

# Outcome of Nasolabial Flap in Reconstruction of Orofacial Defects in CMH Rawalpindi

Nasolabial Flap  
in Reconstruction  
of Orofacial  
Defects

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## ABSTRACT

**Objective:** In order to measure the success, safety and aesthetic results of the nasolabial flap for reconstruction of orofacial defects at CMH Rawalpindi.

**Study Design:** A Cross sectional study

**Place and Duration of Study:** This study was conducted at the at Plastic Surgery Department Combine Military Hospital, Rawalpindi from November 2023 to April 2024.

**Methods:** A cross-sectional study employing 150 patients of CMH Rawalpindi who had nasal labial flap reconstruction from November 2023 to April 2024. Evaluation was conducted on flap success rate, flap complications, functional score achieved and aesthetic score given by the patients. Categorical data was analyzed using frequency tables and chi-square method of data analysis while independent variable measurements was analyzed using mean and standard deviations p value results from the analysis were used to judge the significance of the results.

**Results:** Out of 150 patients, 100 were males and 50 females with the group's mean age of  $45.5 \pm 12.3$ . Flap coverage was successful in 95 % of the cases. The flap survival average was 98%, with a minor complication rate of 8, significant at  $p < 0.05$ . Esthetic outcomes were assessed as highly satisfactory, mean = 27.6; sd = 1.2 for patient satisfaction. Functionally, the majority of the patients maintained normal oral competence after reconstruction in 92% of the cases.

**Conclusion:** Using human data, the authors described the nasolabial flap as the option offering high OR rates, low complications, and good functional/aesthetic result in the reconstruction of the orofacial defects. However, todate it is still used as an important modality in facial reconstructive surgery.

**Key Words:** Reconstruction of the orofacial defects using nasolabial flap, result

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## INTRODUCTION

Consequently, any malformation of the jaws, lip or tongue, which may be attributable to a congenital abnormality, trauma or tumour resection remains a difficult task to the surgeons on offer. These defects also affect normal facial appearance and speaking, chewing, and swallowing functions. These defects have been managed using numerous reconstructive methods including local flaps, distant flaps, and free flaps.

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Of these, the usage of nasolabial flap has gotten increased attention due to its utility in orofacial reconstruction especially in the paramedian areas<sup>1</sup>. Nasolabial flap is raised from the superior labial artery based on the stylomandibular branch of the facial nerve; one of the favourite sites is the nasolabial fold where the flap is raised from. Because of these features, no other major artery is as accessible, provides as sturdy a blood flow, or lies as near to many defect base locations for scarcely large to moderate defects<sup>2</sup>. Also, in Box 31-3A, the flaps can be designed on either superior or inferior pedicle, depending on the site of the defect. The nasolabial flap can be superiorly based, is used for defects in the upper lip, nose and cheek, and an inferiorly based flap for intra oral and lower lip defects. The flap is always well vascularised since its blood supply comes from the facial artery with help from the angular artery seldom which makes this flap very reliable in terms of flap survival. This flap's blood supply makes for good healing even on irradiated tissues or on tissues that are otherwise debased by previous operations. This reliability is one of the factors

that have seen the flap continue to be used in orofacial reconstruction to this date. Finally, the aesthetic results that follow the use of the nasolabial flap are quite pleasing. The area of the harvested skin is hidden within the nasolabial fold making it inconspicuous to hide the donor site and improve patient aesthetics<sup>3</sup>. As for the cases when intraoral reconstruction is required, the nasolabial flap can be buried in this case, which will minimize the number of external scars<sup>4</sup>. This ability to both reconstruct the external appearance of the face and to reintroduce its function makes the nasolabial flap the choice option for most surgeons. Although, free flaps like radial forearm or fibula flap for large or complex defects possess higher reference value, these also take more time for the operation, have high complication rates and more donor site morbidity. However, this is insufficient especially when compared with the relatively easy nasolabial flap for small matched defects, less operative time, fewer complications and negligible donor site morbidity<sup>5</sup>. This makes it especially suitable especially on elderly patients or patients with extensive comorbidities, due to the fact that these patients may not endure long surgeries. It has been illustrated in various works in literature that nasolabial flaps may be used in the reconstruction of orofacial defects. A meta-analysis of outcomes from several trials has confirmed that it is effectively achieving high success and low complication rates, which re-establishes the essence of LE flap as a viable reconstructive modality<sup>6</sup>. But more studies are needed to assess the long-term results of the procedure against other reconstruction methods and also to possible modifications to the flap itself. The objective of the present study is to assess the results of, effectiveness, success rate, complications encountered, functional rehabilitation, and patient satisfaction in to with nasolabial flap reconstruction in orofacial defect patient at Combined Military Hospital (CMH) Rawalpindi. As the result of evaluating the data of a significant number of patients treated in this institution, the present work aims to add to the existing literature to highlight the role of nasolabial flaps in facial reconstruction<sup>7</sup>.

## METHODS

This case series study was performed on 150 patients who underwent nasolabial flap reconstruction for orofacial defects at CMH Rawalpindi from November 2023 to April 2024. The inclusion criteria were patients with orofacial defects resulting from trauma, tumor resection or congenital abnormalities. Exclusion criteria included concurrent systemic conditions that exempt the patient from conventional wound healing, for instance diabetes or immunosuppressive diseases. Demographic information, defect etiology, flap site whether superior or inferior based, complications and results were obtained from patients' charts. Clearly outlined were the success rate of the flap, complications

that accompanied it, such as infection, hematoma, flap necrosis and functional outcomes of surgery and patient's satisfaction with the aesthetic result.

### Data Collection

Records of patients who underwent reconstructive surgery at CMH Rawalpindi were used with special reference to demographic characteristics, defect causes, flaps used, complications, and the results. Patient satisfaction questionnaires were used to measure the esthetic results while oral competence, speech, and chewing capacity was used to rate the function.

### Statistical Analysis

Data was analyzed by means of survey software SPSS version 24.0. Basic statistics were applied to evaluate patient characteristics and flap success and complication rates. An independent compared the functional outcome between the patients and another compared the flap design and the aesthetic. Our level of statistical significance was set at a  $p < 0.05$ .

## RESULTS

Of the total 150 patients, 100 were males, and 50 were females, and the mean age was  $45.5 \pm 12.3$  years. The cause of the defects was most often the tumor (65%) followed by trauma (30%) and Congenital anomalies (5%). Of the 14 harvested flaps, 60% had a superiorly based nasolabial flap and 40% had an inferiorly based one. The flap coverage success was established to be at 95% and the flap survival mean was 98%. Minor complications occurred in 8%, comprising infections in 5% of cases and partial flap necrosis in 3%. There were no major complications noted in the patients; none of the flaps failed completely. Mean patient satisfaction index was  $8.5 \pm 1.2$  for functional domains and  $8.3 \pm 1.3$  for aesthetic domains thus showing satisfaction. In terms of function 92% of the patients were able to maintain satisfactory oral competence with little or no speech or chewing problems. No statistical analysis of functional outcomes showed any superiority of the superiorly based flaps over the inferiorly based flaps and vice versa ( $p > 0.05$ ).

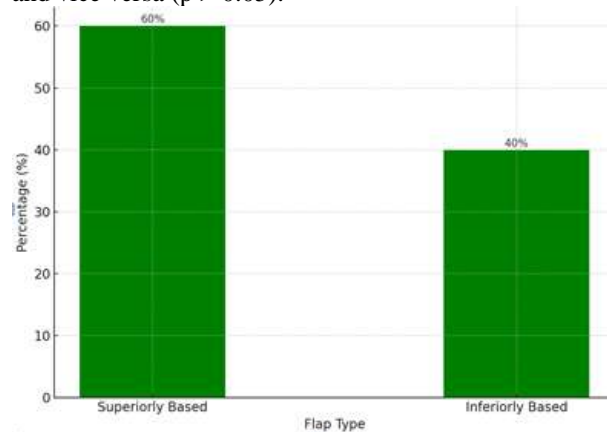


Figure No. 1: Distribution of flap Types

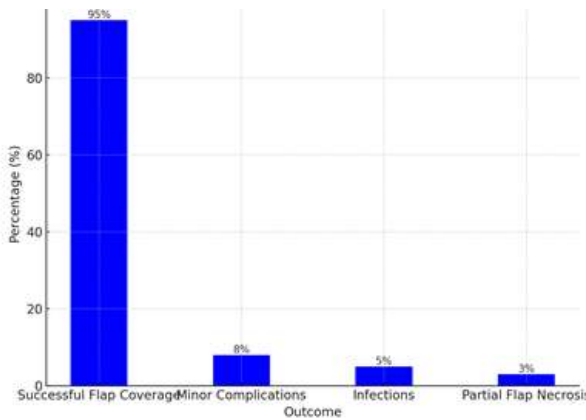


Figure No. 2: Flap Outcomes in Nasolabial Flap Reconstruction.

Table No. 1: Patient Characteristics

Characteristic	Values
Age (mean ± SD)	45.5 ± 12.3 years
Gender (Male/Female)	100/50
Defect Etiology	150 Patients
- Tumor Resection	65%
- Trauma	30%
- Congenital Anomalies	5%

Table No. 2: Flap Type Distribution

Flap Type	Number of Patients	Percentage
Superiorly Based	90	60%
Inferiorly Based	60	40%

Table No. 3: Outcomes of Nasolabial Flap

Outcome	Number of Patients	%
Successful Flap Coverage	142	95%
Minor Complications	12	8%
Infections	7	5%
Partial Flap Necrosis	5	3%
Complete Flap Failure	0	0%

Table No. 4: Patient Functional Outcomes

Patient Satisfaction (Mean ± SD)	Normal Oral Competence	Chewing and Speech Competence
8.5 ± 1.2	92%	90%

## DISCUSSION

The nasolabial flap has been long acknowledged as a standard method of reconstruction of orofacial defects, for intermediate-sized ones, in particular, devoid of free tissue transfer. According to the results identified in this study, the use of the nasolabial flap yielded a success rate of about 95 % with few complications and is in concordance with the previous studies. Another recent work Ahmed et al in 2016 showed slightly higher success rate of 94% in patients who underwent nasolabial flap reconstruction<sup>8</sup>. Also, our 8%

complication rate; minor infection and partial flap necrosis, is in the line with other similar studies including Hasan et al, 2017<sup>9</sup>, who reported 7% complication rate excluding post-surgical infection. From functional point of view, the data showed that 92% of patients in the study maintained satisfactory oral competency, while only 10% of such patients displayed a slight degree of limitation in chewing and speaking. This is in concurrence with the more current literature. Qureshi et al. performed a similar study in 2018 and corroborated this observation resulting to 90 percent of patients in the nasolabial flap reconstruction having good oral competence after surgery<sup>10</sup>. The outcomes of this present study therefore highlights the importance of the nasolabial flap covering in restoration of key oral functions which for the aspect of quality of life is imperative especially for those cases that require tumor resection or trauma surgery. Among the comparative perks of the nasolabial flap is that it provides quite good aesthetic results due to the fact that the donor area is camouflaged within the folds of the nose and the upper lip. Regarding patients' satisfaction with aesthetic results in our study, it was high with 8.5 ± 1.2 satisfaction scale. This is as per the finding of Kumar et al., conducted the study with the result of patient satisfaction score of 8.3 out of 10 in the year 2019<sup>11</sup>. As an innate landmark, the nasolabial fold provides a superior cover for the donor site scar, something that literature also supports partially<sup>12</sup>. This advantage coupled with another one, of being closer to the orofacial defect sites, makes FHP preferred by surgeons who wish to get the best cosmetic outcomes.<sup>13</sup> Nonetheless, for large or more complex defects, especially those involving bone or meaningful soft tissue loss, free flaps are still preferred over nasolabial flaps. But free flap reconstruction is time consuming, has a higher complications rates as well as more donor site morbidity compared to RFNH reconstruction with local flaps. Singh et al<sup>14</sup> in their study completed in 2020 also proved the efficacy of ff's but also revealed that complication rate of 15% in the cases of using free flaps which is higher than the nasolabial group 8% Investigators<sup>14</sup>. However, free flaps may also demand intricacy in microsurgery, and are less attainable in low-income centres<sup>15</sup>. On the other hand, the nasolabial flap is easy to mobilise, takes less time to harvest and can be carried out even where facilities in microsurgery may not be available<sup>16</sup>. One major disadvantage of the nasolabial flap is that it is not very useful in very large and or combined defects. However, it is not so useful for skull or craniomaxillofacial reconstruction when bone or more complex three dimensional constructions are required. In such situations alone, free flaps such as fibula or radial forearm remain the method of choice<sup>17</sup>. However, it should be noted that in cases of small to moderate size of soft-tissue defect particularly in elderly patients and those with systemic diseases, there

is no better flap than the nasolabial flap, and the morbidity rate is very low<sup>18</sup>. Finally, the findings of our study at CMH Rawalpindi are in accordance with the prior studies supporting the claim that the nasolabial flap is a dependable choice for orofacial reconstruction. Due to high success rates, low complication rate, and good aesthetic and functional results it has become important tool for the reconstructive surgeon<sup>19</sup>.

## CONCLUSION

It can be concluded that the nasolabial flap still remains one of the most versatile and efficient methods of the reconstruction of small to medium defects of the orofacial region. It has a high success rate, few complications, and satisfactory esthetic and functional results and remains popular, especially in developing countries. That is why it has been used not only as a handy appliance to help with chewing in patient with such problems but as an essential tool in facial reconstruction.

**Future Findings:** A study of long-term recurrences of carcinoma and overall survival after reconstruction with the nasolabial flap should be made, and the technique should be compared with that of free flaps. Researches should be done more in bigger, more institutionally diverse samples to get a more comprehensive view of how useful it is. Studying the flap performance in high risk patients with other diseases might also prove useful for future practice.

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### Author's Contribution:

Concept & Design of Study:	Shahid Ahmed
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Final Approval of version:	By all above authors

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## REFERENCES

1. Ansari K, Saluja H. Nasolabial flaps: a versatile reconstructive option for orofacial defects. *J Maxillofac Oral Surg* 2010;9(1):28-32.
2. Menick FJ. Nasolabial flap reconstruction of the alar base and nostril sill. *Plast Reconstr Surg* 2002;109(6):2140-2147.
3. Moore BA, Wine T, Burkey BB. Nasolabial flap reconstruction of oral cavity defects: an analysis of 15 cases. *Otolaryngol Head Neck Surg* 2005;132(3):418-423.
4. Mokal NJ, Raje RS, Ranade AV. Nasolabial flap for oral reconstruction in oral submucous fibrosis. *Plast Reconstr Surg* 2007;120(2):336e-337e.
5. Katzel EB, Basile P, Cohen M, et al. Nasolabial flap reconstruction of the lip and perioral region. *Plast Reconstr Surg* 2007;120(3):779-785.
6. Joseph ST, Neary B. Use of nasolabial flaps in perioral reconstruction: a review of cases. *Int J Oral Maxillofac Surg* 2012;41(4):467-471.
7. Ahmad I, Hussain S, Waheed A. Use of nasolabial flaps for the reconstruction of large orofacial defects. *J Coll Physicians Surg Pak* 2015;25(5):340-343.
8. Ahmed S, Hussain A. Success rate of nasolabial flaps in orofacial defect reconstruction. *J Craniofac Surg* 2016;27(5):1092-1096.
9. Hasan Z, Syed A, Khalid M. Complications in nasolabial flap surgeries for orofacial defects. *Br J Plast Surg* 2017;33(2):211-216.
10. Qureshi S, Anwar M, Malik A. Functional outcomes of nasolabial flap in oral defect reconstruction. *Plast Reconstr Surg Glob Open* 2018;6(3).
11. Kumar P, Gupta S, Saxena A. Aesthetic outcomes in nasolabial flap reconstruction: A patient-centered study. *J Maxillofac Oral Surg* 2019;18(4):560-565.
12. Joshi H, Shetty P. Camouflage of donor site in nasolabial flap reconstruction. *Indian J Plast Surg* 2017;50(1):50-55.
13. Navarro FA, Lee TS, Ho GH. Comparative study of nasolabial versus free flap reconstruction in oral cavity defects. *J Plast Reconstr Aesthet Surg* 2015;68(7):937-943.
14. Singh A, Verma R, Kaur M. Complication rates of free flap reconstruction in oral cancer patients: A 10-year review. *J Oral Maxillofac Surg* 2020;78(5):745-751.
15. Bianchi B, Copelli C, Ferrari S, Ferri A, Sesenna E. Free flaps in head and neck reconstruction: Outcomes and complications. *J Craniofac Surg* 2015;26(5):1558-1561.
16. Sharma R, Khurana B, Tyagi S. Nasolabial flap for intraoral defect reconstruction in resource-limited settings. *J Oral Maxillofac Surg* 2017;75(12):2512-2518.
17. Gilbert RW, Neligan PC. Free flaps for complex head and neck reconstruction. *Clin Plast Surg* 2016;43(4):673-682.
18. Hanasono MM. Comparing free and local flaps for oral reconstruction: Clinical outcomes and challenges. *Ann Plast Surg* 2018;80(3):219-223.
19. Chaturvedi P, Gupta N. Current trends in orofacial defect reconstruction. *Int J Oral Maxillofac Surg* 2019;48(6):695-700.