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Nasolabial Flap in Maxillofacial Gunshot Trauma: A Case Series

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Abstract

Introduction: The nasolabial flap (NLF) has many advantages in oromaxillary reconstruction, but the majority of cases are reconstructions after pathologic resections. Its usage in trauma surgery, especially in the management of gunshot wounds, is rarely mentioned.
Case Presentation: Three cases involving gunshot injuries to the face are presented: one for reconstruction of the nasal ala, another for bone graft coverage in mandibular reconstruction, and the third for the repair of premaxillary hard and soft tissue avulsive defects.
Conclusions: The NLF is a thin, pliable flap and is useful for intraoral and facial reconstruction of trauma patients with small to moderate soft tissue loss.

Keywords: Flap, Trauma, Reconstruction

1. Introduction

The nasolabial flap (NLF) has many advantages in oromaxillary reconstruction, but the majority of cases are reconstructions after pathologic resections. It is a simple flap that uses the skin reservoir lateral to the nasolabial fold for facial and oral cavity reconstruction. The flap pedicle can be superiorly, inferiorly, or centrally designed, and the flap has a wide range of motions including advancement, rotation, and transposition (1, 2). Its usage in trauma surgery is rarely mentioned. In a report by Ioannides and Fossion, only one case out of 16 intraoral reconstructions with NLF had a trauma etiology (3). Other single case reports for philtral and lower lip reconstructions after bite injuries have also been mentioned (4, 5). The authors' experiences in the management of gunshot injuries of the face in a trauma center are presented.

2. Case Presentation

2.1. Case 1

The patient was a 20-year-old man with an entrance wound under the chin and an exit wound in the nose due to a suicide attempt with a firearm. Most of the nose had been avulsed, but the paranasal skin was intact. The nose was reconstructed with a forehead flap. The results for the ala were unsatisfactory, so the left lateral ala was reconstructed with the NLF during forehead flap pedicle division (Figure 1).

2.2. Case 2

The patient was a 36-year-old policeman with an entrance wound in the back of the neck due to a firearm attack. The bullet had destroyed the lateral mandible and had entered the mouth through the mandibular alveolar ridge. He was referred to the authors with fragments of necrotic bones in the mouth, while a prophylactic tracheostomy was done for airway protection. An extraoral incision below the inferior mandibular border, from angle to angle, was used to gain access to the intact mandibular bone; the necrotic bone was debrided and a reconstruction plate was used for rigid internal fixation. A corticocancellous bone graft from the anterior iliac crest was used to restore the mandibular continuity, and an inferiorly based tunnelized NLF was used for bone graft coverage (Figure 2).

2.3. Case 3

The patient was a 24-year-old man who was injured due to a suicide attempt with a firearm. The entrance wound was beneath the chin, and the anterior mandible and the anterior maxillary bone had been destroyed with overlying soft tissue loss. The submentum was reconstructed with the infrahyoid myocutaneous flap, and the soft tissue of the premaxilla was reconstructed with the superiorly based nasolabial island flap. The proximal part of the flap was de-epithelialized and the flap was tunneled to reach the premaxilla. The flap survived without any problems, and there was no need for pedicle division (Figure 3).

Figure 1. One-Stage Nasolabial Flap is Used for Reconstruction of the Nasal Ala. Forehead Flap is Used for Dorsal Nasal Reconstruction

Figure 2. Reconstruction Plate and Bone Graft is Covered by Nasolabial Flap in a Trauma (Gunshot) Patient With a Lateral Mmandibular Defect Accompanied by Soft Tissue Loss

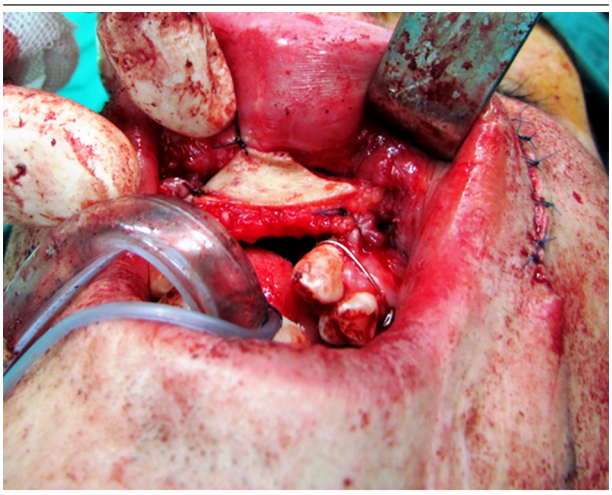

Figure 3. Nasolabial Flap is Used for Reconstruction of the Premaxilla in a Gunshot Victim

3. Discussion

In our series, unilateral NLFs were used for reconstruction after gunshot wounds to the face. All the patients were male. Bilateral NLFs are reported in the literature for elongating the short nose in a trauma patient, one for the nasal lining and the other for skin coverage concomitant with iliac crest bone grafting (6). In two cases presented in this article, there were no problems with the hairs in which this flap had been used for intraoral reconstruction. The inferiorly based NLF uses the skin lateral to the nasolabial fold, which inherently has no hairs. The superiorly based NLF used in the other case was not an extended variant and, therefore, did not involve the beard hairs. The extended variant NLF is a superiorly based flap with extra length that transfers the skin overlying the mandibular border. Thus, in male patients, this flap can transfer beard hairs into the oral cavity (7). In one case, the NLF was used for nasal reconstruction as an adjuvant complementary technique to the paramedian forehead flap. A turnover and folded NLF was used for reconstruction of the nasal ala. In the first case, this flap was more medially designed to prevent distortion of the reconstructed alar base. De-epithelialization of the proximal part in the NLF (between one- to two-thirds) was necessary for intraoral transfer by transbuccal tunneling (8). De-epithelializing the proximal part of the NLF changes the pedicled NLF to an island variant. This process combined with the tunnel technique (transbuccal or subcutaneous) are strategies for preventing the second surgical procedure that is necessary in interpolated NLFs (9). The amount of de-epithelialization depends on the length of the tunnel. For intraoral reconstruction, de-epithelialization of the proximal third (1.5 - 2.0 cm) is sufficient, while in columellar reconstruction, maximum de-epithelialization is needed because of the long length of the subcutaneous tunnel needed for the flap transfer. In comparison with situations in which the NFL was used for reconstruction after pathologic resections, using this flap with trauma patients means that the facial artery can be preserved, which guarantees vascularity of the NLF. Despite the fact that subcutaneous NLFs have a random pattern blood supply, if the facial artery is preserved, the reliability of the NLF will increase (10). The negative aspect of the NLF in trauma patients is with young patients, whose skin has less skin and is more prone to visible scarring, while this flap is recommended more often with elderly patients (11). A unilateral scar in the nasolabial region is also more noticeable than a scar that remains after bilateral NLFs. In the literature, NLF is rarely used for facial-intraoral reconstruction after gunshot wounds to the face, which comes from the fact that, in short-range, high-velocity gunshot injuries, the amount of soft tissue loss is far from the dimensions that can be covered with the NLF skin paddle (12). The NLF is a thin, pliable flap and is useful for intraoral and facial reconstruction of gunshot injuries to the face with small to moderate soft tissue avulsion.

Footnotes

Authors' Contribution: Dr Amin Rahpeyma: study concept and design, statistical analysis, administrative, technical, and material support and study supervision; Dr Saeedeh Khajehahmadi: acquisition of data, analysis and interpretation of data, drafting of the manuscript, critical revision of the manuscript for important intellectual content.

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