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Our experiences on the reconstruction of lateral scalp burn alopecia with tissue expanders

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ABSTRACT

Introduction: Cicatricial alopecia is a form of hair loss that causes both cosmetic and psychological concerns. Although tissue expanders are the common approach to reconstruction, no algorithm exists in the literature for this process. In this study, it was aimed to create an algorithm for the reconstruction of lateral scalp alopecias with the goal to achieve better and standardized results.

Materials and methods: Lateral scalp alopecias were divided into three groups: total lateral alopecia (type I), temporal and sideburn alopecia (type II), and sideburn alopecia (type III). Tissue expanders were placed at the parieto-occipital area in type I defects, parietal area in type II defects, and the temporal region in type III defects. Tissue expanders were used to create flaps that were advanced with 60° rotation, 90° rotation, and no rotation for type I, II, and III defects, respectively.

Results: Fifteen patients were treated with this algorithm. Using this simple approach, we achieved natural, standardized aesthetic results for each patient, all of whom were satisfied with the final results.

Conclusion: Although the number of case were limited, the ideal and standardized cosmetic results could be obtained by this approach.

1. Introduction

Scalp alopecia secondary to burn injury is a serious problem for patients. The injury not only creates a physical deformity for the patient, but the alopecia has psychological implications as well. This may lead to social phobia and severe psychological trauma, forcing patients to conceal the zones of alopecia with hats, hairpieces, and wigs. Although these camouflage materials are common and useful for the vertex of scalp, lateral scalp alopecia (sideburn, temporal, and temporo-parietal alopecia) cannot be completely camouflaged with these apparels. The conspicuous anatomic zone makes the restoration of lateral scalp alopecia quite important compared to the other parts of the scalp.

Many treatment alternatives such as reduction techniques, hair grafting, and skin extension and expansion techniques with local or free flaps have been described for cicatricial alopecia reconstruction [1–6]. However, all of these techniques, with the exception of expansion, have limited application for large zones or total lateral scalp restoration [7–9]. Consequently, tissue expansion has been the most commonly used method for many years due to its advantages, mainly

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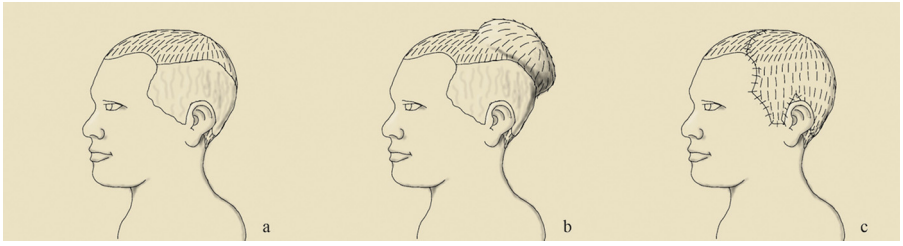

Fig. 1 – Type I defect, total lateral scalp alopecia (a), placement of tissue expander at the posterosuperior margin of the defect (b), advancement of the expanded flap and 60° rotation at the distal portion (c).

including providing large hair-bearing scalp tissue with acceptable hair density and facilitating primary closure of the donor area [10–12].

In fact, success with the expansion process usually depends on the size and location of the lesions, proper selection of tissue expanders and donor area, effective expansion, and appropriate transplanting of the expanded hair-bearing scalp. Even though tissue expansion is an effective and popular method for scalp reconstruction, the surgical treatment may result in unexpected, displeasing, and unnatural cosmetic outcomes. The main reason for this problem is the absence of a treatment algorithm that would guide surgeons through the priority zones of reconstruction, as well as location of tissue expanders and flap transplanting methods.

In this study, we aimed to present our experience with tissue expander reconstruction of sideburn, temporal, and temporo-occipital alopecia and propose a treatment plan (algorithm) for guiding the surgeon to choose the appropriate treatment method.

2. Materials and methods

Seventy-two patients underwent scalp alopecia reconstruction with tissue expanders in our unit between March 2001 and July 2012. Fifteen of them, who met the classification criteria, were included in the study and had tissue expander reconstruction of lateral scalp alopecia due to the algorithm, prospectively.

First, lateral scalp alopecia types were classified based on the localization of the scar tissue to form an algorithm (Table 1). It was difficult to define the distinct boundary of the area of alopecia because of the patchy appearance between anatomic zones. We used the major location of the burn scar as the primary area of alopecia. According to this classification method, areas of alopecia were divided into three groups: type I, with the zone of alopecia including the sideburn, temporal area, and extending to the occipital area (alopecias that were beginning from the preauricular region and extending to the posterior margin of processus mastoideus, three cases); type II, with the zone of alopecia including the sideburn and temporal area (alopecias, which were located between preauricular line and posterior margin of the processus mastoideus, seven cases); and type III; which included isolated sideburn alopecia (alopecias that were located at the anterior part of the preauricular line, five cases) (Figs. 1a, 2a and 3a).

Next, we considered the localization of the tissue expander. Tissue expanders are usually placed adjacent to the defect zones in any reconstruction process. Thus, we placed the expanders at the posterosuperior margin of the zone of alopecia (parieto-occipital area) in type I alopecia, at the parietal area in type II alopecia, and at the temporal area (posterior margin of the zone of alopecia) in type III alopecia (Figs. 1b, 2b and 3b).

The third and most important factor for achieving a good result is the transplanting method of the expanded flap. The planning of the flaps was made according to hair directions of the recipient site to obtain an optimal aesthetic result. Scalp alopecia reconstruction was performed with advancement flap with 60° rotation at the distal portion in type I alopecia, 90° rotational flaps in type II alopecia, and advancement flaps without any rotation in type III alopecia. Additionally, all flaps were cut at the superior part of the helix to provide a better temporal and parietal hairline (Figs. 1c, 2c and 3c).

All operations were performed under general anesthesia. A W-plasty incision was made within the border of the alopecia zone, and a pocket was created under the galea aponeurotica, which was determined through the algorithm. Then two separate pockets were created for the tissue expander and the filling reservoir through the same incision. After a carefully

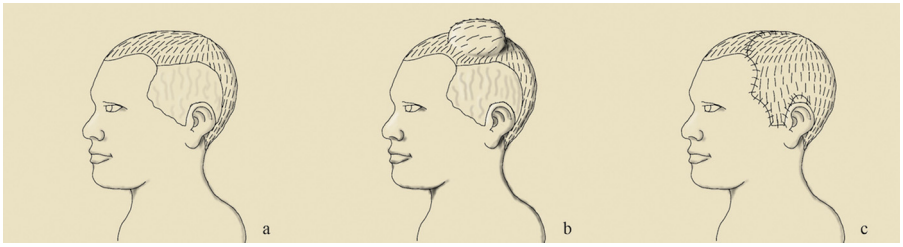

Fig. 2 – Type II defect, temporal and sideburn alopecia (a), tissue expander was located to the parietal zone (b), reconstruction with 90° rotational flap (c).