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# Prefabricated Expanded Occipital Flap for Recostruction of Postburn Cicatericial Alopecia in the Mandibular and Preauricular Regions in Male

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## ABSTRACT

Since, 1999, 5 cases of post burn cicatericial alopecia affected the mandibular and the preauricular areas in male. The prefabricated expanded occipital flap was designed to provide adequate solution for these defects. The method and results were discussed.

## INTRODUCTION

Post burn cicatericial alopecia in the face of the male requires special design not only to eliminate the cicatrix, but also to provide hair in the preauricular and mandibular areas. Another problem is present in association of these above two, the direction and density of hair. The problem may be more distressing if the donor areas are limited or restricted or suffered another lesion. The mandibular and the preauricular areas in adult male showed hairy zones which can not be reconstructed by conventional methods, they required skin with its hair to be considered as the donor. The most suitable and near by areas as donor are the temporal and the parietal regions. But some times a bold male without hair in the vault or the temporal area was injured also, these may be accompanied with the alopecia due to burn in the preauricular area and the mandible. Many authors and researches reported pedicle scalp flaps **[5]** or tissue expander application to reconstruct these lesions mentioned above **[2]**. These procedures had its results with controversy as respect the aim, and the demands. The cosmetic results affect the psychological situation of the suffered person which implicates also upon his social, and work relationship. The use of occipital expanded flap was reported **[1]** for reconstruction of the temporal area, a design that inspired us to use it for the reconstruction of these two areas to overcome many obstacles presented with these lesions.

## MATERIAL AND METHODS

Five adult males, their age ranged from 24:32 with an average of 26 years. One of them was paramedical personnel; the other 4 were manual workers. All of them have a certain degree of education. They suffered their lesions due to scalds by hot water during childhood in 4 cases and one only suffered his lesion due to chemical burn by a concentrated acid. The lesion was isolated as preauricular and mandibular defect in one case and associated with scalp defect in the temporal area in 3 cases as well as neck and axillary's lesions in the last case suffered chemical burn. Although, the mandibular and preauricular lesions did not have a functional disability, but they were the most annoying complaint by all patients.

As regard the defect dimensions, they ranged between 8x13cm; 5x7cm with an average of 6.5x10. The surface area of these defects ranged between 104cm$^2$: 35cm$^2$ with an average of 71cm$^2$. The defects were irregular in shape and variable in size.

The flap was designed in the occipital region according to the surface area required, the transverse and the longitudinal axis of the defect. The expander was chosen to give double the surface area required and the two axis of the defect. In all cases we used a round expanders, their volumes ranged between 500cm$^3$; 750cm$^3$ with projection of 6:6.9cm and a base of 10:15cm.

The transversely designed flap in the occipital region must be taken into consideration to put the vertical axe of the defect to be the base diameter of the expander and the transverse axe of the flap to be the projection of the expander. After full expansion of the donor area which was the occipital area. When we reached double the surface area

required, half of it used to reconstruct the defect and the other half to close the donor area primarily.

The flap is designed to be transversely situated in the upper half of the expanded area with a perpendicular skin paddle in its distal end. The superior incision was made through the whole length of the flap taking into consideration the skin paddle, but the inferior one was in the middle the expanded are stopped at its middle then the incision became perpendicular in the second half as shown in Fig. (1). Then, the flap was rotated 90 degrees to be fixed against the defect with the expander base diameter in the longitudinal axe and the projection of the expander in the transverse axe of the defect (Fig. 2). The flap was rotated and fixed in its place in 4 cases as there were temporal defect associated with the preauricular and mandibular alopecia, and it was jumped pedicle in one case as the patient lesions were isolated preauricular and mandibular alopecia (Figs. 3-A,B,C,D, 4-A,B & 5-A,B,C,D). The process of expander insertion and flap rotation were accompanied by low suction drain which was removed in the 3rd to 5th day postoperative. The hospitalization time ranged between 8:10 days concerning both cessions (the insertion of the expander and the flap reconstruction after 21 days). In the time between the two cessions, the patient was cared in the out patients clinic for inflation of the expander twice to three times weekly. All cases were under cover of antibiotic therapy and analgesics when needed.

## RESULTS

All expansions passed without complications during the stage of inflation. And the two to three weekly injections were tolerated well by all patients in the outpatient clinic. The flaps rotation were fixed well against the defects, and the jumped flap which was done in one case showed smooth post operative follow-up and its pedicle was separated after 21 days without any complication. All flaps were versatile and its circulation were intact. The only draw back presented with this technique was the presence of dog ear at the lower edge of the rotated flap which was corrected 6 months after the rotation of the flap without farther complication. The first case was prematurely corrected after one month of flap rotation which resulted in mild degree of hair loss due to disturbance in the blood flow. The hair direction and its density were matched well with the hair in the recipient site. No flap loss or distal flap necrosis occurred and the follow-up was prolonged for three years without farther complications. (Fig. 3-A,B,C,D) showed the pre and post operative views of the prefabricated expanded transversely situated occipital flap with its perpendicular skin paddle for reconstruction of the temporal and preauricular alopecia.

Fig. (4-A,B) showed the occipital expansion and late postoperative results after flap rotation of the transversely designed occipital flap with its perpendicular skin paddle for reconstruction of big alopecic area affected the temporal and preauricular region.

Fig. (5-A,B,C,D) showed irregular mandibular hair loss due to burn, and reconstruction using the jumped pedicle flap from the occipital region. In all cases the hair direction and the edges of the flap matched well with the recipient site.

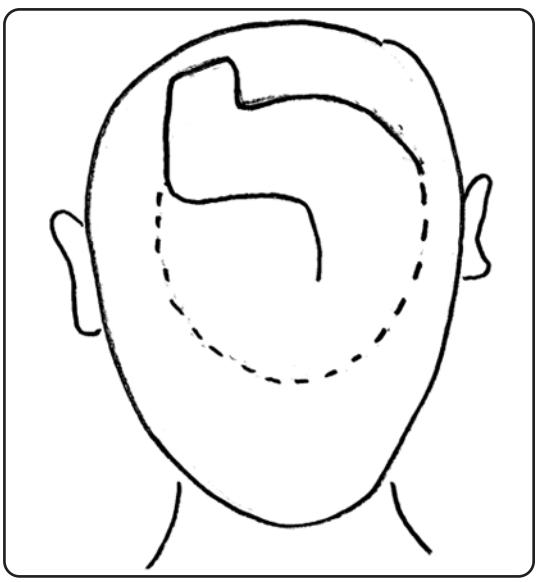

Fig. (1): Flap design in the occipital expanded area with transverse situation and perpendicular paddle.

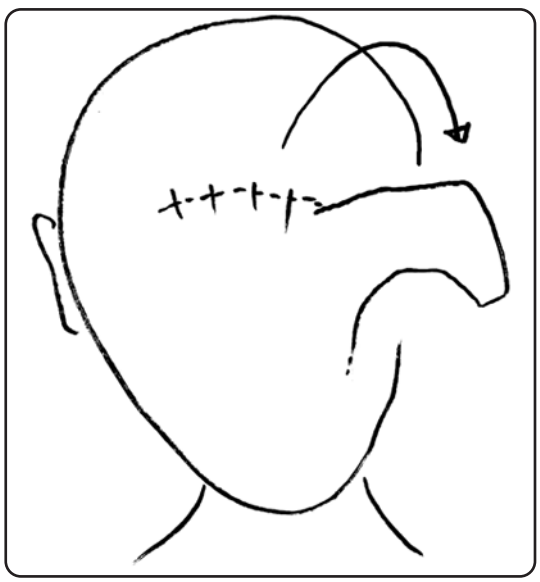

Fig. (2): Flap 90 degrees rotation to be fixed against the defect.

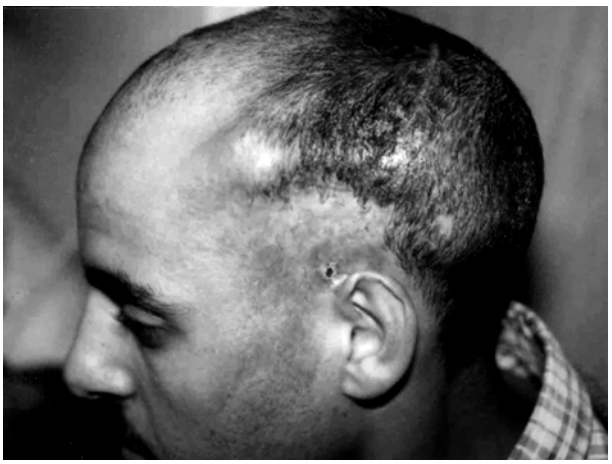

Fig. (3-A): Post expander insertion and preoperative flap rotation.

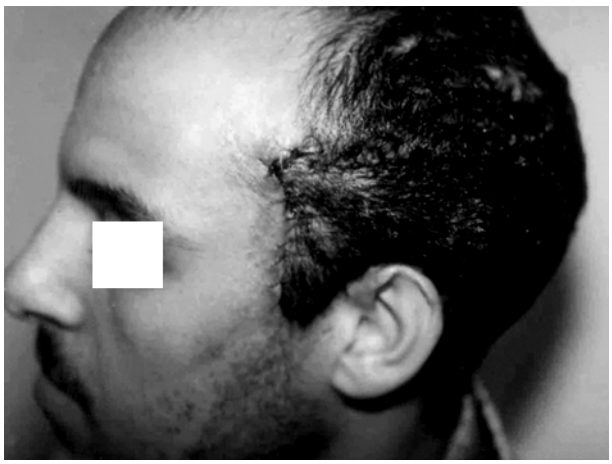

Fig. (3-B): Immediate post operative result after flap rotation.

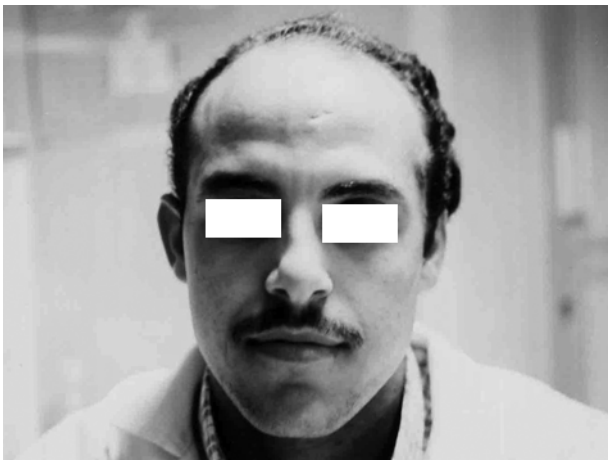

Fig. (3-C): Late postoperative front view (after one year).

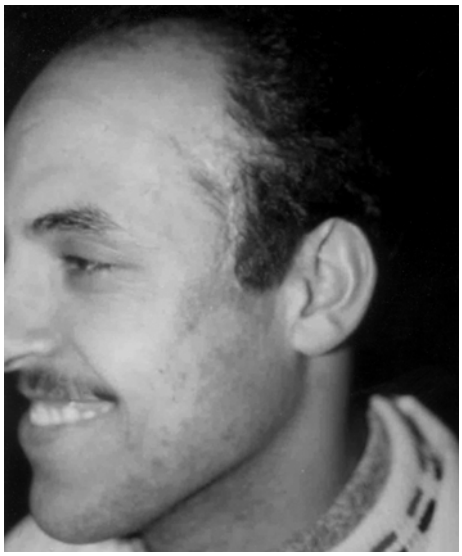

Fig. (3-D): Late postoperative lateral view (after one year).

Fig. (4-A): Preoperative flap rotation with expanded occipital area.

Fig. (4-B): Late postoperative view after one year.

Fig. (5-A): Preoperative front view.

Fig. (5-B): Preoperative lateral view.

Fig. (5-C): 6 months postoperative after application of occipital jumped flap and its separation.

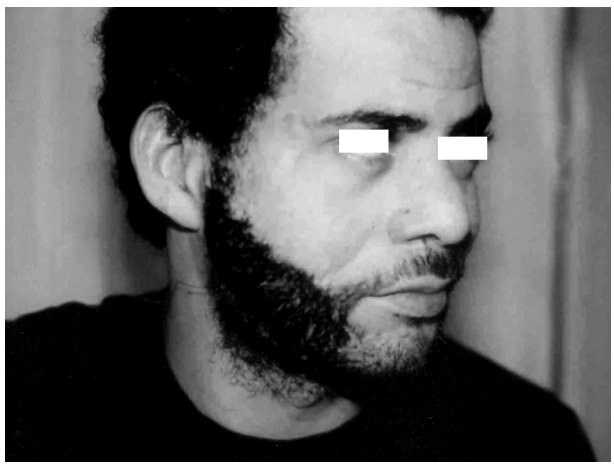

Fig. (5-D): 6 months postoperative lateral view.

## DISCUSSION

The problems in these cases were, scanty hair in the parietal region, cicatericial alopecia of the temporal region, presence of alopecia in two levels (one perpendicular on the other), and the direction of hair in the temporal, preauricular and the mandibular areas which are normally directed downward.

The reconstruction of these lesion by tissue expansion of the nearby donor tissues were simple and easy **[3,4]** but it was not available in all cases as the donor area may be small to give the surface area required for reconstruction, or it has scanty hair or even show boldness. The presence of cicatericial alopecia in the near by tissue added another obstacle. The application of advancement flap has its drawback as most of it showed 30% postoperative retraction after one year, a complication that decreases the outcome of the procedure.

The application of micro graft hair implantation has a very limited role in the reconstruction of these defects as the underlying fibrosis prevents the adequate take of this micro graft with complete loss of the implanted hair.

The role of tissue expansion and flap rotation **[1]** was augmented by the new design reported in this work as it overcame the presence of boldness, or cicatericial alopecia in the near by tissue. Another advantages present with this technique are the normal hair direction of the occipital area matched well with the normal hair direction in the temporal, preauricular and mandibular regions, also the rotated flap showed very mild stretch back phenomenon that decreased the surgical scars width.

The prefabricated expanded occipital flap with perpendicular paddle provided good solution to overcome the alopecia in two levels; also it gave one procedure for these two lesions accompanied with the above mentioned advantages. Also, the mathematical and geometrical strategy provided adequate planning for expander choice as regard its volume, dimensions and shape. It was noted that the expansion strategy is surface area rather than the simple rule of its radius. A strategy that changes a lot in the tissues expander application.

The tedious dissection of the occipital region is one of the disadvantages of this technique. Also the presence of dog ear in the inferior border of the rotated flap added another disadvantage. But we can not consider the last one as a permanent complication as it was easily corrected after 6 months under local anesthesia as it showed marked recession in its volume and size. Considering tedious dissection and its stress, surgeons are already dealing with the job of stress all the time.

*Conclusion:*

We concluded that the prefabricated expanded occipital flap with perpendicular paddle is a valid technique for reconstruction of the post burn cicatericial alopecia affecting the preauricular and the mandibular regions due to its advantages.

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