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Nose Reconstruction of Post Traumatic Defect

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Abstract

Nasal reconstruction following trauma represents a major challenge in reconstructive surgery due to the anatomical and functional complexity of this organ. We report 21 cases of post-traumatic rhinoplasty treated in our department. The mean age of the patients was 31 years, with a predominance of male patients. The etiologies varied. Reconstructions were performed using locoregional flaps augmented with cartilage grafts. The immediate postoperative course was uneventful, and the functional and aesthetic results were satisfactory. Our results confirm the efficacy of locoregional flaps combined with autologous cartilage grafts in post-tranumatic nose.

Keywords

Nose Reconstruction, Nasal Trauma, Nasal Defect, Rhinpoiesis, Frontal Flap, Nasogenien Flap

1. Introduction

The nose plays a central role in the aesthetics and function of the facial complex. Its complex three-dimensional structure combines a skin envelope, an osteocartilaginous framework, and an internal mucosal lining that ensures the patency of the upper airways [1] [2].

Any loss of nasal tissue, therefore presents a major surgical challenge requiring reconstruction that respects these three anatomical planes in order to restore both respiratory function and facial harmony.

Loss of nasal tissue can result from multiple causes, including trauma, human or animal bites, burns, ballistic trauma, and tumor resections [3] [4].

Among these causes, facial trauma is a common etiology and often results in complex tissue defects involving multiple aesthetic subunits of the nose. Human

bites represent a distinct mechanism characterized by a high risk of infection and irregular tissue loss requiring specific management [5].

Rhinopoiesis refers to the set of nasal reconstruction techniques aimed at restoring the shape, structure, and function of this organ. Several surgical techniques have been described, including local and regional flaps and autologous cartilage grafts [2] [6]. Among these techniques, the paramedian frontal flap remains the gold standard for reconstructing extensive nasal defects due to its reliable blood supply and the similarity of the skin to that of the nose [6]. The nasogenian flap is also an effective alternative for alar or lateral nasal defects [7].

The objective of this study is to report our experience with 21 cases of post-traumatic rhinopoiesis and to discuss our results in light of the literature.

2. Materials and Methods

This is a retrospective descriptive study of 21 patients treated for post-traumatic nasal tissue loss in our department during 1 year from January 2025 to January 2026.

All the patient hospitalized in our department who got a nasal trauma and had a nasal defect were included, all the patient that have cancer and got surgery that causes nasal defect were excluded.

The data collected included age, sex, the cause of the trauma, the reconstructive technique used, postoperative outcomes, and any complications, as well as a satisfaction form completed by the patients.

3. Results

The mean age of the patients was 31 years, with a predominance of males. The primary causes of injury were traffic accidents and human or animal bites.

The nasal defect was different from a patient to another but most of patients had a full thikness nasal defect for patient who had point defect associated to alar cartilage and septalcartilage defect got frontal paramedian flap with septal reconstruction or costal cartilage due to their stregth, otherwise patients who had lateral defect alar defect got nasogenien flap and cartilage reconstruction by conchal cartilage due to his forme.

Thirteen patients underwent nasal reconstruction using a paramedian frontal flap (**Figure 1**), while eight patients underwent reconstruction using a nasogenian flap (**Figure 2**).

Figure 1. Nasal reconstruction with frontal flap and septum cartilage. ((A) First day of consultation face and profil, (B) First operatory time detersion of skin and preparation of the receiver site face and profil, (C) Set up of the cartilage septal face and profil, (D) Elevation and rotation of the frontal flap, (E) Set up and suture of the frontal flap, (F) 2 weeks after surgery, (G) 3 weeks after surgery, the weaning day).

Figure 2. Nasal reconstruction with nasogenien flap. ((A) Day 1 of con-sultation 6 month after the first suture, (B) Dermabrasion of the skin and preparation of the receptor site, (C) Cicatrisation complication due to an allergie, (D) Z plastie to be more aesthetic).

Cartilage harvest sites included the nasal septum, conchal cartilage, and costal cartilage.

Postoperative outcomes were clinically evaluated, and patients were followed up monthly. Flap release was performed on the 21st postoperative day.

All 21 patients had a favorable initial postoperative results with good flap viability and no necrosis or infection.

Flap release was performed on day 21, with an aesthetic result deemed satisfactory according to patientand the surgeon and a proper restoration of the nasal contour in 18 patients, while 3 patients were not satisfied also the surgeon so they required scar correction or fat removal.

One complication was observed in a patient in the form of an allergic reaction requiring hospitalization and intravenous medical treatment. A local Z-plasty was performed to improve scar healing.

Satisfaction for the post operative result was clinicaly approved by the surgeon and the patient by fillingthe satisfaction form given to them day 21 and verbaly in each consultation

During follow-up, all patients showed good integration of the cartilage grafts and a notable aesthetic improvement.

4. Discussion

Post-traumatic nasal reconstruction is one of the major challenges in facial reconstructive surgery due to the anatomical and functional complexity of the nose [1].

Restoring tissue loss requires three-dimensional reconstruction to recreate the three essential components of the nose: the skin covering, the cartilaginous framework, and the internal lining [2].

In our study, the mean age of patients was 31 years, with a predominance of males, which is consistent with international series on maxillofacial trauma. Indeed, several studies have shown that facial trauma primarily affects young adult males due to their greater exposure to traffic accidents and assaults [8]. For example, the study by Shokri *et al.* on nasal reconstructions following trauma reports a male predominance of over 70% with an average age between 25 and 40 years [9].

Regarding traumatic etiologies, our cases were related to either bites or traffic accidents. These mechanisms are frequently described in the literature as major causes of nasal tissue loss. Human bites, although relatively rare, are particularly feared due to the high risk of infection associated with the polymicrobial oral flora. In their study on the management of nasal bites, Stefanopoulos and Tarantzopoulou emphasized that these injuries often result in irregular tissue defects requiring staged reconstruction [10]. Similarly, Andrew *et al.* reported that frontal flap reconstruction is a reliable option for nasal tissue defects resulting from bites [11].

The paramedian frontal flap is considered the gold standard technique for reconstructing significant nasal defects. This technique, initially described in modern principles by Burget and Menick, relies on the supratrochlear artery for blood

supply and allows for three-dimensional reconstruction of the nose in multiple surgical stages [12]. In their series of over 200 complex nasal reconstructions, Menick reports a high flap survival rate with satisfactory aesthetic results [13]. The results obtained in our cases are consistent with these observations, with good flap integration and no major complications.

The nasogenian flap, used in 8 cases, is an effective alternative for reconstructing alar or lateral nasal defects. Several studies have demonstrated the versatility of this flap in the reconstruction of nasal defects. In their review of alar reconstructions, Mahesh *et al.* showed that the nasogenian flap allows for good matching of skin texture and color, while presenting limited morbidity at the donor site [7]. These results are consistent with those observed in our study.

Reconstruction of the nasal framework is an essential component of rhinoplasty. In our series, we used septal cartilage grafts in 7 cases, conchal cartilage in 12 cases, and costal cartilage in 2 cases. The use of autologous cartilage grafts is widely recommended in the literature to restore the structural support of the nose. According to Immerman, septal cartilage is particularly well-suited for moderate-sized reconstructions due to its rigidity and ease of harvest [14]. In contrast, conchal cartilage is often preferred for the reconstruction of alar structures due to its natural curvature, as described in several studies on post-traumatic nasal reconstructions [15].

The weaning of the flaps at day 21, performed in our series, corresponds to the timeframes classically reported in the literature. Indeed, several authors recommend weaning between the third and fourth postoperative weeks, a period necessary for flap neovascularization [13].

With regard to complications, our study reports one case of an allergic reaction requiring hospitalization and local Z-plasty. The most frequently reported complications in international series include partial flap necrosis, infections, hypertrophic scars, and secondary deformities [9]. In their study on nasal reconstruction following trauma, Salzano *et al.* report an overall complication rate of approximately 10% - 15%, sometimes requiring secondary corrective procedures [16].

Finally, several authors have emphasized the importance of a reconstructive approach based on the concept of nasal aesthetic subunits, described by Burget and Menick, according to which reconstruction must respect the natural anatomical boundaries of the nose in order to achieve an optimal aesthetic result [12]. This approach is now widely adopted in complex nasal reconstructions.

Thus, despite the limited number of patients in our study, our results appear generally consistent with international series. Locoregional flaps combined with autologous cartilage grafts constitute reliable techniques for achieving satisfactory functional and aesthetic results in the reconstruction of post-traumatic nasal defects.

5. Conclusion

Post-traumatic rhinopoiesis is a complex surgical procedure that requires recon-

struction taking into account the three anatomical planes of the nose. Local flaps, particularly the frontal flap and the nasogenian flap, combined with autologous cartilage grafts, are reliable techniques that yield satisfactory functional and aesthetic results.

Consent and Approval

This study received ethical approval from an institutional review bord and all the 21 patients consent to publish their faces without names and approved the study.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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