

Nasal Reconstruction with the 3-step Forehead Flap

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Abstract

Case Report

Covering the nasal defects represent a difficult challenge for the plastic surgeons, many techniques have been described in the literature but none has given good aesthetic results. In this article, we will describe the case of a patient who has a transfixing nasal defect, reconstructed by the 3-step forehead flap, as used in the department of reconstructive and plastic surgery of the Ibn Sina hospital in Rabat.

Keywords: Nose defect, nasal reconstruction, forehead flap.

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INTRODUCTION

Nasal reconstruction remains the historic centerpiece of plastic surgery, and the forehead flap, the workhorse of repair [5].

Because of its ideal color and texture, forehead skin is acknowledged as the best donor site with which to resurface the nose. However, all forehead flaps, regardless of their vascular pedicles, are thicker than normal nasal skin. Traditionally, the forehead is transferred in two stages. At the first stage, frontalis muscle and subcutaneous tissue are excised distally and the partially thinned flap is inset into the recipient site. At a second stage, 3 weeks later, the pedicle is divided. However, such soft-tissue "thinning" is limited, incomplete, and piecemeal. Flap necrosis and contour irregularities are especially common in smokers and in major nasal reconstructions. To overcome these problems, the technique of forehead flap transfer was modified. An extra operation was added between transfer and division [2].

CASE REPORT

This is a 72-year-old patient, with no medical history, who was admitted to the reconstructive and plastic surgery department of the Ibn Sina hospital in Rabat, for treatment of an infiltrating-type basal cell carcinoma in the nose.

Excision of the tumor, with a 1cm margin, left a transfixing defect in the tip and the nasal wing,

reconstruction was performed using the 3-step forehead flap technique.



Figure 1: Before and after excision of a basal cell carcinoma of the nose, we notice a transfixing defect in the tip and the alar wing

DISCUSSION

Since it was modified by F. Mennick [1-5], the 3-step forehead flap is the technique we use for covering nasal defect, it is a reliable flap, which allows reconstruction of superficial or transfixing defects of the nasal region.

The surgical technique has several peculiarities; this flap is performed in three steps, with an interval of 3 weeks between each operating stage.

First Step

The preoperative markings is performed the morning of the intervention, we start by locating the point of emergence of the supratrochlear artery which corresponds to the pedicle of the flap, then the defect is traced on a paper and redrawn on the forehead, after checking the axis of rotation of the flap. An extension of the flap has also been marked, and it is destined to the deep plane reconstruction.



Figure 2: Pre-operative markings of the flap, the defect is marked on aluminum paper and redrawn in the forehead

After complete excision of nasal subunits to be reconstructed, the flap is elevated to full thickness carrying the frontal muscle.



Figure 3: The flap is elevated in full thickness, after excision of the hemi tip and alar wing

The rotation of the flap should always be on the side of the nose, because this allows easier rotation and less traction on the eyebrow.

We start reconstructing the deep plane, the distal part of the flap is folded and sutured with absorbable stitches, and then the flap is sutured in its recipient area (in this case, the tip and the nostril wing). The forehead defects is sutured after detachment.

The deep part of the pedicle can be grafted with skin to reduce secretions and bleedings, and to improve patient comfort.



Figure 4: Immediate post-operative aspect of the 1st Step

After this first stage of operation, the flap is thick; the excision of the excess frontal muscle will be performed in the second stage, as well as the definition of the aesthetic lines of the nose.



Figure 5: 3 weeks post-operative aspect of the 1st step, the flap is thick and will be refined during the 2nd step

Second Step

3 weeks after the first operative step, the flap is elevated in a subcutaneous plane, leaving the frontal muscle in place and the distal extension, which served to reconstruct the deep plane.

The excess muscle leaved is resected depending on the thickness desired for reconstruction.

A cartilage graft, taken from the concha, is performed on the tip, to provide support and give it definition.



Figure 6: Cartilage graft after elevating and thinning the flap, leaving the distal extension destined to reconstruct the deep plane

The flap is then sutured by adding some Capiton-type stitch to redraw the aesthetic lines of the nose, in this case the nostril wing.



Figure 7: Immediate post-operative aspect of the 2nd step, the aesthetic lines of the nose was marked using some Capiton-type stitch

Weaning of the flap will not take place until the 3rd step, 3 weeks later.



Figure 8: 3weeks post-operative aspect of the 2nd step, the flap is thin and perfectly cover the defect

Third Step

In the 3rd step, the pedicle of the flap is divided, the distal part of the flap intended to cover the defect is healed, and the skin resection is then performed to corresponds perfectly to the size of the nasal sub units to be reconstructed, in this case the hemi tip and the nostril wing.

The eyebrow is then replaced at its initial position, at the same level as the other eyebrow, because the pedicle of the flap often tends to pull lower the eyebrow.



Figure 9: immediate post-operative aspect of the 3rd and final step, the sutures was made with Prolene



Figure 10: 2weeks post-operative post-operative aspect, the 3-step forehead flap offer the best aesthetic outcome

CONCLUSION

The aesthetic result of the 3-step forehead flap is excellent, taking the frontal muscle minimizes fibrosis and therefore retraction of the flap. A second step is added to remove the excess frontal muscle, placement of the cartilage graft and definition of the aesthetic lines of the nose. The final result is obtained after dividing the pedicle, at the third step.

The 3-step forehead flap is the best way to reconstruct all types of nose defect, transfixing or not, affecting one subunit or the entire nose, this technique far exceeds all other techniques described for nasal reconstruction, in terms of aesthetic outcome.

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