EVALUATION ON RESULT OF SURGICAL TREATMENT FOR SCALP DEFECT AFTER CANCER RESECTION AT THE MAXILLOFACIAL AND PLASTIC SURGERY DEPARTMENT IN 108 CENTRAL MILITARY HOSPITAL

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ABSTRACT

Objectives: To describe the clinical features and classify the scalp defect after cancer resection; Evaluate the surgical effectiveness of scalp defect treatment by local tissue. **Object-Method**: 25 patients with scalp defects after cancer resection are treated with plastic surgery with local tissue; Non-controlled clinical intervention, progressive research. **Results-Discussion:** The average age of the patient was 66.33; The main cause is squamous and basal cell epithelial cancer; skin defects are mainly large types> 20cm^2 (52%), extensive surgery of scalp flap shaping surgery combined with skin grafting accounts for 52%. The near result was good at 68%; the far results are good with 80%. **Conclusion:** In elderly patients with many combined diseases when there is a medium (5-20 cm^2) and large (> 20 cm^2) scalp defect, the use of local skin flap in combination with skin graft is the best treatment option.

Key words: *scalp defect, scalp cancer, superficial temporal pedicle flap, occipital pedicle flap.*

I.QUESTION:

The scalp has a different anatomic structure from the skin of other parts on the body (thick, poorly stretched, with hair) and the scalp has a special function that covers the skull, therefore upon the scalp suffers serious defects, the skull plastic surgery is required. Serious scalp defect can be found in many types of diseases (burns, inflammation, post-tumor resection ...). The rate of scalp defect after cancer resection (K) in elderly patients, with many combined diseases, although it does not account for a great percentage, it is always difficult for the surgeon to consider choosing surgical solutions. The nature of scalp defects after cancer resection is often large in size, may have infiltrated the skull plate, exposed bones, exposed meninges, elderly patients with many combined diseases should choose an effective and safe shaping method with a short surgical time.

There have been many methods as well as shaping materials to cover large scalp defects with their own advantages and disadvantages. Thick skin grafting or extracting is almost impossible to use in this form of defect, stretching is a method with many advantages, but it requires many surgeries and is expensive. Free flap with micro-surgery technique is a very effective method with a large amount of material, it, however, requires modern equipment as well as microsurgery, prolonged surgery, high withstanding patient condition against major surgery, high risk of embolism in elderly patients, diabetic diseases, high blood pressure, atherosclerosis...

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Scalp flap in place with outstanding advantages in skin quality, simple, safe, practicable technique, quick surgery and recovery time, radiotherapy may be taken right after surgery,... is the most reasonable solution for the cases of large scalp defect and skin stretching or microsurgery flap methods are impossible to apply. In Maxillofacial and Plastic Surgery Department in 108 Central Military Hospital, there has been a certain number of elderly patients provided with large scalp defect shaping method with skin flap in place as well as pedicle flap with good results, however, it is necessary to take an objective, scientific evaluation of the effectiveness of this method. Thus, we set up the topic: "Evaluation on result of surgical treatment for scalp defect after cancer resection at the maxillofacial and plastic surgery department in 108 central military hospital " with two objectives:

1. To describe the clinical features and classify the scalp defect after cancer resection;

2. Evaluate the surgical effectiveness of scalp defect treatment by local tissue

II. OBJECT-METHOD:

2.1. Object:

Patients with scalp defects after scalp K-resection and treated with plastic surgery with the following methods: direct incision closure, using random flap in place and pedicle flap such as the temporal or occipital flap. Patients were treated at the Maxillofacial and Plastic Surgery Department in 108 Central Military Hospital from January 2015 to August 2020.

2.2. Method

2.2.1. Design

Non-controlled clinical intervention, progressive research. The randomized sample satisfies the selection criteria and exclusion criteria from patients examined and treated at the Maxillofacial and Plastic Surgery Department in 108 Central Military Hospital from January 2015 to August 2020 is used in research.

2.2.3. Techniques

Patients are examined, classified, evaluated defects, planned for treatment, suitable surgical methods selected to cover scalp defects after resection of the pathological area is taken. Skin defects are expected to be evaluated when cutting defects 1.5-2cm away from tumor margins. The final size of the defect will be determined when the cut edge biopsy has no cancer cells on application of immediate biopsy.

- **Classification of defects:**

In the research, we use the method of sorting the degree of defects according to the method of the author Cherubino M. (2013) [2], the scalp defect area is divided in three groups:

- Minor defect: area <5 cm^2.

- Average defect: area from 5 cm^2 to 20 cm^2.

- Major defect: area> 20 cm^2.

- **Scalp defect covering methods are used:**

(1) Close the incision directly.

(2) Use random flap: swivel flap; permutation flap; push flap

(3) Pedicle flap: superficial temporal artery or occipital artery

When using flap, at the position of collected flap, if the skin needs grafting, we use the skin extraction taken from the thigh area or right at the scalp area.

2.2.4. Result evaluation

- Evaluation of close results: when a patient is discharged from the hospital.

+ Very good: Covered flap is completely defected. The incisions are healing at the first period. In the case of skin extraction used for grafting, the grafted skin is well healed, the epithelial skin area in 7-14 days.

+ Good: The flap may be in malnutrition condition of healing flap edge or additional cutting and suturing is required but all defects are still covered up. In the case of skin extraction for grafting, the grafted skin is good, the epithelial skin area in 7-14 days.

+ Average: When there is one of the following conditions: malnutrition, necrosis <30% area or less necrosis but in important positions (exposed meninges, exposed shaping titanium...), it is necessary to have additional plastic surgery; skin extraction area is healing slowly; skin extraction grafting area with partial necrosis requires additional graft.

+ Poor: When there is one of these conditions: necrotic flap over 30%, exposed, reshaped titanium mesh; skin extraction area with depth variation takes a long time treatment; Necrotic skin grafting area must be completely re-grafted.

- Evaluation of distant result: 3 months after surgery

+ Very good: The flap is soft, completely covers the defect. Skin extraction area and skin grafting area (if any) with nice scar

+ Good: When there is one of these conditions: the flap can be hardened, rough scar but still covers the defect; Skin extraction area and skin grafting area with rough, bad scar.

+ Average: When there is one of the following conditions: atrophic flap, sclerosis, inflammation in the wound leak but not exposing skull bone; skin extraction area and skin grafting area with thick, hard and painful scar.

+ Poor: When there is one of the following conditions: curled flap, exposed skull bone; skin extraction area and skin grafting area experienced ulcer, not healed.

III. RESEARCH RESULT

3.1. Age - gender:

25 patients who met the requirements of the selected research objects with an average age of 66.33 (+/- 17.85) with the rate of male 15/25 (60%), female 10/25 (40%).

3.2. Causes - the time from disease until surgery

Time/cause	<1 year	1- 5 year	> 5 year	Total
K Squamous cells	8	3		11/25 (44%)
K basal cells	5	5		10/25 (40%)
Sarcom	2			02/25 (8%)
K meninges		1		01/25 (4%)
Sebaceous K	1			01/25 (4%)
Total	16/25 (64%)	09/25 (36%)	0	

Comments: The main cause of scalp defect is K Squamous cells and K basal cells with the disease progression period less than 1 year is 16/24 (66.7%).

3.3. Main clinical symptoms

Symptom	Tumor	Ulcer	Pain	Abccess
K Squamous cells	6	5		
K basal cells	5	5		
Sarcom			2	
K meninges			1	
Sebaceous K				1
Total	**11/25**	**10/25**	**3/25**	**1/25**

Comment: There are few cases of pain and abccess, so patients often come to the clinic late.

3.4. Location - size of defect after defect surgery

Location / Size	< 5 cm^2	5-20 cm^2	>20 cm^2
Forehead	2	1	1
Vertex		2	3
Vertex - occipital			5
Occipital	1	1	1
Vertex	4	1	2
Temporal - Vertex			1
Total	**7/25 (28%)**	**5/25 (20%)**	**13/25 (52%)**

Comment: The large defect accounts for a high proportion and may be related to 2-3 anatomical zone.

3.5. Defective components

Type K / defect component	Skin	Osteocyte	Bone	Meninges
K Squamous cells	11	3	3	
K basal cells	10	1	1	
Sarcom	2	2		
K meninges	1	1	1	1
Sebaceous K	1			
Total	**25/25**	**7/25**	**5/25**	**1**

Comment: The skin defect is mainly but often infects the osteocyte.

3.6. Surgical type

Surgical type / K type	K Squamous cells	K basal cells	Sarcom	K meninges	K Sebaceous glands	Total
Direct closure	1	3	1			5
Flap in place	2	4				6
Flap in place + Skin graft	7	3	1		1	12
Flap in place + Titanium mesh + Skin graft		1		1		2
Free flap						0

Reviews: Flap in place and skin graft accounts for the highest rate and used for all types of cancer in the patient group.

3.7. Surgical results

Result	Close	Distant
Very good	17/25 (68%)	20/25(80%)
Good	08/25 (32%)	05/25 (20%)
Poor	0/25 (0%)	0/25 (0%)

Reviews: Good results increase over time thanks to the stability of the flap and the area for the skin graft.

IV. DISCUSSION

4.1. About age, gender, causes and characteristics of defects:

25 year selected patients with a mean age of 66.33 (+/- 17.85). In some previous researches, it has been shown that the rate of K scalp is more common in men than in women and in this research, the incidence between men and women has similar results (Men: 15/25 - 60%; Women: 10/25 - 40%).

In this group of objects, the main cause of scalp defect is the two main cell Ks (basal cells and squamous cells) in non-melanoma skin cancers (21/25 - 84%). This result is consistent with results reported in previous researches [9].

4.2. About the main clinical symptom that makes patients take treatment:

The main clinical symptom makes the patient to be hospitalized is that ulcerative tumors (21/25 (84%)) caused by K squamous cells /Basal scalp. Pain symptoms appear only in patients with sarcomas and K meninges (3/25 - 12%) and due to abcess caused by K sebaceous glands in only one patient (01/25 - 4%).

4.3. In terms of location and size of lesions - defects:

Archontaki M. and et al reported the common location of the scalp large K basal cell groups in the posterior occipital zone in 51 objects [1]. In the group of 25 objects of the research, the large defect area (> 20 cm^2) accounted for the majority (13/25 - 52%) with the largest size of 380cm^2. Location of defects are mainly concentrated in the apical and occipital zones (13/25 - 52%) and the ratio between men and women does not differ much (Male: 7/25 - 28%; Female: 6/25 - 24%).

4.4. About the defect components:

In the research group there are 07/25 patients (28%) with extensive defects and deep infiltrates (osteocyte, bones, meninges) in which three patients were diagnosed with histopathology with K squamous cells and one diagnosis of K basal cell infiltrates to the osteocyte. The cause of infiltrates of these four patients, but not the common forms of K susceptible cells as mentioned in previous researches [4,11,13], due to late treatment or missed lesions when taking lower level treatment that is similar to the cause reported in the research of Uwe Wollina et al (2019) [10].

4.5. About surgical methods:

Indicating surgical method (PPPT) based on the scalp defect area after mass K resection:

- Minor defect (<5 cm^2): directly close the incision.

- Average defect (5 - 20 cm^2): use random spot flap or flip flap, pedicle flap if necessary and directly close the flap place.

- Large defect (> 20 cm^2): using the flap of the superficial temporal pedicle or

occipital pedicle flap combined with plastic surgery.

In this research, for small and medium defects, PPPT indications are used similarly to the previous authors. For the group of large defects, different from PPPT of some authors such as: epithelial skull drilling for skin grafting, integra or using microsurgical free flap with large defects [2,3,15], we apply forming PPPT using superficial temporal pedicle or occipital pedicle flap.

4.6. About surgical results:

In the evaluation of close results, 17/25 patients (68%) with a good result. Of which, 07/25 patients (28%) of small defects with direct incision closure and 05/25 patients (20%) of average defects using PPPT in random flap image and 05/25 patients (20%) of the group with major defect using superficial temporal pedicle or occipital pedicle flap combined with skin extraction graft.

After evaluation of distant results, the number of good results increased by three patients from the pedicle flap - skin grafts group is 20/25 (80%) and there are no negative results at both evaluating time points.

The research result shows that, appointing PPPT of direct closure and random flap with small defects (<5 cm^2) - medium (5-20 cm^2) gives good results and consistent with the results of the previous researches [2,3,15]. In addition, the above results suggest that, with large defects (> 20 cm^2), the use of PPPT combined with superficial temporal pedicle or occipital pedicle flap combined with skin extraction graft brings after surgery results with high rate of alive flap and better distant results, as well as ensuring the aesthetic requirements of the hair area and the health condition often accompanied by many underlying diseases of the elderly group.

In addition, when using PPPT combined with superficial temporal pedicle or occipital pedicle flap combined with skin extraction graft, the surgery and healing time will be shorter and less risky than other methods (free flap, skin grafting skull drilling, integra) as superficial temporal pedicle or occipital pedicle flap capable of supplying blood to wide-area flap well and anatomical stability.

V. CONCLUSION

Scalp cancer with large and medium defects in elderly patients with many combined diseases gives plastic surgeons many challenges as the patient's clinical condition often does not allow application of complex plastic surgery methods with prolonged surgery time. Adequate pre-surgery planning with optimal surgical methods is very important for the best results for patients. The results of this research shows that PPPT should directly close to small defects (<5 cm^2) and random flap with medium defects (5 - 20 cm^2) is perfectly suitable, and PPPT combined with superficial temporal pedicle or occipital pedicle flap and skin extraction graft for large defects (> 20 cm^2) of the research team is a useful, safe, good solution for the medical condition of the elderly patient group with many risk factors.

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