

Scalp reconstruction by tissue expansion: tips and tricks

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Abstract. *Background and aim:* Numerous details regarding preoperative planning of scalp expansion are of the utmost importance for maximizing the results of this procedure. *Methods:* The purpose of this paper is to describe the tips and tricks useful for obtaining the best results in scalp expansion. *Results:* Basic concepts and operative technique are discussed and detailed. *Conclusions:* In scalp reconstruction, the use of tissue expansion allows to obtain successful results, Anyhow, it is mandatory to follow some basic rules, dictated by anatomical, technical, and psychological considerations. (www.actabiomedica.it)

Key words: Scalp defects, scalp reconstruction, tissue expansion.

Introduction

The procedure of tissue expansion has an extremely important role in the reconstructive surgery armamentarium. Tissue expansion allows to reconstruct even large cutaneous defects with an optimal matching of donor tissue to recipient site. Moreover, flaps obtained by tissue expansion are usually innervated and well vascularized (1-29). Anyhow, the scalp has peculiar anatomic characteristics that affects its expansion, as the presence of hairs and galea aponeurotica (30-52). Particularly in this regard, some details regarding preoperative planning of tissue expansion are of the utmost importance for obtaining a successful result, the more important of them will be detailed hereinafter.

Surgical technique

We may identify anatomical, technical, and psychological considerations, all equally important.

Anatomical considerations

Galea aponeurotica (or galea capitis) is a tendon-like structure between the pericranium and

the subcutaneous adipose tissue. The first point to underline is that a tissue expander in the scalp has always to be positioned under the galea aponeurotica. This is because the vascularization of the scalp is intimately connected with galeal upper surface. Trying to undermine the galea from above would lead to a deleterious loss of vascularization of the scalp.

If we place a tissue expander under the galea, its anelastic behavior will delay the process of scalp expansion. To obtain an equal volume of filling, a 50% more of time is usually requested when comparing scalp expansion to other body regions.

Another distinctive feature of the scalp is the presence of hair bulbs. A significant percentage of male patients will experience androgenetic alopecia of various degrees during their lifetime. Since occipital hair bulbs are usually not affected by male-pattern baldness, in terms of hair coverage, the occipital regions are to be preferred when positioning an expander in a male patient.

Technical considerations

Unlike semi-spherical or crescent expanders, rectangular ones allow to develop the maximum projection along the entire support base. Bearing this

fundamental point in mind, it is always better to prefer rectangular tissue expanders (Fig. 1), optimizing results of scalp expansion.

For the same reason, when using a rectangular tissue expander, is always mandatory to place it with its longer and narrower face as a base (Fig. 2).

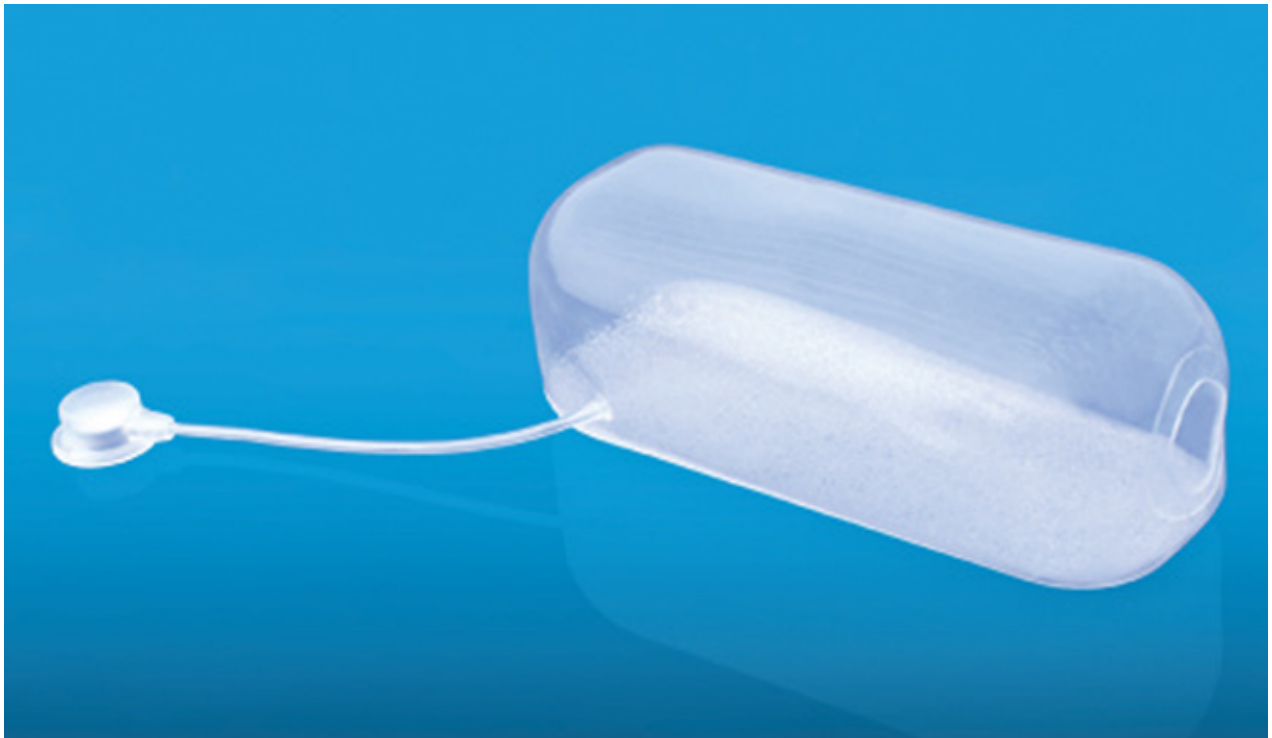


Fig. 1. Rectangular tissue expander.

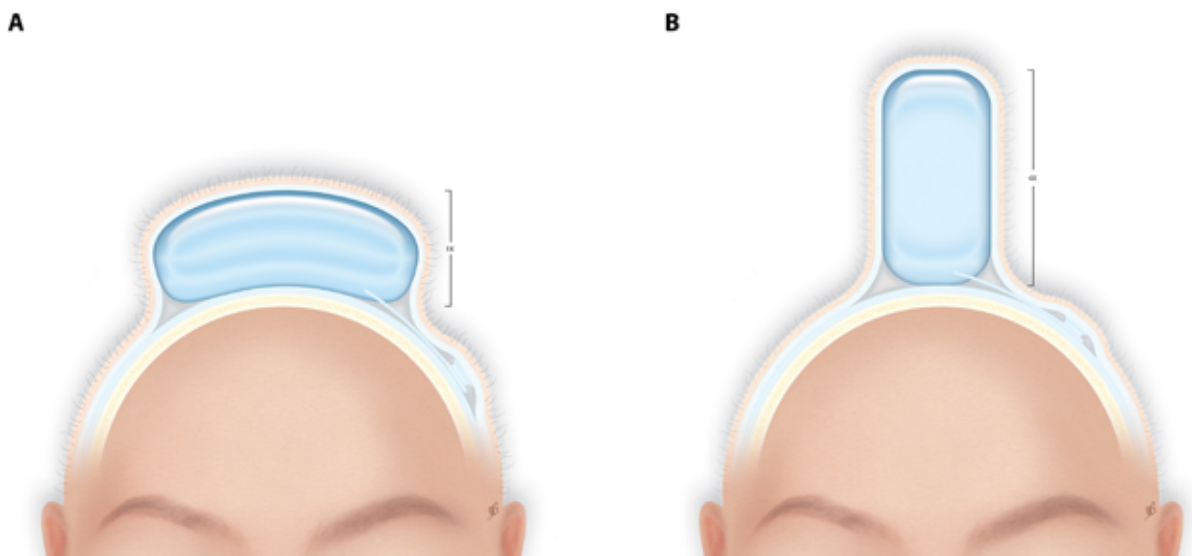


Fig. 2. a) Tissue gain (1x) obtained with horizontal placement of the expander, b) tissue gain (4x) obtained with vertical positioning of the expander.

This will allow to quadruplicate the projection and, consequently, tissue gain.

Psychological considerations

As described above, scalp expansion is a long process, being its mean duration usually more than three months. During this period, and particularly at the end of the expansion, the patient must face a socially important deformity. It is of the utmost importance to

accurately detail this point during the initial consultation. Some patients may underestimate this factor, leading to a failure of the procedure with the patient asking for premature expander's removal.

Conclusions

In scalp reconstruction, the use of tissue expansion allows to obtain successful results (Fig. 3).



Fig. 3. Extensive scalp scar resulting from burn, a) lateral view, b) frontal view; c) at the end of a three-month expansion period (rectangular expander placed in a vertical position); d) post-operative results. Anyhow, it is mandatory to follow some basic rules, dictated by anatomical and technical considerations, for optimizing results and avoid complications.

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

Informed Consent: Written informed consent was obtained from the patient concerned.

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