

SCALP EXPANSION FOR RECONSTRUCTION OF POSTBURN ALOPECIA IN CHILDREN: TWO CASE REPORTS

HACENE HAMMOUD¹, ADEL GUIDOUM¹, NORA MIMOUNE^{2,3*}
AND RACHID KAIDI³

¹Department of Oral and maxillofacial Surgery, Central Hospital of the Army, Kouba, Algiers, Algeria.

²High National Veterinary School (HNVS), Bab-Ezzouar, Algiers, Algeria.

³Institute of Veterinary Sciences, Laboratory of Biotechnology Related to Animal Breeding (LBRA), University Saad Dahleb, BP: 270, Soumaa Road, Blida, Algeria.
Email: nora.mimoune@gmail.com

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Case Report

ABSTRACT

It is obvious that adults expect to lose some hair with the age, but hair loss in children can be considered as an alarm, especially when they show psychological problems because of the bald spots or thin hair. However, burns of the head region remain very frequent in children; they are mainly caused by scalds with boiling fluids during home accidents. This leads to severe sequelae, post burn alopecia. Several reconstruction methods are described in the literature (hair grafting, serial excision and local scalp flaps, scalp expansion); the two firsts methods require small burn area and good scar quality. However, in our experience, scalp burn in children result in large surface of poor quality alopecia scar making tissue expansion the most effective procedure in this indication. We report two cases of burn alopecia reconstruction using expanded flap of scalp in 8 year old children. We describe the scar characteristics, the 2 stages procedure of scalp expansion and post-operative period follow up and the results. In the end, these two cases illustrate perfectly the effectiveness of tissue expansion in this region with a good cosmetic results and positive psychological and social effect.

Keywords: Burn alopecia; tissue expansion; scalp reconstruction; children.

INTRODUCTION

In the pediatric population, cutis aplasia, scalp avulsion, and burn injuries are the leading causes of scalp alopecia that is evaluated for reconstruction by plastic surgeons. Scalp alopecia is seen in 25% of children who suffer burn injuries of the head and neck. These injuries are rarely isolated to the scalp, and the adjacent structures are often affected. This may complicate reconstruction surgery and necessitate multiple reconstructive procedures [1, 2].

Burn alopecia is not only a physical and cosmetic sequela, but also a psychological

problem, especially in children in school age, with loss of self-esteem and social isolation. The primary goal of reconstruction for burn alopecia is to recreate the natural hair-bearing appearance on the reconstructed scalp and preserve hair growth patterns and hairlines for a cosmetically appealing result [3,4,5].

Among several techniques described in the literature (hair grafting, serial excision and local scalp flaps), the most relevant reconstruction method is tissue expansion; it allows the reconstruction of large alopecic scars with the same hair bearing tissue from adjacent healthy scalp [4,6].

The two cases described below are exposed to scald burn of the head region when they were 2 years old leading to a large alopecic area and reconstructed 6 years later with tissue expansion procedure.

CASE REPORTS

Case 1

8 year old boy suffered from post burn scalp alopecia in the frontal and right

temporal region (Fig. 1. a, b). A 400 mL crescent-shape tissue expander with a remote internal valve was implanted in a subgaleal pocket. A gradual inflation is begun 2 weeks later with a saline solution to reach 650 mL in 4 months (Fig. 1. c, d). Then, the second stage of the procedure is performed, the expander is removed and a large scalp flap is raised and mobilized in an advancement-rotation manner allowing the covering of the alopecic zone after scar excision (Fig. 1. e, f).

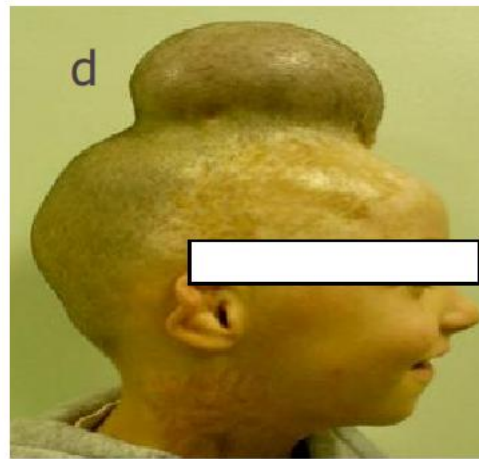




Fig. 1. a, b. Postburn alopecia of the frontal and the right temporal region. c, d. end of the inflation procedure, 650 mL in one expander in the subgaleal layer. e, f. postoperative photos after the scar excision and the reconstruction with and expanded rotationadvancement scalp flap

Case 2 (Fig. 2)

8 year old boy present with post burn alopecia in the frontal, parietal and right temporal area. Two expanders are inserted in a subgaleal pocket in the surrounding healthy hair bearing skin, one is 300 mL crescent-shaped and the second is 100 mL rectangular, both connected to a remote

internal valve. The expanders are overinflated serially to 350 mL and 200 mL, respectively. The right internal valve failed during the inflation period and was substituted with an external one under local anesthetic. Finally, a rotational-advancement flap is used to reconstruct the defect after scar excision in the second stage of the procedure.



Fig. 2. a, b. Patchy alopecic scar of the frontal, parietal and right temporal area



Fig. 2. C. Two expanders in place prior to the second stage of the procedure, the cicatricial area is outlined



Fig. 2. d,e. Postoperative result, reconstruction of the hole alopecic area with an expanded rotation-advancement flap (note the hair orientation which is perfectly reestablished)

Satisfactory results are achieved in both cases in term of skin quality and hair orientation resulting in a good aesthetic appearance.

DISCUSSION

Scalp alopecia is seen in 25% of children who suffer burn injuries of the head and neck [3].

McCauley et al. [4] have developed a classification scheme that serves as a guideline in planning the operative care. Patients are classified as type I, uniform alopecia; type II, segmental alopecia; type III, patchy alopecia; and type IV, total alopecia.

Because the alopecic scar resulting from burn injuries is usually large and has a precarious blood supply, neither hair grafting nor the only excision-local flap procedures could be a good reconstruction option. Therefore, tissue expansion remains the best technical choice for this sequela [5].

Tissue expansion is a two-stage procedure that takes 2 to 5 months period to be accomplished and could be a source of temporary disfigurement and discomfort to the patient, so clear explanation should be provided to the child and his parents [6].

First, one or two silicone expanders are implanted in a subgaleal pocket with an avascular plane easy to dissect in the adjacent healthy scalp, connected to an internal remote injection port (we think it is safer than the incorporated port model and more practical than the external port). The choice of putting one or two expanders depends on the location and the surface of the alopecic area and the availability and distribution of the remnant hair-bearing scalp. Although the rectangular shape is the most tissue surface provider, the crescent and

round shape expanders are more adaptable to the calvaria region.

The inflation with normal saline solution is begun 2 weeks after the implantation, so that we are sure of the operative wound healing, it is undergone with a 23 G butterfly needle to avoid damaging the injection port, and carried out serially and gradually once or twice a week (10 to 20 % the maximum capacity); the scalp expansion is then safe. In our practice, we usually overinflate the expander without any trouble up to 2.5 times the maximum capacity [7].

The scalp has a rich vascular supply from 5 arteries, so we have a large choice of the based pedicle.

The hair orientation should be respected and the mobilization manner of the expanded flap is designed to respect it. Rotation-advancement flaps are more often used rather than simple advancement flaps.

Complications may occur during tissue expansion procedure, local infection, hematoma, expander exposure, Injection port failure but if adequate technique is performed and serious follow-up is done most of these complications can be avoided. In children, a temporary bone deformation usually occurs after the inflation period, caused by the expander pressure but it is reversible and without any consequences.

CONCLUSION

Since the head is a very visible area, burn alopecia has a big impact in cosmetic appearance leading to loss of self-esteem and unhappiness, particularly in pediatric population. These two cases illustrate perfectly the effectiveness of tissue expansion in this region with a good

cosmetic results and positive psychological and social effect.

CONSENT AND ETHICAL APPROVAL

All the experiments were carried out according to the guidelines of the Department of Oral and maxillofacial Surgery, Central hospital of the Army, Kouba, Algiers, Algeria and with the consent of the patients.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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