



NASAL RECONSTRUCTION: AN OVERVIEW OF VARIOUS MODALITIES FOR NASAL RECONSTRUCTION

Plastic Surgery

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ABSTRACT

Nose is one of the most important Aesthetic unit of face and part of personality of a person. Any defect or lesion over nose need to be addressed. The incidence of nasal defect in the population is not rare. Principle of "like to be replaced by like" provide very less option of donor area for nasal reconstruction. One should keep in mind certain limitation of nasal reconstruction before operating so donor site to be used judiciously. We should keep in mind regarding aesthetics sub unit of nose and nasal anatomy.

Late scar healing is also considerable. The major aspect the author believe to discuss are about lining, support, skin coverage, local nasal flap. The role of patient education, counselling, regarding multistage procedure and post-operative care can't be neglected.

Author discussed here experiences with dealing nasal defects and progressive improvements in applying various principles of aesthetic reconstruction.

KEYWORDS

Nasal defect, Reconstruction, Aesthetic subunit, Patient counselling, Scar

INTRODUCTION-

Facial Reconstruction is a challenge to plastic surgeon. In view of history of plastic surgery is considered to begin in India around 600 BC with cheek flap by Shushruta for reconstruction of nose. There are evidence available which shown that technique of forehead flap was basically born in India. Nasal defects are frequently seen after trauma, dog bite, or full thickness lesion over nose leading to defect which requires reconstruction. The surgeon dealing with Nasal defect should keep in mind various aspects of nasal reconstruction which includes proper assessment of defect as well as patient background, delayed scar healing, aesthetic subunits of nose. A compliant patient is easy to explain regarding multiple stages of operation and post-operative care. It is not advisable to consider chronically ill debilitated patient for multi stage procedure. So patient role is also important before implementation of reconstruction.

Surgeon should have knowledge of anatomy of nose and its aesthetic subunit. It helps in assessment of defect preoperatively, define a goal, and formulate an operative plan which increases the chances of survival²

Aesthetic sub unit of nose are defined as topographic regions with lighted ridges and a shadowed valley of nasal surface. There are 4 concave subunits which includes paired side walls, paired soft triangle and 5 convex subunits are Dorsum, tip, columella, Paired ala.⁵ If > 50% of subunits is lost then entire subunit must be replaced.

Adherence to the subunits principle is more important in the lower third subunit tip, ala, columella & soft triangle. Surgeon must consider what the implication are for the patients and surgical stages if strict adherence to subunit principle is advocated. Dermabrasion & alar wedge resection must be considered for further stages of reconstruction.

On the basis of skin thickness, texture Nose Is divided into 3 zones. Zone 1 includes upper dorsum & sidewalls. Zone 2 is 1.5 cm above the supra tip and includes nasal tip and lobules. Zone 3 includes Alar Margins and soft triangle.¹

Reconstruction option for Zone 1 small defect of < 1.5cm size are local flap and preauricular skin graft and for defect > 1.5cm forehead flap should be used.¹

Reconstruction option for Zone 2 small defect of < 1.5cm size are

bilobed flap and full thickness forehead skin graft and for defect > 1.5cm paramedian forehead flap should be used.¹

Reconstruction option for Zone 3 small defect of < 1.5cm size are composite graft from ear pre auricular skin graft and for defect > 1.5cm nasolabial flap should be used.¹

"Lining an entire nose anterior to the maxilla requires a piece of skin approximately 8 x 9 cm. Skin graft used as a lining often contacts therefore thin soft flap are a better choices"¹

Nasolabial flaps are frequently used for inner lining but the drawback is it is thick and not highly vascular. It is difficult to watch for flap survival. Other option for lining flaps includes turn over flaps, bipedicle lining flap, contralateral septal flap, ipsilateral septal flap, FTSG backed by cartilage.

"Taking extra tissue for 'good measures' or out of fear for vascularity, only complicates the repair. If too much is harvested, the donor burden is unnecessarily increased"

Complex nasal defects in which central supportive structure of the nose is lost, the anterior part of septum must be reconstructed first for replacement of entire scaffolding, rib cartilage will be needed. L shaped central scaffolding should be constructed out of rib cartilage.



Early Complications encountered in forms infection, venous congestion and partial necrosis of flap usually get settled because of rich vascular supply of face. The important thing is long term complication in view of alar distortion, trap door scar, ectropion and deviation of eyebrow and lower eyelid. These are the results of poor planning of defect assessment and coverage. The donor site complication includes the infection, suture line dehiscence and unacceptable scar. So donor site laxity of tissue and involvement of area in primary trauma should be considered.

Case illustration 1

A 39 year old male presented to our department 6 months after trauma with left side nasal alar defect. Our planning was to provide inner lining with a nasolabial flap and external coverage with contra lateral forehead flap. As the defect was large and distant so we has to extend flap beyond hair lining. A choncal cartilage was placed to provide support to alar margin.



Pre-op

intra-op

It was difficult to monitor the inner nasolabial flap survival but ultimately both flap survived. Patient managed further by flap thinning and epilation.



Post-op

Case illustration 2

A 65 year male patient presented to us with benign lesion over right side nose. Patient was planned for excision and coverage of defect. Intra operatively the lesion was not involving the inner lining of nasal cartilage. The defect was 2.2 cm x 2 cm in size and involving zone 1 and 2 both. It is considered to be covered by nasolabial flap primarily but as per intra op assessment we planned for flip flap coverage of the defect and after back cut it covered the defect properly. Post operatively the flap settled well and grossly no distortion of aesthetic appearance.



Case illustration 3:

A 69 year old male patient with known case of basal cell carcinoma came to us for excision of recurrent lesion. Patient was managed with primary excision and suturing outside. Biopsy reports was in favour basal cell carcinoma at the tip of nose. We planned for excision of the primary lesion with appropriate margin as it was >50% excision of the subunit so we removed the entire subunit and planned for reconstruction. Initial planning was covering the defect with forehead flap but due to laxity of skin and intraoperative assessment we shifted to coverage by local flap method. For this we has to go beyond the midline also. It provided not only satisfactory end results but also patient was discharged after single stage surgery.



Case illustration 4

This 30-year-old man had a post trauma nasal defect on right side. The Patient undergone split thickness skin grafting at the time of trauma and came for follow up after 6 months for nasal reconstruction. We planned for turnover of scar tissue and supported by Conchal cartilage graft. Then a narrow inferiorly based thin nasolabial flap raised to provide coverage.



(Pre-op)

(intra-op)



The patient came to us after 3 month with quite satisfactory results and decided to plan for flap thinning and alar wedge resection and dermabrasion subsequently but the patient was not willing for any further procedure and was satisfied with the initial results so we lost follow up of this patient.

Case illustration 5:

The patient was 52 year-old woman with history of dog bite over face 6 month back. Patient had a lacerated wound over check and nose which was primarily sutured outside. Patient came to us for correction of nasal defect. It was difficult to provide inner lining as the area of nasolabial flap territory was involved. Another options we had was to put a full thickness or split thickness graft or a muco-periosteal flap or bi-pedical lining flap. We planned to provide coverage with forehead flap and a split thickness graft kept under it to provide lining.



Pre-op

Intra-op



Post-op

Case illustration 6:

A young patient of 22 year age with inappropriate primary suturing came to us. We planned for revision suturing but it was not suppose to work. So we planned to put a chonchal cartilage graft to provide proper scaffolding. It not only correct the primary defect but also helps in maintaining the opening of anterior nares.

**Pre op****Intra op****DISCUSSION:**

Nasal reconstruction is multimodal approach which required surgeon's role as well as patient role. It is combination of defect coverage and cosmetic aspect of the scar. Inner lining formation is very crucial step. If inner lining is formed well we can provide proper external coverage and then after proper cosmetic results should be considered. For cosmesis we have various other options like flap thinning, dermabrasion and laser. It is very important to assess the patient and his proper counselling should be done because we cannot promise all the issues in single sitting. Assessment of the defect should be proper in view of all the available option. What we have experienced is that initially our approach was defect only but gradually proceed to defect as well as cosmetic approach also.

Lifei Guo et al in their study insisted to use various local flaps for small defects of nasal units Like Glabella flap, Miter flap⁶, V-Y advancement flap for small defects of nasal units.⁶ These local flaps provides good cosmetic results as well as no distortion of subunits.

Aksam et al have mentioned in their study that planning a subcutaneous pedicled nasolabial flap will produce more chances of trap door scar.¹ so planning should be done as per laxity of donor area which is variable in every patient. It is much easier to close a donor area in elderly who have quite lax skin as compare to younger individual. Tight closure of the donor area will not only affect flap survival in a subcutaneous pedicled nasolabial flap but also will increase the chances of trap door scar and donor defect

Menick has described that folding of forehead flap for lining the defect is reliable and efficient in lining the defect. It is recommended to repair defect size up to 3.5 cm size.⁴ in smokers we should not go up to that extent as higher chances of tip necrosis.

We didn't evaluated patients in view of post operative scar which should be major concerns. But scar can be managed in various other ways like LASER and dermabrasion. We also encountered the same complications which are common for all flaps but didn't get any devastating complication. It is mainly because of rich vascularity of facial framework.

MATERIAL AND METHODS:

From August 2015 to September 2019 patients were included. We operated 43 patients of nasal defect in between this period. These included the defect caused by trauma and lesions over nose. The patients who are primarily managed at some other centre with unsatisfactory results were also included. The patient with benign lesion which was treated without causing any significant defect were not included. Various techniques in nasal reconstruction discussed here

and our learning with experience provides better cosmesis. Patient education and counselling helped in post-operative care as well as in understanding of multistage procedure. Initially we used to provide inner lining in first stage and in second stage we focused over filling the defect and then after regarding the cosmetic outcome. But later on we started providing innerlining support and defect filling in same stage with consideration of cosmetic outcomes. Complication and Inadequate results in view of cosmetic outcomes are encountered and discussed.

CONCLUSION:

What we have learnt through our experience that nasal reconstruction is not a defect only approach. We should address the cosmetic aspect also. Anyone who is planning nasal reconstruction should consider two main factors.

One is patient factor which includes Age, size of the defect, inner lining, laxity of skin surrounding scar and donor area, comorbid conditions.

Other factor is surgeons' factor which includes proper planning in view of no distortion of subunit, long term evaluation of scar, proper scaffolding. No doubt forehead flap is best in coverage of nasal defect but we can not neglect the local flaps. Sometimes we can cover the whole subunit by local flap. Local flaps provide single stage coverage which is beneficial for patient also. You should not plan multistage procedure in patients who are debilitated and not educated well. With proper planning in nasal reconstruction we can proceed from defect only approach to aesthetic consideration.

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