

АНАТОМО-МОРФОЛОШКИ КАРАКТЕРИСТИКИ НА КОЖНИТЕ РЕЗЕНКИ ЗА ПОКРИВАЊЕ НА ПОГОЛЕМИ КОЖНИ ДЕФЕКТИ НА ТЕЛОТО

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Извадок

Многубројните патолошки промени и трауми на ниво на кожа и поткожно масно ткиво доведуваат до формирање на дефекти на истото. Покривањето на дефектите може да се врши со кожни резенки и слободни кожни трансплантати. Анатоомо-морфолошките карактеристики на кожните резенки доведуваат до нивна широка употреба за покривање на разни дефекти на кожа и поткожно ткиво дури и кога дното на дефектот е оголена коска, тетива и сл.

Нашата студија опфаќа 645 пациенти во период од 5 години (2002-2007), третирани на клиника за пластична и реконструктивна хирургија. Кожниот дефект кај овие пациенти е третиран со кожни резенки. Во оваа студија се прикажани резултати од примената на овој реконструктивен метод. Застапени се пациенти од двата пола, со присатен дефект во повеќе регии. После зафатот се испитувани колоритот, депресија, односно елевација на резенаката како и функционалните одлики во подрачје на резенките и сеопштиот естетски ефект. Одередувано е и времето на болничкото лекување. Кај пациентите коишто се третирани со кожни резенки, се гледа подобар естетски и функционален ефект, а воедно е постигнато и пократко време на лекување.

Клучни зборови: Кожни дефекти, кожни резенки, слободни кожни трансплантати, реконструктивна хирургија

ANATOMICAL AND MORPHOLOGICAL CHARACTERISTICS OF CUTANEOUS FLAPS USED FOR LARGER BODY TISSUE DEFECTS

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Abstract

Cutaneous and subcutaneous fat tissue defects are caused by various pathological and trauma conditions. Their coverage can be done with cutaneous flaps or free skin grafts. Anatomical and morphological characteristics of the skin flaps are those which make them versatile and widely applicable for soft tissue defects coverage, even when bare tendon or bone is present on the wound bed bottom.

Our study comprises 645 patients with soft tissue defects, treated on the Clinic for Plastic and Reconstructive Surgery, Skopje, in a period of 5 years (2002 – 2007). Males and females with defects on different body regions are admitted to the study. All defects were treated with skin flaps. We present the results of this reconstructive method. Postoperatively, we examined flap's color, flap's depression/elevation, functional specifics of the flaps and finally, the aesthetic value of the flaps. Hospitalization time was also examined.

The conclusion is that in patients where skin flaps were used, better aesthetic and functional effects were achieved; at the same time, the hospital stay was shorter.

Key words: Skin defects, skin flaps, skin grafts, reconstructive surgery

Introduction

The coverage of the skin defects, caused by different vulnerable reasons can be done with skin (cutaneous) flaps or free skin transplants (grafts). Skin flap is raised part of the skin still nourished by vascular bundle. The region where we take the flap from is called "donor site" or secondary defect, whereas the defect which we intend to cover is called "primary defect" or "recipient site".

Skin flaps are classified according to the donor site, arrangement of blood supply or composition of the flap. Concerning donor site, skin flaps can be:

Local skin flaps are those where recipient and donor site are laid one to each other. We can achieve that by using different movements of the flap: undermining, advancement, rotation, transposition and interlaying. Having in mind the previous, the flaps can be: advancement flap, rotation flap, transposition flap, bipedicular flaps, rhomboid flap, "V-Y", "Z", "W" flaps, bilobed flap etc.

Distant flaps are those raised from a donor site located way out of the primary defect. Usually these flaps are transposition, where secondary and primary defect are brought close to each other, so that the flap is laid down. They can be crossed - bundled flaps, tubular - cylindrical flaps, "jump" flaps. Adequate arterial blood supply and venous drainage that communicate with flap's microcirculation is required for its survival.

According to the arrangement of the blood supply, flaps are divided into:

Flaps with random vascularisation where length-width ratio is 1:1, 1:2, 1:3, 1:4 and 1:5, axial flaps, arterial, venous, island flaps and finally free micro vascular flaps. The last are nourished by independent blood vessels totally divided from their base and then reattached to the recipient site vessels by using microsurgical techniques.

According to the extensiveness of the recipient site, the flap can integrate part of a muscle, a bone as well as blood supplied nerve. As regards the composition of the flap, there are skin (cutaneous) flaps, fasciocutaneous flaps, septocutaneous flaps, musculocutaneous flaps, osteofasciocutaneous flaps, osteomusculofasciocutaneous flaps, combined compound flaps.

Arteries supplying the skin usually have fasciocutaneous origin, named variously as septocutaneous, fasciocutaneous perforators, fascial perforator or free vessels. Dermal arteries nourish three types of regions:

Anatomical region that can be macroscopically dissected;

Dynamic region, which is an extension of the anatomical region and depends on the arteriolar anastomosis branching from the surrounding blood vessels;

Potential region is when the artery is in continuity isolated by the nearby artery, concerning the pressure gradient.

Defect closure by using skin flaps is convenient in all cases where insufficient circulation, bared bone, bared tendon or larger blood vessel in the wound bed is present. Flaps revitalize the tissue, enhance tissue function, form minimal scar and lead to acceptable aesthetic results.

Material and methods

This study comprises 645 patients with soft tissue defects, treated on the Clinic for Plastic and Reconstructive Surgery, Skopje, in a period of 5 years (2002 – 2007 y.). Four hundred and ten are males (63.6%), and 235 are females (36.4%).

Table 1.

Flap type	Number of patients
“Z”, “V-Y”, “W”	48
Transposition	290
Rotation	278
Bipedicular	4
Distant	14
Fasciocutaneous	9
Adiposofascia	12

Soft tissue defects occur as a consequence of burns, injuries, injury sequels, tumors and other pathologic conditions. Most frequent are head and neck defects with total cases of 486 (75.3%), trunk with 102 (15.8%) cases and extremities 57 (3.9%) patients.

The average duration of the hospital stay is 7 days. Operative techniques used are random skin flaps and compound flaps – musculofasciocutaneous and fasciocutaneous flaps. Advancement flaps applied for covering small skin defects were not counted.

Postoperative evaluation was examined twice, in two different periods – from the 7th to the 10th day and the 30th day after operation. We examined the flap color, appearance, level and sensibility.

Results

Males dominate in this study. With a total number of 486, concerning localization of the defect, head and neck region is most frequent, followed by trunk with 102 cases and extremities with 57 cases. The color of the flap is nearly identical with the surrounding skin, with no depression evidence, meaning that the flap is on the same level with the neighboring skin. The sensibility is satisfactory. The average hospitalization is 7 days long, ranging from 2 to 14 days.

Complications that accompany flap surgery are partial or total flap necrosis, haemathoma, seroma, wound opening or infection. In our series, out of 645 cases, partial flap necrosis was found in 7 cases, wound opening in 5, mild infection in 13 cases and haemathoma in 12 cases.

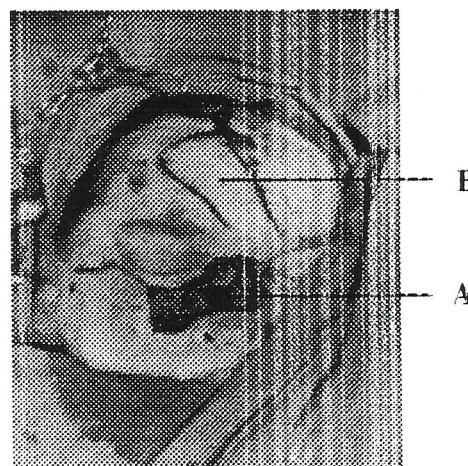


Fig. 1. Soft tissue defect of the face after radical removal of skin carcinoma (A). Flap design (B)

Discussion

Taking the above-mentioned in consideration, we can point out the fact the introduction of the skin flaps is a crucial moment in skin defects closure. Apart from local flaps, modern views for covering these defects are the micro vascular flaps, whose vascularisation depends on the donor site bundle as well as the circulation of the recipient site (4).

Every flap should be well planned in advance. Otherwise, when preoperative estimation and selected

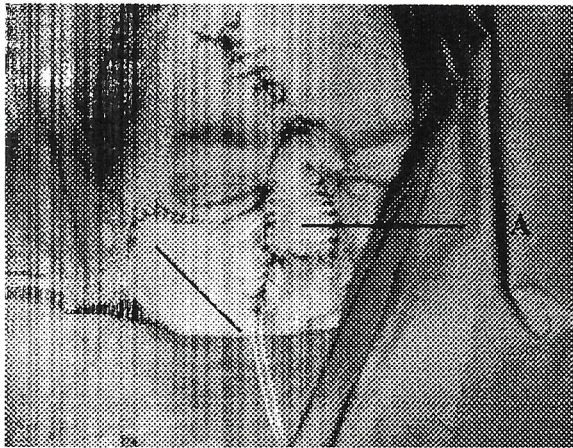


Fig. 2. Same patient after appliance of transposition (A) and rotation (B) flap



Fig. 3. Transposition flap – final result of reconstruction

surgical technique is inadequate, the result is mistreatment of the patient, and the flaps' survival is what suffers the most. Thus, basic postulates for flap application, such as right planning and maintaining the principles of reconstructive technique, should not be underestimated (3) Due to suture tension and blood supply compromitation, if present, lower viability and ischemia can occur. Also, reconstruction and planning are subject to body regions division. For each defect, pros and cons for its coverage should be considered (5).

Flaps survive because of reestablishment of the circulation between the flap and the recipient site. About 4 weeks are necessary, while the homeostasis is reached. Most frequently used flaps are local ones and they incorporate the subdermal fat tissue in their structure. But if the wound bed of the defect is bear bone or bear tendon, other flaps with muscles and fascia are added on.

Defects can be covered with skin grafts as well, but according to our clinical experience, their appliance results in worse skin color, depression of the skin level, bad functional effects and longer hospital stay (6). Skin flaps are found to be with normal color, without depression or elevation over the surrounding skin level, normal sensibility and satisfactory aesthetic and functional results. Finally, patients with skin defects where skin flaps are applied for coverage are admitted for shorter period in hospital.

Conclusion

Skin defects caused by any pathological disturbance are serious problem if not treated properly. In all cases, preoperative preparations of the patients are required, which comprises a plan for the reconstruction and flap design. Familiarity with flap surgery and knowledge of their anatomical and morphological characteristics allow us good planning of the intervention, which eventually leads to satisfactory closure of the defect resulting in good functional and aesthetic effect.

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