

Indication for the Closure of a Facial Defects by Second Intention Healing

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Summary

Closure of a defect in the head and neck area by second intention is an alternative to primary reconstruction. In order to achieve a satisfactory post-operational, aesthetic result it is important to choose the size and localisation of the dermal defect, and to educate the patient on care of the wound for the duration of treatment. As a rule the concave areas of the facial skin are the most suitable for healing by second intention. In cases of well-established indications healing by second intention is a method with excellent esthetical post-operational result. However, if the result is aesthetically unacceptable, the possibility of performing other surgical methods of reconstruction, remains.

Key words: *healing by second intention, reconstruction.*

Acta Stomat Croat
2001;

PROFESSIONAL PAPER
Received: May 29, 2001

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Introduction

The region of the head and neck represents a specific region for reconstruction, primarily for esthetical reasons. The principles of plastic reconstructive surgery (reconstruction of a defect with tissue of the same quality, non-traumatic surgical technique, leaving a scar in a "concealed place", adequate wound tending, early removal of the stitches), and the application of local sections and free skin transplants in the reconstruction, result in excellent esthetical post-operational results. Instructing the patient on post-operational care (massage of the wound, avoiding sunshine) will additionally improve the post-operational result after several months. However, in spite of the foregoing, it is impossible to avoid the visibility of a post-surgical scar.

In some localisations closure by second intention healing produces far better esthetical results. A few decades ago, Frederik Mohs, introduced a specific

technique for excision of facial carcinomas. He considered that any type of wound on the head or neck can, with satisfactory care, heal by second intention healing (1-3). In second intention healing, the whole thickness of the open wound is closed by means of contraction and epithelialisation (4). The diameter of the wound decreases by contraction. The contraction mechanism has still not been fully defined, but it is believed that microfibroblasts play a key role in this process. Microfibroblasts develop from fibroblasts, are present in the wound being contracted and contain a system of actin microfilaments, consisting of beta and gamma actin. The cells appear in the wound at about the third day after injury, and increase in number to their maximal amount between the tenth and twenty-first day. They disappear after conclusion of contraction. In cases of the whole thickness, the epithelium expands over the defect from the wound edges, by means of phagocytic cells, which "clear" the necrotic cells and plasma.

Mitoses of epithelial cells commence 48 to 72 hours after the injury. The amount of epithelial cover increases if the wound does not require debridement; if the basal lamina is intact, and if the wound is maintained in a moist state. A dry scab slows down epithelialisation (5). Several growth factors influence epithelialisation. The epidermal factor of growth (EFG) is a powerful stimulator of epithelial mitogenesis and chemotaxis. Other factors, including the fibroblast factor of growth (FFG) and keratinous growth factor (KGF), also stimulate the proliferation of epithelium.

Indications

As a rule it can be said that healing by secondary intention on concave surfaces achieves better aesthetic results and wounds on convex surfaces have poor aesthetic results, while wounds on flat facial surfaces, heals somewhere between the two aforementioned (6). Figure 1 shows facial localisation with the best esthetical result after healing by secondary intention. Figures 2a, 3a and 4a show a defect after excision of a basocellulare carcinoma. Figures 2b and 4b show the result after contraction and partial epithelialization of the defect, while Figures 2c, 3b and 4c show the post-operational result after one month. Apart from the localisation of the defect, the shape, size and depth of the wound and quality of the surrounding skin is essential for satisfactory post-operational result. Round and oval defects contract into linear scars, and when located in the relaxed facial lines, give excellent results.

Rectangular wounds acquire star-like scars and there are a few areas on the head and neck which can successfully hide them.

Small superficial wounds heal satisfactorily in all localisations. In cases of larger and deeper defects the aesthetic result is poorer. However, concave regions are an exception. Even in the case of small superficial defects the result will be unsatisfactory if the surrounding skin is quite different from the skin anticipated in the scar. The surrounding skin should not be too porous and the facial colour complexion uniform, and not too pigmented, otherwise the atrophic, relatively hypo-pigmented scar will be more visible and aesthetically less acceptable.

Prior to treatment the patients should be acquainted with the technique used, the duration of the treatment, and in what way they can speed up and improve the result. It should be emphasised that if the result is poor and the defect not completely closed, the option of surgical reconstruction still exists, which certainly can be an advantage of this technique.

Contraindications

There are a few contraindications for closure of a defect by second intention. Chemo-therapy and immuno-compromising drugs can have a greater effect on secondary intention healing than on a surgically reconstructed wound. In the case of patients who need to quickly return to their work-place, and an open wound prevents them from doing so, immediate reconstruction is indicated. In cases of more extensive resections, where bone or cartilage is exposed, immediate reconstruction should also be given priority, in order to avoid "drying" of the bone or cartilage, and consequent increased possibility of infection and tissue necrosis.

Surgical techniques

Following resection a fibrin layer develops on the surface of the defect. Once or twice a day the adherent necrotic layer should be gently removed with sterile gauze and hydrogen peroxide. The wound should then be dried, smeared with antibiotic ointment and covered with vaseline gauze. The purpose is to enable substitution of the fibrin layer with normal, healthy, granulation tissue, and to ensure clean, moist surroundings to improve epithelialisation. The first few dressings will be performed by the surgeon. The procedure should be explained to the patient and instructions given on tending the wound at home. The patient is expected to report to the surgeon in progressively longer intervals when the epithelialisation of the defect is normal.

Complications

A frequent complication can be the disruption of surrounding anatomic structures due to contrac-

tion of the scar, such as ectropion, stenosis of the outer auditive tube or oral incompetence. In such cases surgical correction of the scar is indicated. In order to avoid complications of this nature localisations for healing by second intention should be carefully selected. Other complications can be a retracted scar, hyper or hypopigmentation, the formation of teleangiectasiae and a hypertrophied scar. If the result is unacceptable after such complications, one of the techniques for scar correction is also indicated.

Conclusion

Closure of a defect by second intention healing is one of the excellent techniques available in reconstruction of the head and neck. With careful selection of the patient and localisation of the defect, this technique provides excellent aesthetic post-operative results.