

Original Research Article**Title: “VERSATILE FLAP RECONSTRUCTION FOR BASAL CELL CARCINOMA OF NOSE”****Dr. Nidhi Roy¹, Dr. Urvashi Singh², Dr. Ajay Sharma³, Dr. Shivangi Pandey^{4*},****Dr. Arun Bhatnagar⁵**^{1,2,3,4}Department of General Surgery, Gandhi Medical College, Bhopal, Madhya Pradesh, INDIA⁵Professor and Head, Department of Burns & Plastic, Gandhi Medical College, Bhopal, Madhya Pradesh, INDIA.***Corresponding Author:****Dr. Shivangi Pandey**

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ABSTRACT

Background: Basal cell carcinoma is the most common form of skin cancer and most frequently occurring form of all cancers. It looks like growth with slightly elevated rolled edges or central indentation. Lesions commonly arise in sun-exposed areas.

Methods: We observed 10 patients who presented with nasal mass with long-standing history. Nasal defects that are too large to repair with other local flaps or full-thickness or composite grafts and defect wider than 2 cm in the horizontal plane or those with exposed and denuded bone and/or cartilage are taken into consideration. Forehead flap reconstruction was done with lesser morbidity. Follow-up was done till 6 months after flap detachment and inset and results were assessed.

Results: All patients underwent forehead flap reconstruction with good aesthetic outcome and lesser morbidity. The flap was viable in all patients with no recurrences. Cosmetic and functional outcomes were good. However, few patients developed minor complications like post-operative trismus, severe wound contracture, ectropion and infection and wound dehiscence.

Conclusions: Large defect over nose can be covered with forehead flap with good aesthetic outcomes. It gives ideal quality of color and texture, reduced morbidity and maintained viability, greater versatility in movement and length.

KEYWORDS – Basal cell carcinoma, flap reconstruction, forehead flap, nasal defect

INTRODUCTION:

Basal cell carcinoma is the most common, slow-growing epidermal skin cancer. About 80% of all Basal cell carcinoma occur on the face, of these tumours 25% to 30% are found on the nose. The most significant etiological factors of basal cell carcinoma appear to be genetic predisposition and exposure to sun (ultraviolet radiation).[1,2,3] Basal cell carcinoma rarely causes metastasis. However, a small portion of this pathology acts more aggressive, with a probability to infiltrate deep tissues and bones. Moreover, incomplete excision of Basal cell carcinoma can cause its recurrence.[4,5] There are many treatment methods for Basal cell carcinoma, ranging from Non surgical like topical therapy (e.g. imiquimod) and minimally invasive procedures (e.g. photodynamic therapy) and cryosurgery as well as Reconstructive surgical excision and therapies. The treatment is chosen considering relative risk of recurrence, location, tumour size and individual patient comorbidities.[3,6] CO2 laser ablation is an alternative therapy for treating lesion smaller than 2 cm, superficial and early nodular basal cell carcinomas and usually cosmetic outcomes are good to excellent. Still, to improve treatment ratio and diminish recurrence rate, a combined treatment, contained of CO2 laser and photodynamic therapy (PDT) was suggested. Nevertheless, studies concluded, that single PDT treatment leads to higher recurrence rate, compared to surgical treatment [8]. The forehead flap is a versatile pedicled flap which is based upon supratrochlear artery, that is well suited for reconstruction of complex or large nasal defects. Supposedly, this type of flap may be one of the oldest flaps in use for the reconstruction of facial defects. Given the ideal quality of color and texture, the forehead skin is recognized as the best donor site for resurfacing the nasal defects.[9,10]

Aim and Objectives: In the study we present our experience with utilization of the forehead flaps (PFF) in facial reconstruction. We evaluated the indications, flap designs, technique, and complications.

MATERIAL AND METHODS:

We observed 10 patient who presented with nasal mass with long standing history. A defect wider than 2 cm in the horizontal plane or those with exposed and denuded bone and/or cartilage; Nasal defects that are too large to repair with other local flaps or full-thickness or composite grafts and are taken into consideration. Age is not a contraindication. Forehead flap reconstruction done with lesser morbidity. Follow up was done till 6 months after flap detachment and inset and results were assessed.

Surgical technique –

PRE-OP -

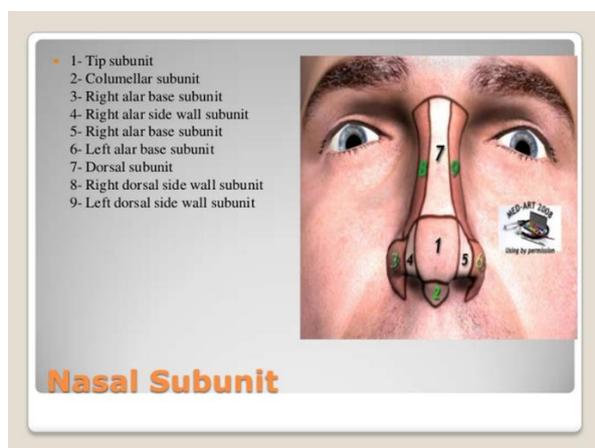
The forehead flap is a 2-stage procedure, and patients should receive preoperative counseling concerning their appearance between the first and second stages of the procedure. Thorough preoperative planning, including assessment of the defect, hairline height, and forehead laxity, is important. Patients should be given wound care instructions, and realistic goals about the final outcome of their nasal reconstruction.

ANESTHESIA -The majority of our patients underwent surgery under general anesthesia. They are then locally anesthetized using 1% lidocaine with a 1:100,000 concentration of epinephrine and usually treated with a broad-spectrum prophylactic antibiotic.

POSITIONING- Placing the patient in the supine position in approximately 20° to 30° of the reverse Trendelenburg position has the advantage of decreasing intraoperative bleeding by preventing venous pooling and flap congestion.

PRINCIPLE- The principle involved is that of resurfacing all of a nasal subunit if the defect includes more than 50% of the surface area of the subunit. The subunit principle is based on the observation that the ridges and valleys of nasal contour create visual patterns of topographical regional units and subunits that reflect the contour of the underlying hard and soft tissues. The outline and definition of each subunit are determined by observing the light and shadow reflected from each individual nose. The subunits are defined by direct visual observation of surface contour, texture, color, and adnexal content and quality. Approximately 9 subunits exist on the nose. **Five are convex:** the tip, dorsum, columella, and paired ala-nostril sills. **Four are concave:** the paired sidewalls and paired soft triangles. Using the subunit principle, the surgeon can select the best donor tissue match with respect to color, texture, thickness, and adnexal qualities. Also, the surgeon can control the size, shape, and position of incision lines and thus determine the location of the scars. By enlarging and/or altering defects to fit topographical subunits, the resulting scars will fall in borders of the subunits. Scars are therefore usually less apparent when the subunit principle is used.

Figure 1



HARVESTING THE FLAP-

The flap can be designed using a Doppler probe to precisely locate the supratrochlear artery as it exits the superior medial orbit. This will allow narrowing of the pedicle to as little as 1.0 cm at the glabella. The pedicle may be designed on the contralateral or ipsilateral side of the primary nasal defect. We routinely use an ipsilateral pedicle, often extending it below the brow, which has the advantage of increased obtainable flap length. Then, the length of the flap is usually determined by measuring from the base of the pedicle to the tip of the flap template at the hairline. While the suture is held at the base of the pedicle, the remaining position is rotated 180° in the coronal plane to the distal recipient site on the nose. If the suture cannot reach this site, the template must be repositioned higher on the forehead or the

pedicle base must be lowered below the level of the eyebrow. The flap is then precisely outlined on the forehead with a surgical marker as close to midline as the pedicle will allow. The right edge of the template must correspond to the left edge of the primary defect. The flap is elevated together with the frontalis muscle along a cleavage plane superficial to the periosteum of the frontal bone. The flap is elevated from superior to inferior, with care being taken as the dissection reaches 1 to 2 cm above the eyebrow. Blunt dissection is then performed to avoid cutting the supratrochlear artery as it exits over the corrugator supercilii muscle. Once the artery has been identified and preserved, blunt dissection and sharp dissection are used to continue the dissection down to the root of the nose to achieve adequate flap length. Once the flap is elevated, it is pivoted 180° on its base. The flap is thinned by removing the distal frontalis muscle and subcutaneous fat to match the precise depth and breadth of the defect. Usually only the distal three fourths of the flap required for reconstruction is contoured at this time. The proximal one fourth is left thick until the pedicle is detached.

DONOR SITE CLOSURE-

For large or tight donor defects, the donor site is closed by extensively undermining the forehead in a submuscular plane to the anterior borders of the temporalis muscle bilaterally. If needed, several parallel vertical galeotomies, 2 to 3 cm apart, are made to the level of the subcutaneous fat. No drain is required. If needed, internal lining is replaced, usually with septal or bipedicle mucosal flaps. If required, skeletal and structural loss is reconstructed with donor cartilage from the ear or septum. The trimmed flap is inset into the primary defect on the nose fashion. The raw undersurface of the exposed pedicle is left open or gently wrapped with petrolatum gauze, with care being taken not to constrict the pedicle.

FOLLOW UP-

On the 5th to 7th postoperative day, the sutures are removed. The patient is scheduled for flap detachment approximately 3 weeks from the date of initial surgery. The pedicle is separated, and enough of the base of the pedicle is returned to the glabellar region to achieve a normal inter eyebrow distance. Excess pedicle should not be returned to the forehead above the level of the eyebrows to enhance the cosmetic outcome. The proximal portion of the inset flap is thinned and contoured to reconstruct the nasal subunit. Deep closure is not necessary, since the wound should be under no tension.

Figure 2



Figure 3: Post Op

**RESULTS:**

10 patients were included in the study, out of which 8 were males and 2 were females. The age of our patients ranged from 25 years to 69 years. The site of the primary tumor was mainly nose, nasolabial fold, cheeks, and forehead. In all the patients the flap was viable. In 8 out of 10 patients, the surgery was carried out in 2 stages where resection of the primary and reconstruction using the PFF was done in the first stage while and flap division was done in the second stage. Supratrochlear artery was dissected and preserved in all the patients. No radiotherapy were given to all patients. The follow-up was done for 6 months, and no patient was lost to follow-up. In 2 patients there was infection and wound dehiscence who required extended antibiotic coverage and repeated dressings and in 1 patient an oro-cutaneous fistula developed in the donor site which needed a secondary minor surgical procedure for closure. Cosmetic and functional outcomes were good in all our patients, however 2/10 patient developed post-operative trismus. Bulky appearance of the flap was noted in 4/10 patients. None of our patients had any recurrence in the flaps used for reconstruction.

DISCUSSION:

Operative treatment of basal cell carcinoma has been regarded as the best option for primary basal cell carcinoma management. In these cases, we reported the use of forehead flap, considered as a first line treatment method which can deliver near-normal functional and cosmetic results. The forehead flap was first circumscribed in 1834. Now it is known as an ultimate reconstructive technique for nasal defects [11]. Unfortunately, there are some contraindications for using this surgical method – advanced age, significant small-vessel disease, history of radiation therapy and medical instability [12]. The forehead flap is based on an axial blood supply from the supratrochlear artery, which exits the orbit 1.7- 2.2cm lateral to the midline at the level of the superior orbital rim. It then travels deep to the orbicularis oculi and superficial to the corrugator supercilii muscle. Later penetrates the orbicularis and frontal muscles at the level of the brow to run in a subcutaneous and subdermal plexus approximately 2 cm from midline or approximately at the level of the medial brow. The flap includes epidermis, dermis, subcutaneous tissue, frontal muscle and associated fascia. The technique of staged interpolation flaps needs greater experience & the

key features are the design of a vascular pedicle based on a nourishing artery, donor location distant from the defect, and at least two stages for completion (pedicle formation and closure, pedicle division, and revision).

The forehead flap (PFF) is used to repair mediodistal nasal defects. The flap design needs a sufficient height of the forehead to create a flap long enough to cover the nasal defect. Dissection of the PFF is below the venter frontalis. The base of the pedicle should be 1 to 1.5 cm. Flaps mobilized down to the galea needs a meticulous haemostasis. Subperiosteal release of the flap increases mobility. Before suturing the thickness of the flap needs to be adapted to the surgical defect.

CONCLUSION:

Large defect over nose can be covered with forehead flap with good aesthetic outcomes. It gives ideal quality of color and texture, reduced morbidity and maintained viability, greater versatility in movement and length .

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