Original Article

Indications and Outcome of Nasolabial Flap: Experience at a Plastic Surgical Facility

Irfanullah *
Alamzeb Khan *
Naveed Khan*
Syed Asif Shah**
Tahmeedullah **

*** Registrar***
****Assistant Professor***
*****Associate Professor***

Department of Plastic Surgery, Hayatabad Medical complex (HMC), Peshawar.

Objective: To document the indications and outcome of nasolabial flap in reconstruction of facial defects caused by trauma, tumour ablation or infection.

Study Design: Descriptive study

Place and duration of the Study: This descriptive study was carried out in the Department of Plastic and Reconstructive Surgery, Hayatabad Medical Complex (HMC) Peshawar from Jan 2006 to Jan 2011.

Materials and Methods: All adult patients of either gender, who were admitted to our Department and underwent nasolabial flap coverage for their surgical defects, were prospectively included in the study

Results: Out of the 49 patients, 30(61.22%) were males and 19(38.77) were females. The patients ranged in age between 17-61 years with mean age of 41.83 ± 9.71 years. Tumour ablative surgery was the commonest cause of defects (83.63%, n=41). Nose was the most common site of the defects (n=19, 38.77 %).

All flaps survived completely. The colour match was good in all cases. The contour match was good in patients with nasal dorsum, lip and medial cheek defects while the patients with nasal tip and columella reconstructions needed further debulking procedures to get a contour match with the surrounding nasal tissue. The donor site healed well with no functional loss. There was no mortality in this case series.

Conclusion: The nasolabial flap is a versatile local flap that can be employed to resurface a variety of facial defects resulting from tumour ablation, trauma, burn injury or infection. It has favorable outcome in terms of survival, colour and contour match, donor site healing and overall functional outcome. Hence it can be considered as the workhorse flap for reconstructing moderate facial defects.

Key words: Nasolabial flap, Facial reconstruction, Nasal reconstruction.

Address for Correspondence
Dr. Irfanullah
Department of Plastic Surgery, Hayatabad Medical complex (HMC), Peshawar.
E-mail: drirfann@gmail.com

Introduction

The nasolabial flap is a versatile and time tested flap for reconstructing moderate facial defects.[1] It is based on the angular branch of facial artery, the infra orbital artery and the transverse facial artery.[2] Its lush vascularity allows it to be based superiorly or inferiorly.[3] It can be employed to reconstruct defects of the medial cheek, nose, lips and intraoral defects up to 5 cm wide.[4] The nasal, lower eyelid and cheek defects can be reconstructed with the superiorly based flap whereas the inferiorly based flap is effective for reconstruction of the lip, oral commisure and the anterior oral cavity.[3-5]

The outcome of facial defects depends not only on the cause and site of the defects but more importantly on the adequacy of appropriately instituted surgical procedure. In the developed countries effective reconstructive strategies have greatly improved the outcome of such visible defects on the face.

The present study was carried out to document the indications and outcome of nasolabial flap in reconstruction of various facial defects in our patients.

Materials and Methods

This descriptive study was carried out in the Department of Plastic and Reconstructive Surgery, Hayatabad Medical Complex (HMC) Peshawar from Jan 2006 to Jan 2011.

All adult patients of either gender, who were admitted to our Department and underwent nasolabial flap coverage for their surgical defects, were prospectively included in the study. Children below 14 years of age and those patients who did not consent to participate in the study were excluded. Initial assessment and diagnosis was made by history, physical examination and necessary investigations.

All the surgeries were performed under aseptic precautions in the operating theatre. Depending on the general status of the patient, general or local anesthesia was employed. The flap was designed immediately lateral to the nasolabial fold, such that the medial edge of the flap laid within the fold. When based superiorly the flap was tapered inferiorly for good closure of the donor defect, while in the inferiorly based design tapering was marked superiorly. The flap elevation started distally in the plane between the subcutaneous fat and the underlying muscles. The plane of dissection was kept just beneath the subcutaneous fat of the flap, superficial to the underlying facial musculature. Wide undermining of the adjacent cheek was done to close the donor defect primarily resulting in a linear wound lying within the nasolabial fold. The flap was either islanded or transposed with a skin pedicle to the recipient defect and insetting done. Postoperatively the flap was monitored for any colour or temperature change and capillary filling time.

The primary outcome measure was flap survival and secondary outcome measures included colour match, contour match, donor site morbidity, and functional outcome (in terms of complete wound closure without any of distortion of adjacent facial structures).

A proforma was employed for data collection. The sociodemographic profile of the patients, cause of defect, site of defect, flap orientation, complications encountered and outcome in terms of success or otherwise, colour match, contour match, donor site morbidity, functional outcome were all recorded. The data were subjected to statistical analysis.

Statistical analysis: The data were analyzed through SPSS for Windows version 10. The nominal variables were reported as frequency and percentages. The numerical data was reported as Mean±S.D. Nominal variables were analyzed using chi square test.

Results

Out of the 49 patients, 30(61.22%) were males and 19(38.77) were females. The patients ranged in age between 17-61 years with mean age of 41.83 ± 9.71 years. The causes of defects included tumour ablation (83.63%, n=41), burn injury (8.18%, n= 4), road traffic accidents (6.12%, n=3), and infection (2.04%, n= 1).

Area wise the defects were on nose (n=19, 38.77 %), lips (n=13, 26.53 %), cheeks (n=12, 24.48%), and intraoral locations (n=5, 10.20 %). (Table I)

Regarding flap Orientation, it was based superiorly in 41(83.67%) patients while inferiorly based in the remainder 8 (16.32%). The flap was islanded in only 13 (26.53%) patients while in the remainder a skin pedicle was left intact which was subsequently divided in 5(16.32%) patients and the rest of the flaps were inset into the defect primarily.

Table I: Regional distribution of the defects. (n=49)

S No.	Area of defect	No. of Patients/ Percentage
	Nasal Defects	
1	Side wall	9(18.36%)
2	Ala	3(6.12%)
3	Columella	3(6.12%)
4	Tip	2(4.08%)
5	Sill	2(4.08%)
	Lip Defects	
6	Upper lip	11(22.44%)
7	Lower lip	2(4.08%)
8	**Cheek defects**	12(24.48%)
9	**intra-oral defects**	5(10.20%)

All flaps survived completely. The colour match was good in all cases. The contour match was good in patients with nasal dorsum, lip and medial cheek defects while the patients with nasal tip and columella reconstructions needed further debulking procedures to get a contour match with the surrounding nasal tissue. It was non hairy in the upper part and hence an advantage when used intraorally. When the cutaneous part of the lower lip was reconstructed, the flap was extended to include the hairy portion of the cheek which gave a good hair match in male patients. The donor site morbidity was negligible, scar was in the nasolabial crease, healed well in all patients, and was not noticeable especially in elderly patients. There was no functional loss at the donor site. No distortion of adjacent facial structures such as the eye or lips was seen in any patient.

The patients operated for facial defects were discharged the next day. The patients who had intra oral tumor resection were kept in the hospital for 3-4 days until good healing was ensured and any orocutaneous fistula ruled out.

There was no mortality in this case series.

Figure I through V show representative photographs of the included patients.

Figure I: Fifty one years old male with squamous cell carcinoma on nasal side wall.

Figure II: Postoperative photograph after tumour excision and flap coverage, of the same patient as in Figure I.

Figure III: Fifty five years old lady with squamous cell carcinoma on upper lip

Figure IV: Postoperative photograph after tumour excision and flap coverage, of the same patient as in Figure III.

Figure V: Forty six years old lady where nasolapial flap was employed for intra-oral defect.

Discussion

In our study majority of the facial defects were the result of tumour ablation. The share of various cutaneous malignancies was 83.63%. Majority of our patients were in their fourth and fifth decades of life. Our findings conform to those of other published studies. [6]

In majority of our patients a skin pedicle was left intact and the flap was islanded in only 13 (26.53%) patients. Where pedicled flap was employed, the flaps were inset into the defect primarily without dividing the pedicle in most of the cases. Location of the defect and the requirement of rotation or advancement of appropriate tissues to the defect determine the orientation of the pedicle. The flap thickness is also decided according to the needs of the defect. The flap can be as thin as just deep to the sub dermal plexus, and as thick as superficial to the facial musculature.[7] Although the extent of the flap is limited by the available redundant tissue, primary closure of the donor site upto 5 cm is possible with wide undermining of the surrounding cheek tissue.[7,8] In case of pedicled nasolabial flap the flap can be divided after 10-21 days and the remaining flap can be returned into the cheek. Some times debulking of the flap may be required, especially in patients with much fatty tissues in their face.[9]

Most of the patients in our study (84%) underwent superiorly based nasolabial flap. The superiorly based nasolabial flap has been reported to show good results particularly for nasal reconstruction.[9]

In our study we employed nasolabial flaps in 19 patients with various nasal defects. The nasolabial flap has been extensively utilized for nasal reconstruction in many ways. It has also been used as an island flap based on the lateral nasal artery for nasal reconstruction.[10,11] The flap has also been based on the infraorbital arteries to cover the nasal defects.[12] In nasal reconstruction one of the goals is to give good lining and nasolabial flap is also used for this purpose with other flaps.[13-14] Challenging collumellar and alar defects have also been successfully reconstructed with nasolabial flap.[15]

In our study we employed nasolabial flaps in 13 patients with various lip defects. Reconstruction of small and medium defects of the lip with the inferiorly based nasolabial flap has produced good functional and aesthetic results.[16] Another study reports reconstruction of the entire upper lip and columella with a modified bilateral nasolabial flap.[17]

Small defects in the floor of the mouth have been effectively reconstructed with tunneled, inferiorly based nasolabial flap.[2] Our patients with intra oral nasolabial flap reconstruction have shown good contour and bulk match. Senile drooling caused by downward angulation is a problem in elderly which cause troublesome chelitis; this problem is effectively addressed with nasolabial sling based on superiorly based nasolabial flaps tunneled through the lower lip with division of the depressor anguli oris on both sides. [14-17]

Good contour and colour match was observed in all our patients. We had not observed any major complication or any significant donor sit morbidity.

Our study has some limitations. It is a single center study. It was an observational study, randomization and blinding of the patients or treating doctors was not possible and so observer bias could not be eliminated completely. We also could not evaluate cosmetic or long term functional results of the flap. Our study should prompt other similar local studies and hence allow more meaningful comparison of results in our own population. We recommend the conduct of a multicentre local study to confirm and improve upon our results.

Conclusion

The nasolabial flap is a versatile local flap that can be employed to resurface a variety of facial defects resulting from tumour ablation, trauma, burn injury or

infection. It has favorable outcome in terms of survival, colour and contour match, donor site healing and overall functional outcome. Hence it can be considered as the workhorse flap for reconstructing moderate facial defects.

References

1. El-Marakby HH. The Versatile Naso-Labial Flaps in Facial Reconstruction: Journal of the Egyptian Nat Can Inst. 2005;17:245-50.
2. Ikeda C, Katakura A, Yamamoto N, Kmiyama I, Shibahara T, Onoda N, et al. Nasolabial reconstruction of floor of mouth. Bull Tokyo Dent Coll. 2007;48:187-92.
3. Schmidt BL, Dierks EJ. The nasolabial flap. Oral & Maxillofacial Surgery Clinics of North America. 2003;15(4):487-495.
4. D'Arpa S, Cordova A, Pirrello R, Moschella F. One-stage econstruction of the nasal ala: the free-style nasolabial perforator flap. Plast econstr Surg. 2009 Feb;123(2):65e-66e.
5. Borle RM, Nimonkar PV, Rajan R: Extended nasolabial flaps in the management of oral submucous fibrosis. The British journal of Oral & Maxillofacial Surgery. 2009;47(5):382-385.
6. Varghese BT, Sebastian P, Cherian T, Mohan PM, Ahmed I, Koshy C, et al. Nasolabial flaps in oral reconstruction: an analysis of 224 cases. Br J Plast Surg. 2001;54:499.
7. Kaluzinski E, Crasson F, Alix T, Labbe D. Nasolabial flap reconstruction of the collumella. Rev Stomatol Chir Maxillofac. 2004;105:171.
8. Paletta CE, Paletta FX. Nasolabial skin flap to the lower eye lid. Grabb's Encyclopedia of flaps, 2nd ed. B. Straunch, L.O. Vanconez and E.J. Hall-Findlay. Eds. Lippincott-Raven. Philadelphia. 1998;84
9. Rohrich RJ, Conrad MH. The superiorly based nasolabial flap for simultaneous alar and cheek reconstruction. Plat Reconstr Surg. 2001;108:1727.
10. Shao Y, Zhang D, Zhao Z, Jin H, Rong L: Reconstruction of large nasal defects with lateral nasal artery pedicled nasolabial flap. Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi. 2010 May;24(5):552-5.
11. Liang CY, Zhao HW, Wang LJ, Li LJ. Reconstruction of penetrated nasal defects with nasolabial skin flap pedicled on the infraorbital vessels. J Craniofac Surg. 2010 Jan ;21(1):68-70.
12. Li YP, Jiang H, Gu B, Shen GX, Li QF. Repair of nasal lining in nasal reconstruction. Zhonghua Zheng Xing Wai Ke Za Zhi. 2007 Nov;23(6):483-6.
13. Lorenz KJ, Maier H. One-stage reconstruction of the entire upper lip and the columella with a modified bilateral nasolabial flap. Eur Arch Otorhinolaryngol. 2010 Jun;267(6):973-6. Epub 2009 Sep 22.
14. Tei TM, Larsen J. Use of the subcutaneously based nasolabial flap in lower eye lid reconstruction. Br J Plast Surg. 2003;56:420.
15. Thornton JF, Weathers WM. Nasolabial flap for nasal tip reconstruction. Plast Reconstr Surg. 2008 Sep;122(3):775-81.
16. Anisha Maria, Yogesh Sharma, Preeti Kaur. Use of Nasolabial Flap in the Management of Oral Submucous Fibrosis – A Clinical Study. People's J Scientific Research. 2011 Jan;4(1):28-30.
17. Pacifico MD, Ritz M . Correction of senile drooling using the nasolabial sling. J Plast Reconstr Aesthet Surg. 2010 May;63(5):757-62.