinocyte had been reported by Olszewski and Redvers [26], [27].

The superior potential in proliferation of ADSC compared to BMSC and the Piper betle extraction's ability of enhancing fibroblast proliferation could be the reason for greatly regenerating and healing in ADMNCs+EX group.

Marin et al (1997) reported that the re-epithelialization stage mostly depends on keratinocyte proliferation [28]. Several studies showed that transplanted adipose stem cells would be able to promoting keratinocyte proliferation through the evidence of up-expressing marker CD71 [29]. In addition, the previous study of Hilmi et al (2013) indicated that ADSCs have the ability of enhancing the proliferation of immortalized keratinocytes (HaCat cells) [30].

Expression of CD90 could be an explanation for the superior ability of ADSC in re-epithelialization and tissue regeneration [31]. Due to secreted paracrine factor from ADSCs, fibroblast and keratinocyte could migrate and proliferate [32]. Besides, *Piper betle* L. extraction not only effectively worked in skin surficial anti-bacteria that also stimulated *in vitro* fibroblast as well as accumulated protein at *in vivo* wound site [16], [19]. This is the theoretical explanation for faster wound healing process in the ADMNCs+EX group than in the other experimental groups.

Piper betle L. extraction and ADCS are considered as a paracrine signal to stimulate growth factor and cytokine such as VEGF, TGF-β, PDGF and KGF [33]. Consequently, that will enhance the proliferation and migration of keratinocyte in order to heal faster [34].

In two initial phases of wound healing (early inflammation phase and regenerating phase), the monocyte and macrophage cells are crucial elements [35]. An important stage in healing process is transformation of monocytes from pro-inflammation into anti-inflammation positively expressing CD163 phenotype, from which the inflammation and fibrosis are attenuated [36]. Under effects of stem cells and P. betle extraction, macrophage initially up-expressed CD163 and then played a key role in regulation signal pathway [18], [37].

- *Piper betle* extraction had ability of wound healing through anti-bacterial potential and promoting fibroblast proliferation.

- Administrated ADSCs helped stimulating wound healing process faster than BMSC and harmonically skin tissue regenerating.

- The combination of *Piper betle* extraction and ADSC could completely recovery the wound within 8 days with positive wound morphology. The structure of dermis, epidermis had no abnormalities.

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RÉSUMÉ:

COMPARAISON ENTRE LE POUVOIR DE GUÉRIR LES PLAIES PAR LE *PIPER BETTLE L.* EXTRAIT COMPRENANT LES CELLULES MONONUCLÉAIRES DE LA MOELLE OSSEUSE VERSUS CELLULES MONONUCLÉAIRES DU TISSU ADIPEUX

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Les cellules souches sont auto renouvelables et différentiées en d'autres cellules dans la réparation des plaies du corps. Les cellules souches peuvent être isolées différemment de plusieurs parties du corps. Pourtant, il y a peu de recherche dans la comparaison des effets différents de cellules souches différentes sur le processus de guérison. En plus, le *Piper betle L.* est connue comme un médicament de valeur qui guérit des plaies ouvertes par ses propriétés antibactériennes, anti-inflammatoires, et de stimulation de la prolifération des fibroblastes.

Cette recherche tente de montrer les effets des cellules mononucléaires de la moelle osseuse et du tissue adipeux aussi bien que leur combinaison, avec l'extrait du *Piper betle L.* dans le processus de guérison verifié par des changements morphologiques et histologiques.

Méthode: Après avoir provoqué l'ulcération chez la souris, on injecte dans la région caudale des cellules mononucléaires. Après deux heures, on applique l'extrait de *Piper betle L* à *10%* et la souris est suivie pendant 13 jours.

Résultats: La capacité de guérison des cellules mononucléaires du tissu adipeux était plus grande que celles provenant de la moelle osseuse. En outre, l'extrait du *Piper betle L.* à 10% associé aux cellules mononucleaires avait produit la guérison complète au bout de 8 à 10 jours respectivement. Les traitements cités ont été plus rapides que chez le groupe contrôle.

Mots clés: *Piper betle L., antimicrobial, wound healing, extraction, bone marrow mononuclear cell, (BMNCs), adipose-derived mononuclear cells (ADMNCs)*

RELATIONSHIP BETWEEN PRIMARY LESION FDG UPTAKE AND CLINICAL STAGE AT PET-CT FOR SMALL CELL LUNG CANCER PATIENTS

Huynh Quang Huy*

ABSTRACT

***Objective*:** Small-cell lung cancer (SCLC) accounts for 15%-20% of all lung cancer cases. PET-CT has become increasingly used as an initial staging tool in patients with SCLC. We aimed to explore the relationships between primary tumor 18F-FDG uptake measured as the SUVmax and clinical stage at PET-CT for small cell lung cancer patients (SCLC). ***Methods*:** Patients with SCLC who underwent 18F-FDG PET-CT scans before the treatment were included in the study at Bach Mai hospital of Vietnam, from November 2014 to May 2018. The primary tumor and secondary lesion SUVmax was calculated; the tumor size was measured; the T-N-M status was determined mainly by FDG PET-CT imaging according to The 8th Edition of the TNM Classification for Lung Cancer were recorded. An evaluation was made of the linear relationship between tumor size, T stage, N stage, and M stages of the patients and their SUVmax using Spearman's correlation. ***Results*:** 37 cases (34 men and 3 women; age range 38 - 81 years, median 64 years) were analyzed. The average of primary tumor size and SUVmax were 5.95±2.77 cm and 10.21±4.75, respectively. The SUVmax of primary tumor is significantly greater than that of nodal and distant organ metastasis (10.21±4.75 vs 8.20±4.35 and 6.44±3.17, p<0,01). There was a moderate correlation between SUVmax and tumor size (r =0.596, p<0.001), tumor stage (r = 0.502, p<0.01) but not significant with nodal stage (r =-0.218, p=0.194), metastasis stage (r = -0.055, p=0.747), and overall stage (r=-0.060, p=0.725).

Conclusion: SUVmax was significantly correlated with tumor size, but not with distant metastases or lymph node involvement. Therefore, SUVmax on positron emission tomography is not predictive of the presence of metastases in patients with SCLC.

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I. INTRODUCTION

Lung cancer is the leading cause of cancer death worldwide. Small cell lung cancer (SCLC) represented approximately 10-15% of all lung cancers [1], [10]. Smoking is the main risk factor for SCLC, approximately 95% of these patients were smokers [8]. SCLC is characterized by the low degree of differentiation, shorter doubling time and high sensitivity to chemotherapy and radiotherapy.

Each year, 13% of all newly diagnosed lung cancer patients are diagnosed with SCLC [3]. Approximately 39% of patients with SCLC are diagnosed with LS disease treated with chemotherapy and definitive radiation therapy. Staging information is essential because of the high propensity for metastatic disease in SCLC, and the identification of metastases can spare patients from the toxicity associated with thoracic radiotherapy. Furthermore, in those patients who do receive radiotherapy, knowing the exact extent of intrathoracic disease may permit more accurate treatment volume delineation.

PET has emerged in the last decade as an important tool in the staging and delineation of disease for conformal radiotherapy planning of non-SCLC. In 2009, Medicare approved the use of PET for the initial staging of SCLC [5]. It is believed that PET may more accurately

detect patients with extensive-stage disease than CT-staging alone [9].

According to the International Association of the Study of Lung Cancer, TNM staging is recommended, based on tumor, node, and metastasis staging, it is useful for the patients who are candidate for surgery.

The aim of the present study was to investigate the relationship between FDG uptake (SUVmax) and clinical stage for small cell lung cancer

II MATERIAL AND METHOD

2.1. Patient selection

The records of 37 patients newly diagnosed with SCLC between November 2015 and October 2018 at Bach Mai hospital were evaluated retrospectively. The subjects were examined by Fluorodeoxyglucose PET-CT and TNM stage of SCLC. A total of 34 males and 3 females were included in the study, with a mean age 62.0 ± 9.4 years (range 38-81 years).

Patients were excluded for the following reasons: primary lesion smaller than 1 cm (to ensure feasibility of PVC), histology could not be confirmed or was confirmed as other than SCLC, type I diabetes, prior history of lung cancer or other prior cancer within the previous 5 years, previous therapy or surgical staging for SCLC before PET.

2.2.Method

- Study design: retrospective

- FGD-PET imaging:

All patients underwent diagnostic and/or staging FDG-PET-CT prior to biopsy or therapy. Patients were asked to fast at least 6 h before the FDG-PET-CT scan. All patients had a glucose level below 180 mg/dl and were injected intravenously with 0.15-0.20 mCi /kg (7- 12mCi) FDG. At 45-60 min after the injection, data were acquired from the vertex to the upper thigh. Immediately after CT, a PET scan (PET/CT Biograph True Point - Siemens, Germany) was performed for about 25 min, with seven to eight bed positions and 3 min/position. PET images were reconstructed iteratively with CT data for attenuation correction, using an inline integrated Siemens Esoft Workstation system. Computerized tomography integrated positron emission tomography fusion images in transaxial, sagittal, and coronal planes were evaluated visually, and the SUVmax of lesions was obtained from transaxial images.

- CT Determination of Tumor Size

Tumor size was determined by averaging all 3 diameters of the primary tumor, measured on the mediastinal windows of the chest CT, using printed films. CT scans were obtained either at our institution or by the referring physician.

- Statistical evaluation

Nonparametric, rank-based statistical methods were chosen because none of our measurements (maxSUV, tumor size, TNM stage) could be assumed to have a normal distribution. Comparisons were therefore performed using a Kruskal-Wallis (KW) nonparametric test. Correlations between pairs of variables (i.e., maxSUV versus tumor size) were evaluated using the Spearman rank (SR) correlation test. All analyses were conducted using SPSS version 22.0.

III. RESULTS

The characteristics and SUVmax of the 37 SCLC cases are summarized in Table 3.1. When the cases were divided into three groups based on tumor size (group 1, < 3 cm; group 2, >3 cm and <5 cm; and group 3, > 5 cm), tumor SUVmax was differ significantly between groups 1, 2 and 3 ($p = 0.006$). Considering all cases, tumor SUVmax was not significantly correlated with age, gender or TNM overall stage.

Table 3.1. Characteristics and SUVmax of the NSCLC cases n (%) SUV (mean ± SD)

		n (%)	SUV (mean ± SD)	P value
Age				
	< 61	14 (37.8)	9.22 ± 4.03	0.287
	≥ 61	23 (62.2)	10.82 ± 5.12	
Sex				
	Male	34 (91.9)	10.28 ± 4.81	0.824
	Female	3 (8.1)	9.40 ± 4.76	
Tumor size				
	≤ 3 cm	6 (16.2)	5.47 ± 3.57	0.006
	> 3cm ≤ 5 cm	9 (24.3)	8.53 ± 4.49	
	> 5 cm	22 (59.5)	12.19 ± 4.02	
TNM overall stage				
	I, II	3 (8.1)	8.95 ± 8.08	0.446
	III	11 (29.7)	11.75 ± 4.19	
	IV	23 (62.2)	9.64 ± 4.60	

The average of primary tumor size and SUVmax were 5.95±2.77 cm and 10.21±4.75, respectively. The SUVmax of primary tumor is significantly greater than that of nodal and distant organ metastasis (10.21±4.75 vs 8.20±4.35 and 6.44±3.17, p<0.01) showed in the figure 3.1.

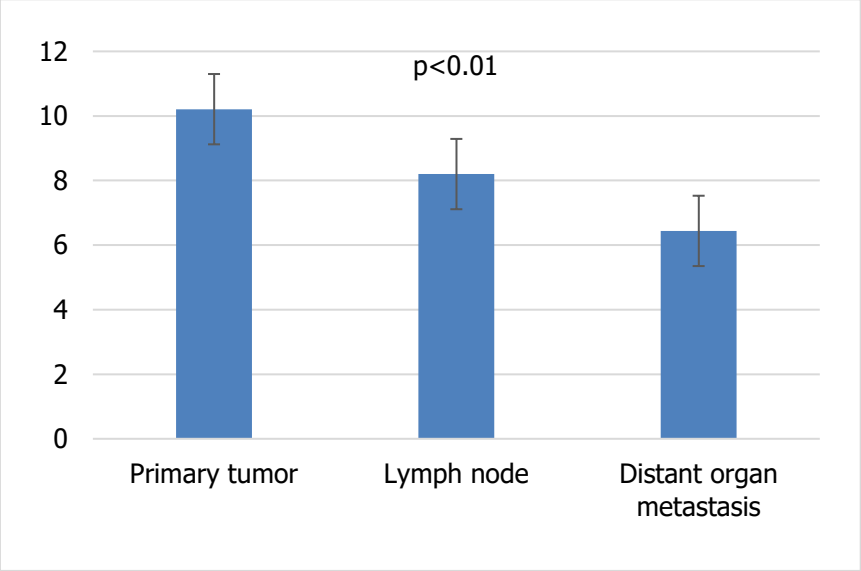

Figure 3.1. Comparison of SUVmax between primary tumors, lymph nodes and distant organ metastases

There was a moderate correlation between SUVmax and tumor size (r =0.596, p<0.001), tumor stage (r = 0.502, p<0.01) but not significant with nodal stage (r =-0.218, p=0.194), metastasis stage (r = -0.055, p=0.747), and overall stage (r=-0.060, p=0.725) in the figure 3.2, 3.3, 3.4, 3.5 and 3.6, respectively. The figure 3.7 show a case of SCLC with the primary tumor located at the left lung and figure 3.8; 3.9 are metastasis lesions.

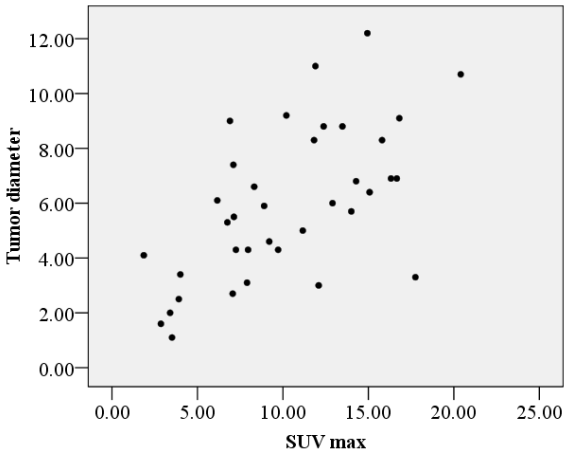

Figure 3.2. Correlation between SUVmax and tumor size (r =0.596, p<0.001)

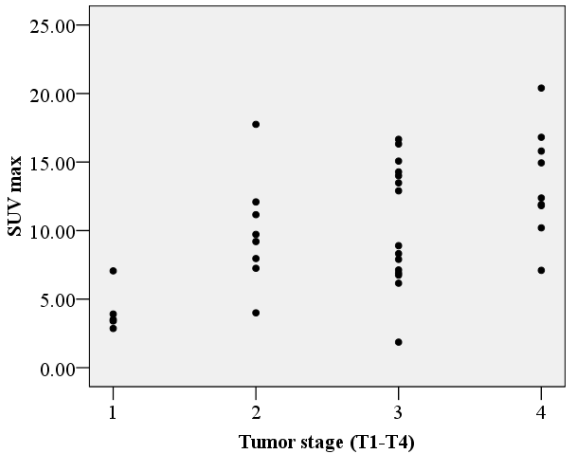

Figure 3.3. Correlation between SUVmax and tumor stage (r = 0.502, p<0.01)

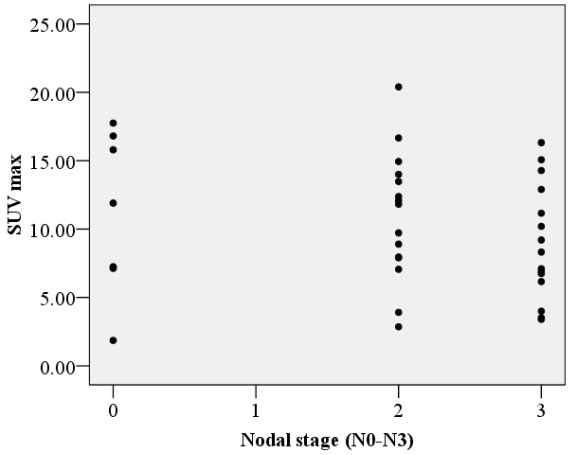

Figure 3.4. Correlation between SUVmax and nodal stage (r =-0.218, p=0.194)

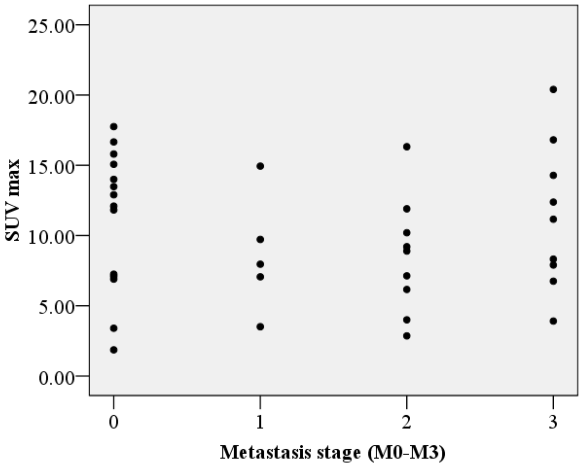

Figure 3.5. Correlation between SUVmax and metastasis stage (r = -0.055, p=0.747)

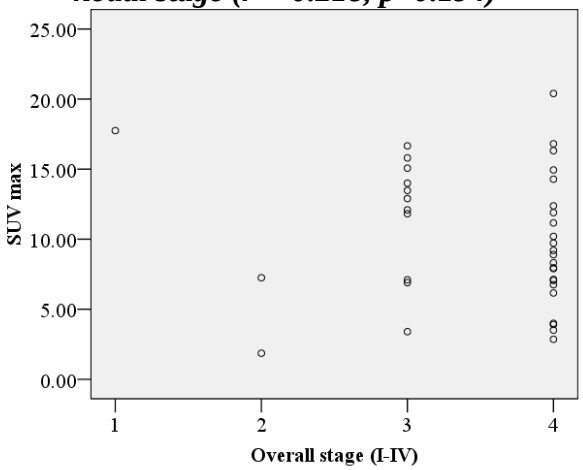

Figure 3.6. Correlation between SUVmax and overall stage (r=-0.060, p=0.725)

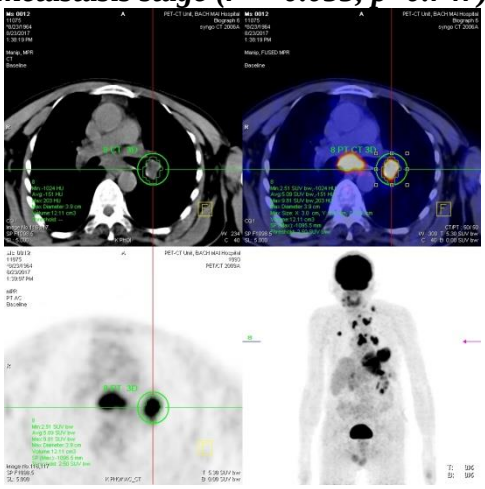

Figure 3.7. The primary tumor

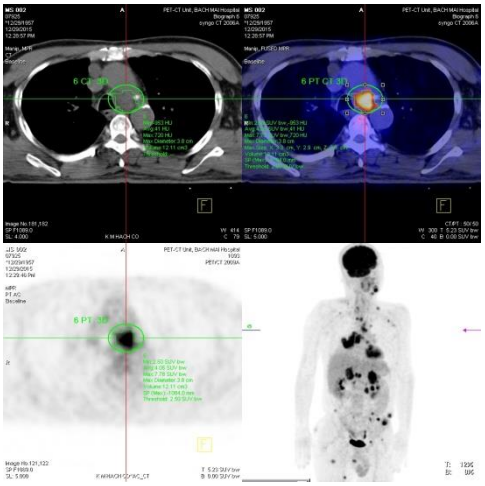

Figure 3.8. Mediastinal nodal metastase

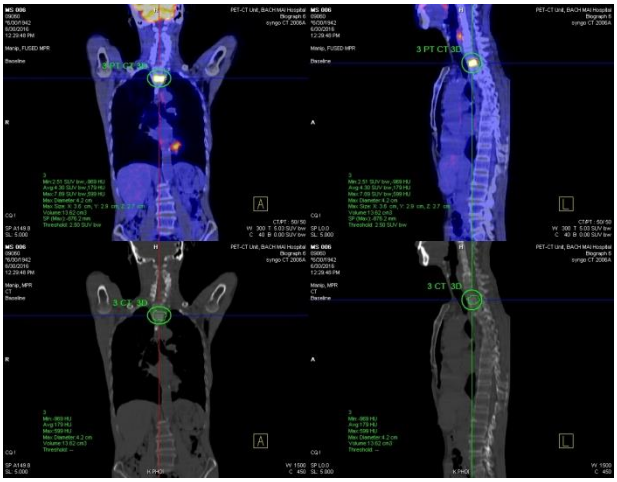

Figure 3.8. Spinal bone metastase

IV. DISCUSSION

Although CT or magnetic resonance imaging provides precise anatomical and morphological information, the role of FDG-PET-CT has increased for diagnosis and staging of lung cancer. Recently, FDG uptake has been reported to be a prognostic factor in patients with lung cancer [8]. Patz et al. [3] demonstrated that patients with positive FDG-PET-CT results in treated lung cancer had a significantly worse prognosis than patients with negative results. Therefore, we examined whether SUVmax correlates with tumor size, TNM stage in patients with SCLC. Tumor size, tumor stage but not lymph node or distant metastases, was related to the tumor SUVmax. Doom et al. [5] also reported a strong significant association between tumor size and SUVmax in patients with NSCLC. Another study in patients with stage I NSCLC showed a significant association between the primary tumor, SUVmax and tumor size, with tumors <3 cm having a significantly lower SUV than tumors > 3 cm [9]. Many studies regarding the correlation between SUVmax and other features such as histology, clinics in patients with NSCLC but no reports in SCLC has been found so far.

Fluorodeoxyglucose-PET-CT is already an indispensable modality for evaluating lymph node and distant metastases. Many reports have suggested that FDG-PET-CT is superior to CT in the accuracy of N- staging for lung cancer. Therefore, FDG-PET-CT is now regarded as the most accurate imaging modality for N- staging of lung cancer. However, a significant number of false-negative and false-positive findings of lung cancer, including N-staging, on FDG-PET-CT have been reported. Nambu et al. [7] demonstrated that the likelihood of lymph node metastasis increased with an increase in SUVmax of the primary tumor; for primary lung cancer with a SUVmax greater than 12, the probability of lymph node metastasis was high, reaching 70%, irrespective of the degree of FDG accumulation in the lymph node stations. They concluded that this finding would allow a more sensitive prediction of the presence of lymph node metastases, including the microscopic ones that cannot be detected by direct evaluation of lymph node stations. Consistent with these results, Higashi et al. [6] documented in a

multicenter study that the incidence of lymphatic vessel invasion and lymph node metastasis in NSCLC were associated with 18 F-FDG uptake, concluding that 18 F-FDG uptake by a primary tumor is a strong predictor of lymphatic vessel invasion and lymph node metastasis. In the present study, although tumor SUVmax was higher in patients with lymph node metastasis than in those without, the difference did not reach statistical significance. We also observed that the frequency of lymph node metastasis was higher in adenocarcinomas (80.2%) than in squamous cell carcinomas (71.4%), suggesting that pathological subtype may be a significant factor associated with lymph node metastasis. In contrast, a previous study showed no difference in the frequency of lymph node metastasis between the two pathological subtypes.

Based on univariate analysis, Jeong et al. [6] concluded that metastasis detected by PET imaging, which can affect staging by aiding in the discovery of metastasis to contralateral lymph nodes or distant organs, was an insignificant factor, and that metastatic findings on PET had weak discriminative power. According to Cerfolio et al. [2], FDG-PET-CT does not replace the need for tissue biopsies for staging N1 or N2 lymph nodes, or metastatic lesions, as false positives and false negatives were observed in all stations in their study. However, FDG-PET-CT resulted in better patient selection before pulmonary resection. FDG-PET can also help in targeting areas for biopsy and identifying unsuspected N2 and Ml disease. In the present study, tumor SUVmax was not significantly correlated with distant metastases. This may be attributable to the finding of increased 18 F-FDG uptake by subclinical inflammatory lesions as well as by malignant tumors.

V. CONCLUSIONS

SUVmax was associated with tumor size, tumor stage but not with distant metastases or lymph node involvement. Thus, SUVmax determined by FDG-PET-CT is not predictive of the presence of metastases in patients with SCLC. Larger prospective and randomized analyses may potentially reveal more significant relationships.

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RÉSUMÉ:

RELATIONS ENTRE LA PRISE DU FDG PAR LA LÉSION PRIMITIVE ET LE STADE CLINIQUE MESURÉ AU PET-CT POUR LES PATIENTS AYANT UN CANCER DU POUMON À PETITES CELLULES

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Objectif: Le cancer du poumon à petites cellules occupe 15-20% de tous les cas de cancer. Le PET-CT est devenu de plus en plus un instrument de mesure de stade pour le cancer du poumon à petites cellules. Notre but était de trouver des relations entre la prise du 18F- FDG par la lésion primitive, le SUVmax et le PET-CT étant utilisés pour etablir le stade de la maladie du patient atteint de cancer du poumon à petites cellules.

Méthodes: Les patients avec cancer du poumon à petites cellules qui sont soumis à l'examen au 18F-FDG, PET-CT, avant le traitement entrepris à l'hôpital Bach mai de Novembre 2014 à Mai 2018. Le SUVmax de la tumeur primitive et la lésion secondaire a été mesuré, le stade T-N-M étant evalué surtout par l'imagerie du FDG PET-CT d'après la 8e Edition de la Classification TNM du Cancer du Poumon. On a retrouvé une relation linéaire entre la grosseur de la tumeur, le stade T ou N ou M de la maladie, et leur SUVmax utilisant la corrélation de Spearman.

Résultats: 37 cas (34 hommes et 3 femmes, âgés de 38 à 81 ans, moyenne 64 ans, ont été analysés. La grosseur moyenne de la tumeur et le SUVmax étaient 5.95 ± 2.77cm et 10.21 ± 4.75, respectivement. Le SUVmax de la tumeur primitive est significativement plus grand que la métastase nodale ou d'organe distant (10.21 ± 4.75 vs 8.20 ± 4.35 et 6.44 ± 3.17, $p < 0.01$). Il y a une corrélation modérée entre le SUVmax et la grosseur de la tumeur ($r = 0.596$, $p<0.001$), le stade de la tumeur ($r = 0.502$, p,0.01), mais il est sans signification au stade nodal ($r + 0.218$, $p = 0.194$), au stade de la métastase ($r = - 0.055$, $p = 0.747$), et en général ($r= -0.060$, $p = 0.725$).

Conclusion: SUVmax variait en relation avec la grosseur de la tumeur, mais pas avec les métastases distantes ou lorsque des adénomes y sont impliqués. Par conséquent le SUVmax

ou la tomographie utilisant l'émission de positron n'a pas de valeur prédictive de métastases chez le patient avec cancer du poumon à petites cellules.

EVALUATION OF THE ROLE OF THE LASIX TEST IN RETROPERITONEALLY LAPAROSCOPIC PYELOLITHOTOMY FOR TREATING URETEROPELVIC JUNCTION OBSTRUCTION

Nguyen Duc Minh*, Nguyen Huy Hoang*,
Hoang Long*, Vu Nguyen Khai Ca*

ABSTRACT

Statement: Retroperitoneally laparoscopic pyelolithotomy (RLP) for treating ureteropelvic junction obstruction (UPJO) is widely used in the world. However, the authors have not mentioned Lasix role, which is to detect precisely the narrow position and the cause. Our study aimed to assess the role of Lasix test while performing RLP for UPJO at the Viet Duc Hospital's Department of Urology. **Research subjects and methods**: Prospective description of 60 patients with RLP treated for UPJO from August 2012 to August 2017 in which 20 patients needed to use the Lasix test in surgery. **Result:** The study included 13/20 male patients which took up 65% and females accounted for 35%. The mean age was 32.4 ± 15.7 years (17- 57 years). There were 9 patients having right intervention and 11 patients having left intervention. Average surgery time is 105.42 ± 21.67 minutes (55 - 130). Lasix intravenous with one tube of 20mg and the average waiting time of lasix is 15 minutes (8-30 minutes). Average blood loss amount in surgery is 33.15 ml (10 - 90). Average hospital stay is 3.8 ± 1.3 days (3 - 6). There are 14 cases detected with UPJO whose cause is intrinsic, the junction of the ureteral vessels should be cut and shaped JJ.There are 6 cases whose cause is having small abnormal blood vessels tamponading after cutting abnormal vessels without cutting - jointing - shaping ureter. Pathology of narrow section after surgery at 14 patients having cut and joint treatment: 100% patients' jointed segment was fibrosis. **Conclusion:** The Lasix test is needed in certain cases, allowing the surgeon to determine the cause of the stenosis, accurately assessing the narrow position for appropriate treatment.

Key words: *Ureteropelvic junction obstruction, retroperitoneally laparoscopic pyelolithotomy, Lasix test.*

I. STATEMENT

Ureteropelvic junction obstruction (UPJO) is a congenital malformation caused by surgery or a function that causes narrowing of the artery to obstruct the flow of urine from the renal pelvis to the ureters causing stasis at kidney, in long-term will lead to impaired kidney function. At present, the development of early diagnosis of prenatal diagnosis has improved the incidence of childhood disease but the majority of cases have developed diminished, the symptoms usually appear at young-aged, middle-aged or even later [3]. Treating UPJO with open surgery based on the Anderson-Hynes method known with over 90% success rates [1]. However, the patients suffered from a large incision, resulting in aesthetic effects, big psychological traumas due to open surgery and prolonged postoperative period. Besides, ureter laparoscopic surgery, widen the narrow segments are also used to treat this disease. Nevertheless, the success rate is

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lower than open surgery by 10-20%, especially in case of renal tubular hypertension or dramatically decreased kidney function. In addition, this method contraindicated in case of abnormal blood vessels compressed due to the risk of bleeding during and after surgery.

Laparoscopic surgery of the abdominal cavity shaping narrow UPJO was first described in 1993 by Schuessler and Kavoussi [6], [7]. In 1996, Janetschek G reported the first use of RLP to shape UPJO [4]. Today, this method has been widely applied in the world and is a good alternative to traditional open surgery [2], [10]. The RLP technique was used in the Department of Urology at the Viet Duc Hospital since 2007 and achieved initial encouraging success. In the course of many surgeries, we noticed two problems. First, some patients on the CT scan prior to surgery for renal pelvis were dilated, but not much. When the surgery saw straight UPJO axis, after the release of retroperitoneal fibers and abnormal small blood vessels compressed but the renal pelvis was not dilated at that time.We assumed that the stenosis was due to external causes and decided to remove the veins or cut the blood vessels and did not form. Later on, when monitoring these patients, we found that most of them had to place JJ upstream soon after surgery and then retook the open surgery to reconnect and reshape the renal pelvis and ureter. Second, there were some patients whose renal pelvis were slightly clearer, but since the UPJO axis is straight, it is difficult for us to accurately detect the boundaries between the healing and the narrow segments for the removal. From the above two issues we reconsider that it is necessary to take measures to accurately determine the narrow position, and what causes the narrowing, either from inside or outside. And lasix therapy has helped us solve these two problems effectively.

We conducted this study aiming at:

1. Assessment the lasix therapy's role in the treatment of UPJO pathology by RLP.

2. Assign the shaping of the pelvis ureteric junction in RLP.

II. SUBJECTS AND RESEARCH METHODS

1.Research subjects

60 patients were diagnosed with UPJO with adequate clinical data and assessed for pathological lesions by computer tomography (CLVT) 64 and were treated by RLP, in which 20 patients had Lasix test in surgery.

The study did not include patients with UPJO contradicted with RLP or getting UPJO after surgery.

2.Methods

Descriptive studies of 20 patients with UPJO treated with RLP using Lasix test in the Department of Urology of the Viet Duc Hospital from 8/2012 to 8/2017.

3. Procedure

Preoperative assessment: Age, gender, the side of ureteric pelvis junction.

RLP procedure: patients lied 90 degrees to the opposite side, padded under the waist, got endotracheal intubation anesthesia. Surgeon and asistant stood behind patient.

Set the first 10mm trocar on the midaxillary line, 1cm from the crest of ilium, created postpartum cavity by a finger of gloves with 500 - 800ml, inflatable pressure 12mmHg. Then placed the second trocar (5mm) on the anterior axillary line in the middle of the crest of ilium and the ribs, placed the third trocar (10mm) on the ribs below the ribs no.12, and place the fourth

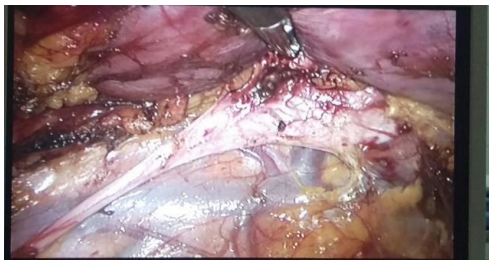
trocar at the corner of the ribs. The renal pelvis-ureter was exposed at the outside of the pelvic muscles.

Using dissection to seek renal pelvis and ureter in these 20 patients, we found that renal pelvis was not as dilated as it was on film or it was very thin, and difficult to see clearly. After the release of the ureter, cutting the fibrosis or ligaments and abnormal vessels (if any), the renal pelvis has not changed much. We injected one Lasix 20mg intravenously for HTM 9%, waited about an average of 15 minutes (8-30), fast or slow depending on the patient. Then we observed the morphological changes of renal pelvis. The surgery also recorded the time of surgery, abnormal blood vessels, blood loss and complications in the surgery.

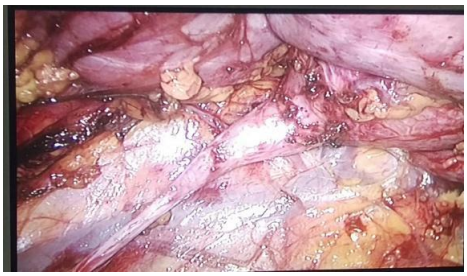
Evaluating the results in surgery:

- If renal pelvis stretched after giving the lasix, the narrow position was determined, we decided to cut and shape, when cutting the ureter we cut it in the lower position under the presumed narrow position. After cutting, we observed urine flowing through the narrow area and found that although the renal pelvis is very stretched, but the urine almost did not flow through the cut or just drip leakage, so we determine accurately narrow and accurate position narrow (Patient number 1,2). We cut the narrow segment and sent for anatomic pathalgy.

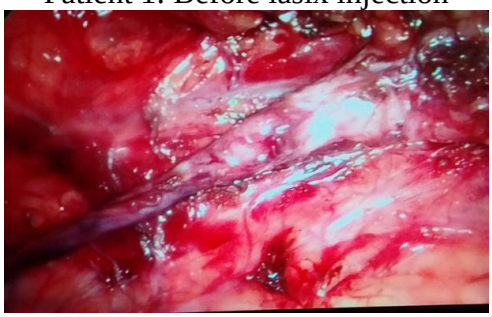
- If the shape of renal pelvis did not change and stretch, we would wait 30 minutes and decide not to shape (Patient No. 3)



Patient 1: Before lasix injection

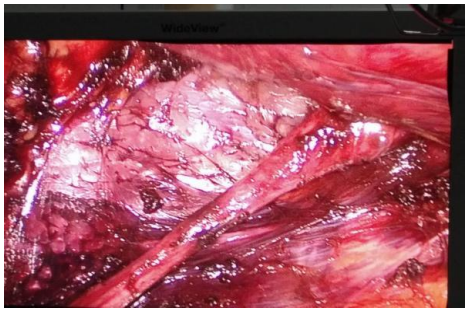


After laser injection

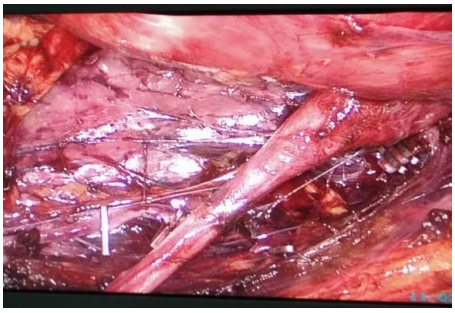


Patient 2: Before lasix injection

After laser injection



Patient 2: Before lasix injection



After cutting the crossing vessels and using laser injection

Evaluation of postoperative results

After surgery, patients are given antibiotics, withdrawn the urine and leave the hospital after 3-5 days. Evaluation of hospital stay, dilation time, surgical complication, JJ withdrawal time.

The first check-up appointment was 1 month after the surgery. Patients had ultrasound scan for the urinary system, intravenous urography, the necessary cases can be computerized tomography or urethral shoots - upstream kidney to test. The 2nd revision is 3 months after the surgery. Revision 3 is 12 months after surgery.

The operation would be effective when patients' clinical symptoms were gone, their ultrasound scan showed the pyelonephritis decreased, and the film showed the contrast media went to the ureter and there was a significant improvement in kidney function showed on multi-sequence computerized tomography (MSCT).

III. RESULTS

- In 60 patients with RLP, there were 20 patients had to use Lasix in surgery
- The study has 13/20 male patients accounting for 65% and females took up 35%.

Table 1. Characteristics and surgery results of 20 patients using Lasix test

Variable	Value
Average age (years)	32,4 ± 15.7 (16 - 57)
Male/ Female	33/7
Operation side (R/L)	9/11
Unusual vessels n (%)	16(21,7)
Pressed fiber n (%)	4 (3,3)
Average operating time (minutes)	105,42 ± 21,67
Blood loss during surgery (ml)	33,15 ± 18,72 (10 - 90)
Average drainage time (days)	2,5 (2 - 4)
Length of stay (day)	3,8 (3 - 6)

- The average age was 32.4 ± 15.7 years (17 to 57 years).
- There were 9 patients having right-hand intervention and 11 patients having intervention in the left.

- There were 14 cases had the dilatation very clear after laser injection from 8 to 15 minutes, the narrow position was shown accurately, then we decided to cut, connect and shape the renal pelvis and ureter. There were 6 patients whose renal pelvis shape did not change after 30 minutes, no further expansion occured, then we decided to only remove the adhesive and not cut and shape.

- Anatomic pathalogy after surgery for all 14 patients having fibrotic stenosis.

- Average surgery time is 105.42 ± 21.67 minutes (55 to 130 minutes).

- The mean blood loss during surgery was 33.15 ± 18.72 ml (from 10 to 90 ml). No cases of bleeding after surgery.

- No patients have fever after surgery.

- The average time for drainage of nephrostomy tube is 2.5 days (from 2 to 4 days).

- The mean hospital stay was 3.8 ± 1.3 days (3 to 6 days).

- All patients were re-examined for 1 month with all 20 cases giving good initial results on ultrasound scan and JJ withdrawal.

- 20 patients were re-examined after 3 months, in which the number of patients having good results accounted for 95%, patients clinical symptoms were gone, ultrasound scan showed the kidneys were smaller than that before operation, the MSCT showed the medicine flowing through the ureter-pelvis junction and kidneys function improved, a patient with no clinical symptoms but through ultrasound scan and MSCT, the kidney still dilated.

- 19/20 patients were re-examined after 12 months, in which those having good results accounted for 95%: clinical symptoms were gone, the kidney had good results according to the ultrasound scan.

IV. DISCUSSION

Up to now, the procedure for treating UPJO has been widely applied with a success rate of about 95% [3] and is considered the gold standard for treating the disease. However, the patients suffered from a large incision, resulting in aesthetic effects, big psychological traumas due to open surgery and prolonged postoperative period. Laparoscopic surgery has a great advantage in terms of length of surgery and short hospital stay, but the success rate of this method is lower than open surgery by 10-20%. In addition, complications of postoperative bleeding may occur in cases of abnormal blood vessels.

After a long follow-up, the rate of success were lower due to the high risk of recurrence. In our opinion as well as some other authors', the indication of this method should apply in the case of elderly patients with contraindications for laparoscopic abdominal surgery and especially in case of UPJO reoccur. Using laparoscopic surgery of the Abdomen to treat the UPJO was initiated and developed to overcome the disadvantages of the above methods. Trans peritoneal and retroperitoneal laparoscopic pyelolithotomy have all the advantages of minimally invasive surgery such as postoperative analgesia, short hospital stay, overcoming aesthetic problems but success rates, according to many reports, are similar to open surgery. In addition, after long-term follow-up, the success rate was maintained [5], [8], [10].

The laparoscopic surgery of the abdomen method for UPJO has been applied since 1993 and is increasingly widely used. The majority of early reports refered to trans

peritoneal laparoscopic pyelolithotomy due to the wide cavity, wide viewing angles. However, peritoneal manipulation has the potential to damage the internal organs of the abdominal cavity, especially gut, even more difficult due to the renal pelvis is exposed because of the renal vein when entering from the front. Moreover, when the complications of urinary leakage after surgery, the consequences and management will be much more difficult. Perimenopausal laparoscopic surgery was introduced in 1996. Although the retroperitoneal cavity was limited, it allowed direct access to ureter and pelvis, thus shortening the duration of surgery.

The mean duration of surgery in our study was 95 minutes, which was similar to that reported by other authors [8], [10] and was shorter than the time taken by trans peritoneal laparoscopic pyelolithotomy [5].

Why do we have to use Lasix in surgery? This is purely due to the fact. Most of the UPJO cases, after seeing clearly renal pelvis and ureter, the upper renal pelvis stretched appropriately with the CT scan of 64 rows and / or folding angles created by the middle axis of the renal pelvis and the ureter was the sharp angle, then these patients would have to cut and shape without the Lasix test. But among them, there were patients after dissection, renal pelvis did not clearly stretch and the axis between renal pelvis and ureter was aligned, after releasing renal pelvis and ureter, cutting small abnormal blood vessels or peritoneal fibrosis, the renal pelvis form still did not change or changed very little. At first, we thought this was caused by the external pressure and did not cut and shape. After postoperative examinations, these patients most had to reset the JJ after surgery and have open surgery to cut and shape.

Therefore, we thought there must be other main triggers causing narrowing, specifically the cause from the inside of renal pelvis and ureter, not merely the outside one. So if there was a cause inside, then why the renal pelvis did not stretched. This is explained by the fact that all patients with UPJO syndrome are completely impaired, still had urine flow down to the ureter, but the rate was slow and the flow was small compared to normal. However, the narrow levels depend on cases, patients having renal pelvis extensive dilatation right after the dissection are usually very narrow and there is no need to discuss about cutting or conservative stickiness removing.

As for the remaining patients, they had a lower narrow level, circulation was better, then the urine output normally created was not clear. We used lasix 20mg for intravenous injection for these cases combined with rapid infusion of 0.9% natriclorite, waiting an average of 15m (8-30). There were 14 patients got their renal pelvis stretch very clear after the lasix injection, then we decided to cut and shape. 100% postoperative anatomic pathalogy in patients having fibrous joint obstruction. There were 6 patients with abnormal circulations running through, we cut abnormal vessels and injected lasix, after waiting 30 minutes, the renal pelvis unchanged, urine flowed through well and we decided not to shape. Thus, the role of lasix was extremely vital in these cases.

The lasix test also specifies non-surgical cases that significantly shorten surgery time.

We had no bleeding complications during and after surgery, the blood loss during surgery was less than 100 ml. There was only one case having urinary tract infections but need treatment only in medical. Our study

did not report any postoperative bleeding. In other studies, follow-up during and after treating UPJO by RLP rarely results in severe complications. The most common complications are prolonged urine leakage reported by some authors which took up 12 - 20% [4].

The results of the surgery were considered successful when patients clinical symptoms were gone, the ultrasound scan showed the pyelonephritis decreased, and the contrast media could go to ureter or kidney's function improved.

We reviewed after 1 month, 3 months and 12 months for all patients with successful initial results in 19 out of 20 patients, reaching 95%. According to the above criteria, good results are equivalent to the results of some other authors [8].

V. CONCLUSION

With definitive results to accurately diagnose lesions in the surgery, the role of Lasix is essential in using RLP for treating UPJO. RLP has achieved the same results as open surgery, while still retained the advantages of minimally invasive surgery, this is the first choice to be prescribed for treating the UPJO and can be widely applied in current conditions.

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RÉSUMÉ:

VALEUR DU TEST AU LASIX DANS LA PYÉLOLITHOTOMIE RÉTROPÉRITONÉALE LAPAROSCOPIQUE POUR LE TRAITEMENT DE L'OBSTRUCTION DE LA JONCTION URETÉROPELVIENNE

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Hoang Long*, Vu Nguyen Khai Ca*
**Hopital Viet Duc*

Position du problème: La pyélolithotomie rétropéritonéale laparoscopique (PRL) pour le traitement de l'obstruction de la jonction uretéropelvienne (OJUP) est bien appliquée à travers le monde. Pourtant, les auteurs n'avaient pas mentionné le rôle du Lasix qui aide à la détection précise du rétrécissement et sa cause. Notre étude a pour but d'évaluer le rôle du test au Lasix dans la pyélolithotomie rétropéritonéale pour le traitement de l'obstruction de la jonction uretéropelvienne au département d'Urologie de l'hôpital Viet Duc

Sujets et méthode: L'étude descriptive et prospective chez 60 patients avec PRL traités pour OJUP du mois d'Aout 2012 a Aout 2017, dont 20 patients nécessitaient le test au Lasix pour la chirurgie.

Résultat: L'étude comprenait 13/20 hommes (65%) et de femmes (15%). L'âge moyen 32.4%±15.7 années (17-57 années). 9 patients étaient opérés à droite, et 11 patients à gauche. La durée chirurgicale 105.42±21.67minutes (55-130). Le Lasix par voie intraveineuse à raison de 20mg, et le durée moyenne pour l'attende pour le Lasix est de 15 minutes (8-30minutes). La perte de sang moyenne pour la chirurgie est 33.15ml (10-90). La séjour hospitalier moyen 3.8±1.3 jours (3-6). La cause est intrinsèque chez 14 cas d'OJUP, la jonction des vaisseaux uretéraux devait être coupée, et les vaisseaux faconnés suivant la forme de l'uretère, 6 cas sont dus à la présence de vaiseaux anormaux de petit calibre, qui présentent une tamponade après la coupure des vaisseaux anormaux, et ce sans coupure-reliure-arrangement des uretères. La pathologie de la partie rétrécie après chirurgie chez les 14 patients ayant recu le traitement sous forme de coupure et de reliure: 100% présentent la fibrose.

Conclusion: Le test au Lasix est nécessaire dans certains cas qui permettent au chirurgien d'établir la cause de la sténose, et de déterminer la position du rétrécissement pour un traitement approprié.

Mots clés: *Ureteropelvic junction obstruction, retroperitoneally laparoscopic pyelolithotomy, Lasix test.*

THE RESULTS OF DURATION OF SURVIVAL IN THE TREATMENT OF ESOPHAGEAL CANCER STAGE III, IV BY CHEMISTRY RADIATION THERAPY AT NATIONAL CANCER HOSPITAL

Nguyen Duc Loi* et al

ABSTRACT

Through the research on 132 patients with esophageal cancer who were treated with concomitant Chemistry Radiation between 2009 and 2013, we draw some conclusions as follows:

1. Patient characteristics

- The age seen in high ferquency from 40 to 59 with the ratio of men to women at 65:1
- Squamous cell carcinoma accounts for 100% of esophageal cancer

2. Results

- The 12-, 24- and 36 months overall duration of survival rates are 92,7%. 48,2% and 30%, respectively.
- The 12-, 24- and 36 months duration of survival rates according to size of tumor larger than 5cm are 83,4%. 30,3%, and 9%; tumor smaller than 5cm are 94,6%, 54,1%, 37%, respectively (P= 0.003)
- The 12-, 24- and 36 months duration of survival rates with stage III of esophageal cancer are 93,4%, 50,6% and 33,3%, respectively and with stages IV are 88,9%, 35,1% and 11,7% respectively (P= 0.05).
- Additional chemistry therapy dose: 24 months, 36 months

+ Patients at <80%: 30.7%, 6.9%.

+ Patients with a dose of ≥ 80%: 55.1%; 39.2%; With P = 0.003

- Dependent on complete treatment: 24 months, 36 months

+ Excellent treatment group: 86.7%; 70.5%.

+ Indeterminate treatment group: 40.1%; 11.6%; With P <0.001

- Depends on esophageal stricture after radiation therapy: 24 months, 36 months

+ Stage 0 stenosis: 49.4%; 37.7%.

+ Stage 1 stenosis: 55.5%; 22.5%; With P <0.001

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I. INTRODUCTION

Esophageal cancer ranks third in gastrointestinal cancer after colon cancer and gastric cancer. The rate of esophageal cancer have been reported in northern China, the northeastern Caspian Sea, Russia, and France is 10-36 per 100.000 population, in Japan it is 6-14 per 100.000 population, and this rate is very high in Iran, in the United States it ranked 15th. In particular in Vietnam, according to Nguyen Ba Duc et al., the incidence of esophageal cancer in Hanoi in males is 8,7 per 100.000 population, and in females is 1,7 per 100.000 population; it ranked the fifth in 10 popular cancers in Vietnam. Men are more common than women. Age ranges from 50 to 60. According to the study of Pham Duc Huan, the rate of male/female is 15.8.

Although there are great advances in early detection, diagnosis as well as progress in treatment, the prognosis for esophageal cancer is also very poor. According to an European study, the 5-year survival rate was 5%, in the 78 years was 80.9%, in the 87 years was 89.10% (1991-2001). According to the research of Han Thanh Binh, the overall survival rate of radiation therapy after 12 months was 20.93%, and after 24 months was 9.33%. Treatment for esophageal cancer

mainly depends on the stage of the disease and the patient's condition. For the early stage, surgery is the main. In the late stage, progressive and metastasis, chemistry radiation therapy should be combined, and at the same time is a common trend in the treatment of esophageal cancer in the world.

In Vietnam, there is no study about evaluating the duration of survival in the treatment of late stage esophageal cancer by chemistry radiation therapy. Therefore, we proceed with this topic for the following purposes:

"The results of duration of survival in the treatment of esophageal cancer stage III, IV by Chemistry Radiation Therapy at National Cancer Hospial".

II. MATERIALS AND METHODS

Patients diagnosed with stage III and IV esophageal cancer were treated at National Cancer Hospital from September 2009 to September 2013, according to the classification of the Union for International Cancer Control 2004 (UICC-2004). Patients treated for the first time. Patient status is good with ECOG 0-2 or Karnofsky> 60%. Esophageal biopsy is squamous cell carcinoma or adeno carcinoma. Patients who do not have serious acute and chronic diseases are at risk of dying in the near future, and are without any cancers other than esophageal cancer. And patients have full records. Besides, patients with stage I, II and III treated by surgery or those with left untreated disease or bad patients with ECOG 3-4 and Karnofsky<= 60%, will not be included in this study.

Our method is descriptive research methodology with total of 132 patients. We collected information about the following characteristics: age, gender and duration of survival. We processed the data using computer software SPSS 14.0, and analyzed the results according to the medical statistical method, and Kaplan Meler's time estimation method.

III. RESULTS

Table 1: Patients's Age and Gender

Age	Patients	Rates (%)
<40	1	0,8
40 – 49	32	24,2
50 – 59	67	50,8
60 – 69	27	20,5
>70	5	3,7
Total	132	100%
Gender	**Patients**	**Rates (%)**
Males	130	98,5
Females	2	1,5
Total	132	100%

Table 2: Esophageal cancer histopathology

Histopathology	Patients	Rates (%)
Squamous cell carcinoma (SCC)	132	100
Adeno carcinoma (AC)	0	0
Total	132	100%

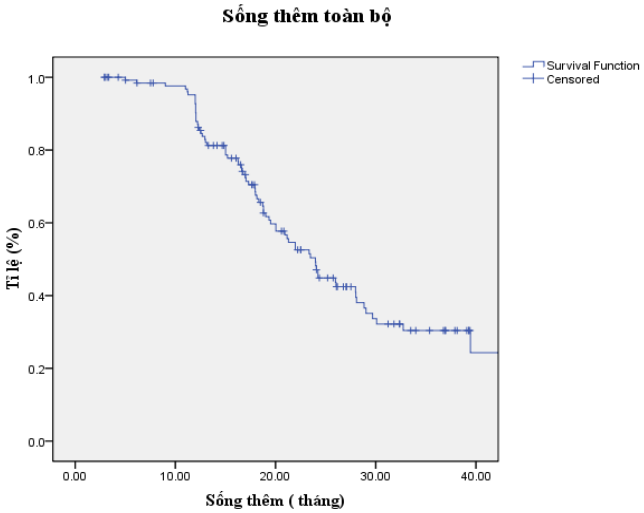

Chart 1: Patients's survival time

Table 3: The rates of survival time of patients

Time	Rates (%)
12 months	92,7 %
24 months	48,2 %
36 months	30 %

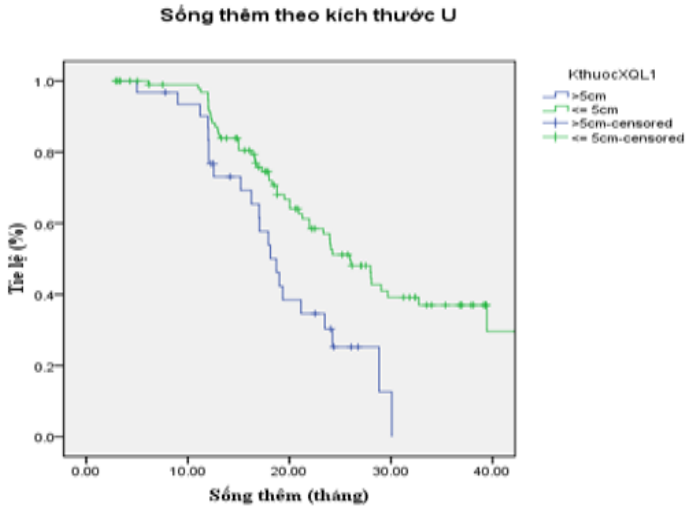

Chart 2: Patients's survival time dependent on the size of tumor

Table 4: The rates of survival time of patients dependent on the size of tumor

Tumor	12 months	24 months	36 months	
>5cm (31 patients)	83,4%	30,3%	9%	**P = 0,003**
<=5cm (101 patients)	94,6%	54,1%	37%	

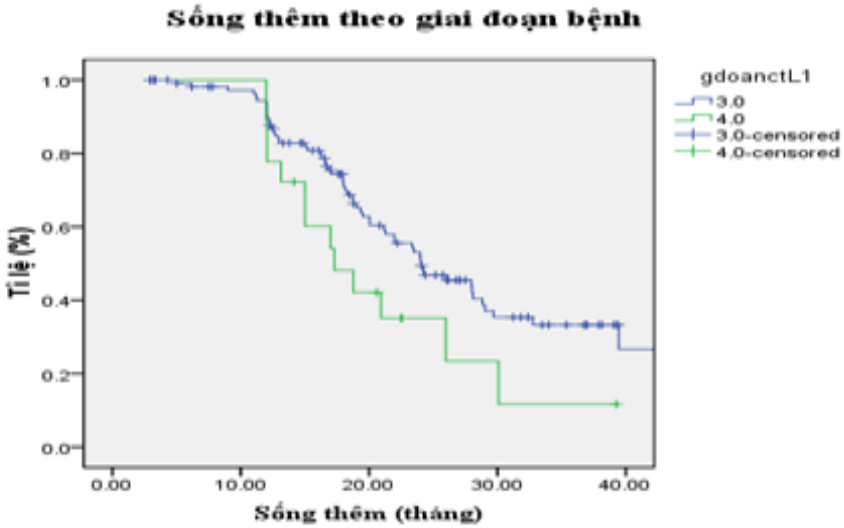

Chart 3: Patients's survival time dependent on disease stages

Table 5: The rates of survival time of patients dependent on disease stages

Stage	12 months	24 months	36 months	
Stage 3 (114 patients)	93,4 %	50,6%	33,3 %	**P = 0,05**
Stage 4 (18 patients)	88,9 %	35,1 %	11,7%	

Chart 4: Patients's survival time dependent on chemistry therapy dose

Table 6: The rates of survival time of patients dependent on chemistry therapy dose

Chemistry therapy	12 months	24 months	36 months	
< 80% (34 patients)	97 %	30,7 %	6,9 %	**P = 0,003**
>= 80% (98 patients)	91,2 %	55,1 %	39,2 %	

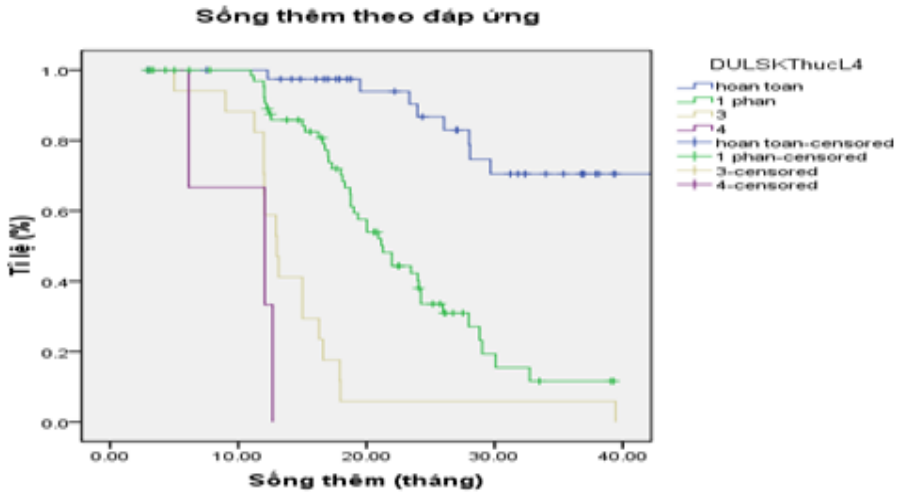

Chart 5: Patients's survival time dependent on completely treatment

Table 7: The rates of survival time of patients dependent on completely treatment

Response	12 months	24 months	36 months	
Excellent (41 patients)	97,4 %	86,7 %	70,5 %	P<0,001
Indeterminate (71 patients)	95,3 %	40,1 %	11,6 %	
Incomplete (17 patients)	70 %			
Evolutional (3 patients)	33,3 %			

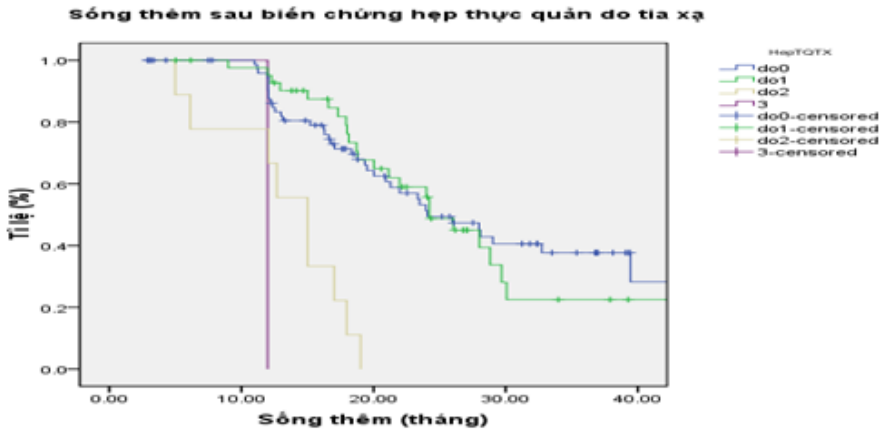

Chart 6: Patients's survival time dependent on esophageal stricture after radiation therapy

Table 8: The rates of survival time of patients dependent on esophageal stricture after radiation therapy

Esophageal stricture	12 months	24 months	36 months	
Stage 0 (79 patients)	94,4 %	49,4 %	37,7 %	P<0,001
Stage 1 (43 patients)	92, 7 %	55,7 %	22,5 %	
Stage 2 (9 patients)	66,7 %			
Stage 3 (1 patient)				

IV. DISCUSSION

1.Clinical characters

The age of the patients in our study ranged from 38 to 80 years. The most common age ranges from 40 to 59 years, accounting for 75%. Our results are also consistent with other authors such as Bui Van Lenh (74.5%), Pham Duc Huan (69%), and Han Thanh Binh (60,5%).

Esophageal cancer is most common in men, accounting for 98.5%, male/female ratio is 65/1. According to research by Han Thanh Binh was 96.5% and ratio was 29/1, Bui Van Lenh was 96.8%, and Pham Duc Huan was 96.9%.

According to our study, squamous cell carcinoma accounts for 100%. According to research by Han Thanh Binh, squamous cell carcinoma accounted for 92.6%, and adenocarcinoma accounted for 7.4%, and by Pham Duc Huan, squamous cell carcinoma was 63.1%, and adenocarcinoma was 32.1%. According to foreign studies, squamous cell carcinoma accounted for 90% and adenocarcinoma accounted for 10%.

2.The duration of survival

- The survival time of patients:

The 12-, 24-, and 36 months overall survival rates are 92,7%, 48,2%, and 30%, respectively. According to research by Han Thanh Binh, the 6-, 12-, and 24 months overall survival ratesrespectively were 45,16%, 20,93%, and 9,33%, and the duration of survival was 8±0,8 months; by Kaoru Ishida, the survival rates after 2 years was 31,5%, and the average duration was 10 months; by Nicolas Magné, the survival time 5 years was 11%, and the expectancy more 9,6 months; by Jean Frangcois, the 1-, 2-, and 5 years overall survival rates were 52,9%, 29,8% and 12,1%, respectively, and the survival time was 16±1,6 months.

- The survival time of patients is depends on the size of tumor:

In our study, the survival rates in 12-, 24- and 36 months of the tumor of size is greater than 5 cm, are 83,4%, 30,3% and 9%, respectively. Meanwhile, these rates of the size is smaller than 5 cm are 94,6%, 54,1% and 37%. The duration of survival of the tumor's size is greater than 5 cm is 19,5 months; and the size is smaller than 5 cm is 29,7 months. The survival time is related to the size of the tumor. The tumor of size is larger, the less time to live. This difference is statistically significant with p = 0,003.

- The survival time of patients depends on cancer stages:

The 12-, 24- and 36 months survival rates with stage III are respectively 93,4%, 50,6% and 33,3%; and with stage IV are 88,9%, 35,1% and 11,7% respectively.This difference is statistically significant with p = 0,05.

- The survival time of patients depends on chemistry therapy dose:

The 12-, 24- and 36 months survival rates with patients treated by chemistry therapy dose less 80% are respectively 97%, 30,7% and 6,9%; and with the dose more 80% are 91,2%, 55,1% and 39,2%. From the above results shows us, patients were treated by chemical dose more 80% will be live more time than the dose less 80%. But after 12 months survival time, it is same both of dose in our study. This demonstrates that patients are better physically and able to recover better after treatment the high chemical dose. This difference is statistically significant with p=0,003.

- The survival time of patients dependent on completely treatment:

The 12-, 24- and 36 months survival rates with patients had excellent treatment are respectively 97,4%, 86,7% and 70,5%; and indeterminate treatment are 95,3%, 40,1% and 11,6%. While the 12 months survival rates with patients had incomplete treatment is 70,6%; and evolutional treatment is 33,3%. This result shows us that the more patients respond to treatment, the longer the patient's life expectancy.This difference is statistically significant with p< 0,001.

- The survival time of patients dependent on esophageal stricture after radiation therapy:

Esophageal stricture has 4 stage (stage 0-stage 3). In our stydy, the 12-, 24- and 36 months survival rates with patients had esophageal stricture stage 0 after radiation therapy are respectively 94,4%, 49,4% and 37,7%; and rates with stage 1 are 92,7%, 55,7% and 22,5%. The 12 months survival rates with esophageal stricture stage 2 is 66,7%. There is 1 patient had esophageal stricture stage 3, and he died after few months. In short, the extra life depends on the stage of esophageal stricture after radiation therapy.At that time, the ability of the patient to eat difficult with the initial injury to the esophagus (when the tumor invades the esophagus), accompanied by poor response to treatment, so the case is worse,as the duration of survival is less. This difference is statistically significant with p < 0,001.

V. CONCLUSION

Through the study of 132 patients with stage III and IV esophageal cancer treated at National Cancer Hospital, we draw some conclusions.

- Patient characteristics: The age seen in high frequency from 40 to 59 withmale / female ratio is 65/1. Squamous cell carcinoma accounts 100% of esophageal cancer.

- Results of Chemistry Radiation Therapy: the duration of survival depends on the size of the tumor, the stage of the cancer, the dose of the chemistry therapy and the stage of esophageal stricture after radiation therapy. The tumor of size is larger, the less time to live.Patients are better physically and able to recover better after treatment with a high chemical dose. And esophageal stricture is milder, the cure is easier.

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RÉSUMÉ:

DURÉE DE LA SURVIE DANS LE TRAITEMENT DU CANCER DE L'OESOPHAGE AU STADE III, IV, PAR CHIMIOTHÉRAPIE ET RADIATION À L'HÔPITAL NATIONAL DU CANCER

Nguyen Duc Loi* et al
**Hôpital National du Cancer*

Sur 132 patients avec cancer oeophagien traités par chimiothérapie concomittante avec radiothérapie entre 2009 et 2013, nous tirons quelques conclusions suivantes:

1. Caractéristiques du patient:

- Âges: Surtout de 40 à 59 ans, hommes/femmes: 65/1.
- Cellules cancéreuses: Cellules squameuses: 100%

2. Résultats:

- 12 mois, 24 mois, 36 mois de traitement: Survies correspondantes: 92.7%, 48.2%, et 30%.
- La grosseur des tumeurs ayant été soumises au traitement variait de: supérieure à 5cm: 83.4%, 30.3%, et 9%, la tumeur inférieure à 5cm sont 94.6%, 54.1%, 37%, correspondant aux durées de traitement citées.
- La durée du traitement pendant 12 mois, 24 mois, et 36 mois, et la durée de survie correspondante du cancer de l'oesophage au stade III étant respectivement 93.4%, 50.6%, et 33.3%, et au stade IV étant 88.9%, 35.1%, et 11.7%, respectivement (P=0.05).
- Chimiotherapie additionnelle: 24 mois, 36 mois.
+ Patient soumis à <80% de la dose thérapeutique: 30.7%, 6.9%.
+ Patients soumis à ≥ 80%: 55.1%, 39.2%. P=0.003.
- Patients au traitement complet: 24 mois, 36 mois.
+ Groupe excellent: 86.7%, 70.5%.
+ Groupe indéterminé: 40.1%, 11.6% avec P<0.001.
- Patients avec sténose oesophagienne après radiothérapie: 24 mois, 36 mois.
+ Stade 0 de sténose: 49.4%, 37.7%.
+ Stade 1 de sténose: 55.5%, 22.5%, avec P<0.001.

Conclusion: La durée de la survie dépend du calibre de la tumeur, le stade du cancer, la dose de la chimiothérapie, et le degré de sténose après radiothérapie. Plus la tumeur est grosse, moins les chances de survie. Le patient au meilleur physique résiste mieux au traitement à grande dose chimique, et moins grande est la sténose, plus facilitée est la cure.

SOME DENTAL MORPHOLOGICAL CHARACTERISTICS OF THE RAGLAI ETHNIC GROUP IN KHANH HOA PROVINCE

Nguyen The Dung*, Nguyen Thi My Linh*

ABSTRACT

Objective: To determine the rates of incidence of shovel-shape in maxillary central and lateral incisors, cusp of Carabelli of maxillary 1st molar and groove anatomy of mandibular 1st molar.

Method: The dental morphological characteristics were observed on 215 pairs of studying casts of the Raglai ethnic group.

Results: Majority did not have shovel-shaped maxillary incisors. There was no significant difference in morphological shape of maxillary central incisors on contralateral quadrants or between the male and female. There was also no significant difference in morphological shape of maxillary lateral incisors on contralateral quadrants. However, there were significant differences between the sexes ($p<0.05$). The prevalence of shovel shaped morphology in maxillary central incisors is significantly higher than that in maxillary lateral incisors ($p<0.001$). The majority of participants had cusp of Carabelli and groove anatomy in 1st molars. However, there was no significant difference between the two contralateral sides of the jaw or between the sexes. Moreover, the Y pattern groove weighted majorly but there was no significant difference between male and female.

Conclusion: Dental morphologies of Raglai ethnic group are uniquely similar to those of Ede ethnic group.

I. INTRODUCTION

Tooth morphologies are source of study not only for dentists but also for anthropologists because teeth contain valuable traits helpful for researchers in anthropology, genetics and evolution.

Historically, many studies about tooth anthropology have been carried out for a long time: De Terra (1905), Hrdlicka (1911, 1920), Flower (1985) and etc. In Vietnam, the authors have researched on morphological characteristics of Vietnamese teeth such as Ede, Coho (Hoang Tu Hung), Katu (Phan Anh Chi). Among tooth morphologies, shoved-shaped of maxillary incisors, cusp of Carabelli and groove patterns are the characteristics that help anthropology researchers to distinguish different ethnic groups. In this study, we collected the samples and classified data based on the morphology traits of the Raglai ethnic group. Raglai is one of the relatively large ethnic groups yet there are no studies on dental morphologies in this ethnic group.

Objectives

1. To determine the prevalence of shovel-shaped morphology of maxillary central and lateral incisors.
2. To determine the prevalence of cusp of Carabelli in maxillary 1st molar.
3. To determine the prevalence of central groove patterns in mandibular 1st molar.
4. To conclude about the anthropological characteristics of Raglai people in Khanh Hoa comparing to other ethnic groups in Vietnam.

II. MATERIALS AND METHODS

2.1 Materials

Target population: Raglai people living in Khanh Hoa province.

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Date of scientific judgment: 9/10/2018
Reviewed date: 8/11/2018

Sample population: Raglai whose parents are native Raglai are between 18 and 25 and reside in district 2, Khanh Son and Khanh Vinh, Khanh Hoa province.

$$n = Z^2_{1-\alpha/2} \times \frac{p(1-p)}{d^2} = 143$$

$Z_{1-\alpha/2}$ = 1,96 , with type I error (α = 0,05) significan level 95%.

p = 39,5% (average rate of shovel shaped maxillary incisors from the study that Dr. Hoàng Tử Hùng in Ede ethnic group in 1981).

d: margin of error 0,08 (8%).

Because we chose to use the proportional probability model (PPS), we estimated the design effect to be 1.5, so the sample size was 143 × 1.5 = 215 (people).

2.2 Methods

Cross-sectional descriptive study, analyzed whole dentitions.

2.2.1. Shovel-shaped maxillary incisors: observed visually by eyes and 4X magnification loupes the lingual surfaces of maxillary central and lateral incisors, evaluating and classifying based on Hrdlicka study in 1920[3]:

- No shovel-shaped morphology: there is no trait of fossa: degree 0.
- Light shovel-shaped morphology: there is a light trait of fossa but not deep enough to consider to be classified as half shovel: degree 1.
- Mediocre shovel-shaped morphology: prominence marginal ridge but shallow fossa: level 2.
- Shovel-shaped morphology: prominence marginal ridge and prominence fossa : level 3.

2.2.2. Cusp of Carabelli: evaluation and classification according to Dahlberg's study in 1963[8]:

Level 0: no ridges, pits or any features of cusp of Carabelli.

Level1: a slight ridge and groove.

Level 2: a small pit with minor grooves diverging from depression.

Level 3: double vertical ridges or slight and incomplete cusp outline.

Level 4: Y form: moderate grooves curving in opposite directions.

Level 5: small tubercle.

Level 6: broad cusp outlines moderate tubercle.

Level 7: large tubercle with free apex.

The subjects of the cusp of Carabelli study were divided into three groups: no Carabelli expression (grade 0); Carabelli pits and grooves (Grade 1,2,3,4) and Carabelli tubercle (grade 5,6,7).

2.2.3 Central groove patterns of mandibular 1st molar: evaluation and classification according to Jorgensen study in 1955 [4]:

- Y pattern: mesiolingual cusp and distobuccal cusp meet at central fossa.
- + pattern: mesiobuccal cusp and distolingual cusp meet at central fossa.
- X pattern: mesiobuccal cusp, mesiolingual cusp, distobuccal cusp and distolingual cusp meet at central fossa.

III. RESULTS AND DISCUSSION

3.1. Shovel-shaped morphology of maxillary incisors

According to table 1 and 2, the majority of this ethnic people had shovel-shaped morphology in both maxillary central and lateral incisors. There was no significant difference in shovel-shaped morphology between maxillary central versus maxillary lateral incisors. The results were similar to

those in the studies carrying out by Hrdlicka[3], Ling[5] và Phan Anh Chi[1].

Table 1 : The percentages of shovel-shaped morphology of maxillary central incisors.

	0 (%)	1 (%)	2 (%)	3 (%)	Z	p
Right	0,9	40,9	25,6	32,6	1,751	**0,08**
Left	0,5	43,3	29,3	27		
Both	0,7	42,1	27,4	29,8		

Table 2: The percentages of shovel-shaped morphology of maxillary lateral incisors.

	0 (%)	1 (%)	2 (%)	3 (%)	Z	p
Right	1,4	87,0	9,3	2,3	0,258	0,796
Left	1,4	86,5	9,8	2,3		
Both	1,4	86,7	9,5	2,3		

According to table 3, there was no significant difference in shovel-shaped morphology of maxillary central incisors between female and male. However, the percentage of having no shovel-shaped, light shovel-shaped and prominence shovel-shaped of maxillary lateral incisors are all higher in male than those in female.

Table 3: Comparison of the varies in shovel-shaped morphology of maxillary central and lateral incisors between male and female.

		0 (%)	1 (%)	2 (%)	3 (%)	$\chi 2$	P
Maxillary central incisors	Male	0	47,8	22,8	29,3	7,271	0,0637
	Female	1,2	37,8	30,9	30,1		
Maxillary lateral insicors	Male	2,2	89,1	5,4	3,3	8,489	0,0369
	Female	0,8	85,0	12,6	1,6		

As comparing between central incisors and lateral incisors, shovel-shaped morphology was manifested more greatly in lateral incisors than that in central incisors. The result was similar to that in the study carrying out by Phan Anh Chi[1].

Table 4: Comparison the shovel-shaped morphology of central incisors versus lateral incisors

		0 (%)	1 (%)	2 (%)	3 (%)	Z	P
Right	Central incisor	0,9	40,9	25,6	32,6	9,461	< 0,001
	Lateral incisor	1,4	87,0	9,3	2,3		
Left	Central incisor	0,5	43,3	29,3	27	9,212	< 0,001
	Lateral incisor	1,4	86,5	9,8	2,3		

According to table 6, there was a statistically significant difference in the shovel-shaped morphology levels of central incisors between the Raglai, Kinh, Ede, Coho and Katu ethnic groups.

Table 6: Comparison of shovel-shaped morphology levels between the Raglai and others ethnic groups in the country

Comparison pairs	0+1 (%)	2 (%)	3 (%)	χ^2	P
Raglai	42,8	27,4	29,8	19,345	0,0001
Kinh	17,86	24,4	57,74		
Raglai	42,8	27,4	29,8	9,247	0,0098
Êđê	60,45	26,12	13,43		
Raglai	42,8	27,4	29,8	18,716	0,0001
Cơho	72,67	15,33	12		
Raglai	42,8	27,4	29,8	43,938	< 0,0001
Katu	8,5	17,5	74		

3.2. Cusp of Carabelli characteristics

The results show that cusp of Carabelli features were most prominent in pits and grooves (Tables 7 and 8). There was no difference in the level of expression between contralateral quadrant of same arch (Table 7) and between males and females (Table 8). The results were similar to the studies carrying out by Scott [6], King [5], Phan Anh Chi [1]

Table 7: The varies of cusp of Carabelli expression levels of maxillary 1st molar

	0(%)	1(%)	2(%)	3(%)	4(%)	5(%)	6(%)	7(%)	Z	P
Right	20,0	6,0	19,5	9,8	19,1	20,5	3,3	1,9	0,108	0,914
Left	18,6	4,7	20,5	15,8	16,3	19,5	3,3	1,4		
Both	19,3	5,3	20,0	12,8	17,7	20,0	3,3	1,6		

Table 8: Comparison of cusp of Carebelli expression levels between male and female

	0(%)	1(%)	2(%)	3(%)	4(%)	5(%)	6(%)	7(%)	$\chi 2$	P
Nam	16,3	4,3	20,7	13,0	19,0	21,2	3,8	1,6	3,04	0,881
Nữ	21,5	6,1	19,5	12,6	16,7	19,1	2,8	1,6		

Table 9: Comparison cusp of Carabelli expression level between Raglai to others ethnic groups

Group	No cusp of Carabelli	Cusp of Carabelli with grooves and pits	Cusp of Carabelli with tubercle	$\chi 2$	P
Raglai	19,3	55,8	24,9	19,4	0,0001
Việt	40,74	53,34	5,92		
Raglai	19,3	55,8	24,9	4,54	0,1033
Êđê	31,58	51,13	17,29		
Raglai	19,3	55,8	24,9	14,652	0,0007
Cơ ho	35,09	57,89	7,01		
Raglai	19,3	55,8	24,9	12,842	0,0016
Katu	35,5	56	8,5		

According to table 9, the prevalence of having cusp of Carabelli characteristics in Raglai ethnic group is very different to that in others ethnic groups such as Kinh, Katu, Cohor. However, there was no difference between Raglai ethnic group and the Ede ethnic group.

3.3. Central groove patterns of mandibular 1st molar

In Raglai's dentitions, the Y pattern central groove predominated (table 10). Compared to others ethnic groups, the central groove morphology of mandibular 1st molar in Raglai ethnic

varied from that of Ede and Cohor ethnic groups, yet there was no statistically significant difference to that in Kinh ethnic (table 11).

Table 10: Central groove patterns of mandibular 1st molar

		+ pattern	X pattern	Y pattern	$\chi 2$	P
Right	Male	10,9	7,6	81,5	4,584	0,472
	Female	12,2	9,8	78,0		
Left	Male	5,4	6,5	88,0	1,883	0,910
	Female	8,9	8,1	82,9		
Both	Male	8,2	7,1	84,8	1,34	0,513
	Female	10,6	8,9	80,5		
	Total	9,5	8,1	82,3		

Table 11: Comparison the central groove patterns of mandibular 1st molar in Raglai ethnic to others ethnics

Comparison pairs	+ pattern	X pattern	Y pattern	χ^2	P
Raglai	9,5	8,1	82,3	4,655	0,0975
Kinh	12,5	0,88	88,62		
Raglai	9,5	8,1	82,3	7,155	0,0279
Êđê	15,27	0	84,73		
Raglai	9,5	8,1	82,3	6,425	0,0402
Cohor	11,11	0	88,89		

IV. CONCLUSION

4.1. Shovel-shaped morphology of maxillary central and lateral incisors

- Central incisors: the prevalence of no shovel-shaped morphology (level 0 &1) was 42.8%, mediocre shovel-shaped morphology (level 2) was 27.4% and that of prominence shovel-shaped morphology was 29.8%. There was no significant difference between male and female.

Lateral incisors: the prevalence of no shovel-shaped morphology (level 0&1) was 88.1%, mediocre shovel-shaped morphology (level 2) was 9.5% and that of prominence shovel-shaped morphology was 2.3%. There was no significantly difference between contralateral quadrants but greatly varied between male and female ($p<0.05$).

- Shovel-shaped morphology of maxillary central incisors was significantly more noticeable than that of maxillary lateral incisors ($p<0.001$).

2. Cusp of Carabelli of maxillary 1st molar

- The prevalence of no cusp of Carabelli was 19.3%, Cusp of Carabelli with pit and groove was 55.8% and that of cusp of Carabelli with tubercle was 24.9%.

- There was no significant difference between female and male.

3. Central groove patterns of mandibular 1st molar

- The prevalence of Y pattern was 82.3%, X pattern was 8.1% and + pattern was 9.5%.

- There was no significant difference in central groove morphology between female and male.

- The Raglai ethnic group seemed to be similar in dental anthropology to Ede ethnic group.

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RÉSUMÉ:

QUELQUES CARACTÉRISTIQUES DANS LA MORPHOLOGIE DENTAIRE CHEZ LE GROUPE ETHNIQUE RAGLAI DE LA PROVINCE DE KHANH HOA

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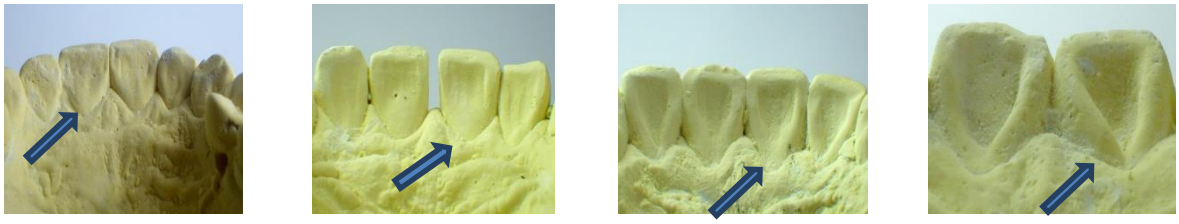
Objectif: Déterminer l'incidence des incisives en forme de pelle du maxillaire central et latéral, la protubérance de Carabelli de la premiere molaire, et l'anatomie du sillon de la première molaire de la mâchoire inférieure.

Méthode: Les caractéristiques dentaires ont été décrites chez 215 paires de moulages appartenant au groupe ethnique Raglai.

Resultats: La plupart n'ont pas de d'incisives du maxillaire en forme de pelle. Il n'y a pas de différence notable dans la morphologie des incisives maxillaires centrales, ou dans les quadrants controlatéraux, ou chez les deux sexes. Aussi, il n'y a pas de différence notable dans la morphologie des incisives maxillaires centrales dans les quadrants controlatéraux. Pourtant, des différences entre les deux sexes ont été observées ($p<0.05$). Il y a plus d'incisives maxillaires en forme de pelle pour les incisives maxillaires centrales que pour celles de la partie latérale. ($p<0.001$). La plupart des sujets avaient la protubérance de Carabelli et l'anatomie du sillon aux deux premières molaires. Pourtant, il n'y a pas de différence notable entre les parties controlaterales de la mâchoire ou entre les deux sexes. En plus, le modèle sillon en Y se retrouve dans la majorité mais la difference entre les deux sexes est insignifiante.

Conclusion: Les morphologies dentaires du groupe ethnique Raglai sont remarquablement similaires à celles du groupe ethnique Ede.

SOME PICTURES OF SOME DENTAL MORPHOLOGICAL CHARACTERISTICS
OF THE RAGLAI ETHNIC GROUP IN KHANH HOA PROVINCE



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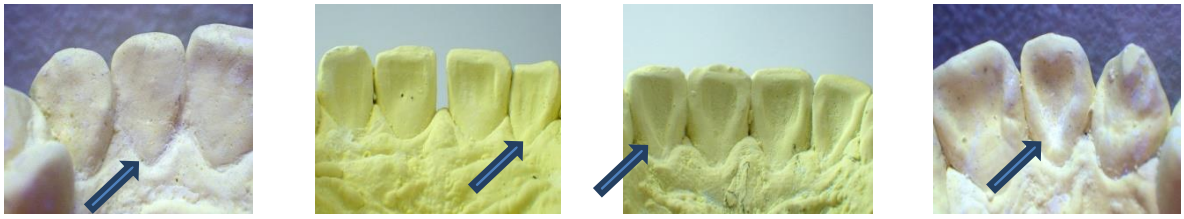
Picture 1: Four expression levels of shovel-shaped morphology of maxillary central incisors



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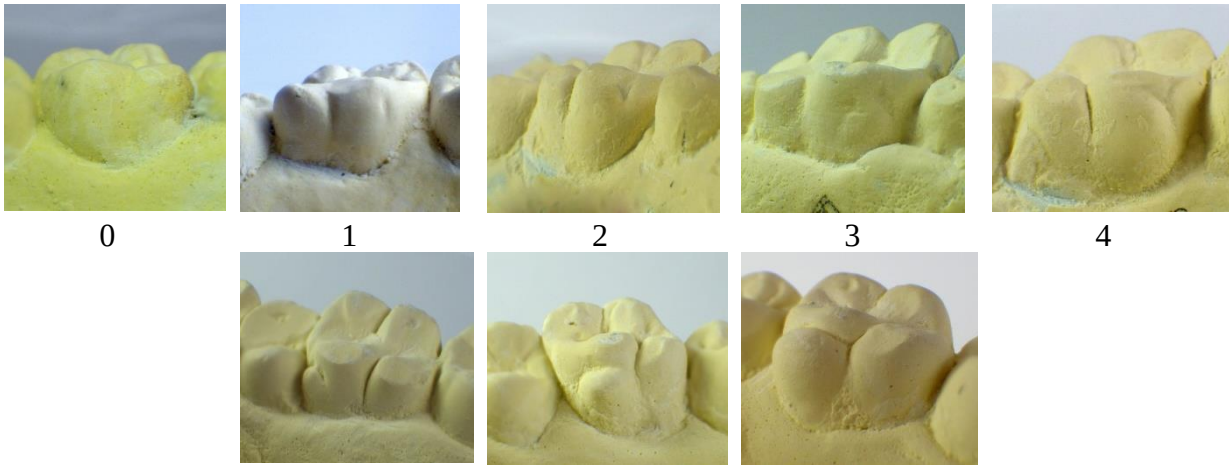
Picture 2: Four expression level of shovel-shaped morphology of maxillary lateral incisors



0 1 2 3 4

5 6 7

Picture 3: Different expressions of cusp of Carabelli

*"**Y**" form* *"**X**" form* *"+"form*

Picture 4. Central groove pattern in mandibular 1st molar

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