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Case Report

Facial reconstruction following basal cell carcinoma: repair using a paramedian forehead flap - a case report

Orson R. Juan[1]*, Manuel A. Baas[1], Tomiko I. Juan[2], Jonathan C. Barrientos[1], Jose L. Lozano[1], Jesus E. C. Villegas[3]

[1]Department of Surgery, Ignacio Garcia Tellez IMSS, Merida, Yucatan, Mexico
[2]Department of Pediatrics, Centro Medico Nacional de Occidente IMSS, Merida, Yucatan, Mexico
[3]Departament of Intern Medicine, Hospital Mac Leon, Guanajuato, Mexico

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***Correspondence:**
Dr. Orson R. Juan,
E-mail: ors.rzh@gmail.com

ABSTRACT

Basal cell carcinoma (BCC) is the most common malignant cutaneous neoplasm, primarily affecting sun-exposed areas, with the nasal region being one of the most frequently involved sites. Here this report presents the case of a 68-year-old male presenting with an ulcerated lesion on the nasal tip, clinically consistent with nodular ulcerative BCC. A wide local excision was performed, and intraoperative frozen section analysis confirmed tumor-free margins. Reconstruction of the resulting full-thickness nasal defect was accomplished using a two-stage interpolated paramedian forehead flap. The postoperative course was uneventful, yielding an outcome that was both aesthetically satisfactory and functionally robust, with no evidence of recurrence during short-term follow-up. This case highlights the importance of meticulous oncologic resection and tailored reconstructive planning in managing complex nasal defects caused by skin cancer.

Keywords: Basal cell carcinoma, Nasal reconstruction, Paramedian forehead flap, Case report, Full-thickness nasal defect

INTRODUCTION

Basal cell carcinoma (BCC) is the most frequently diagnosed cutaneous malignancy worldwide. Arising from the basal layer of the epidermis, BCC typically exhibits indolent yet locally invasive growth. While its metastatic potential is exceedingly low, the tumor may cause significant local destruction when it affects functionally and cosmetically critical areas—particularly the nose—where prompt and precise intervention is essential to prevent invasion into cartilaginous and deeper structures.[1]

In Mexico, the incidence of BCC has risen in recent years, largely due to cumulative ultraviolet (UV) exposure, demographic aging, and limited access to photoprotective measures, especially in rural populations.[2] The nasal region is particularly susceptible due to its prominent anatomical location, constant UV exposure, and complex three-dimensional architecture. These factors make nasal BCC especially challenging to manage from both oncologic and reconstructive perspectives. Optimal nasal reconstruction following oncologic resection must fulfill three critical principles: restoration of the internal mucosal lining, re-establishment of structural support, and resurfacing with skin that closely matches the native tissue in color, thickness, and texture. Among available techniques, the interpolated paramedian forehead flap remains a cornerstone in nasal reconstruction, offering robust vascular reliability and excellent aesthetic outcomes.

Epidemiology

BCC accounts for approximately 70–80% of non-melanoma skin cancers in Mexico.[3] It is predominantly

diagnosed in individuals over the age of 60, particularly in those with fair skin phototypes and a history of chronic UV exposure. Anatomically, the head and neck region is most affected, comprising nearly 85% of reported cases.[4] Within the facial subunits, the nasal region represents the most frequent site (30–35%), followed by the cheeks, periorbital area, forehead, and auricular pavilion.[5]

From a histopathological perspective, the nodular subtype is the most prevalent on the face, accounting for 60–70% of cases, and is generally associated with lower aggressiveness when excised promptly. However, in embryologically fused areas such as the nasal tip, deeper tissue invasion is more likely. Less common variants include the superficial, pigmented, and infiltrative (morpheaform) subtypes—the latter characterized by ill-defined borders and a significantly higher risk of local recurrence if not completely excised.[6]

While BCC is associated with minimal mortality, its consequences on facial aesthetics and function can be profound—especially when lesions involve visible or anatomically complex areas.[7] Although wide local excision remains curative in the vast majority of cases, the resulting surgical defects often demand advanced reconstructive approaches to restore acceptable cosmetic appearance and functional integrity.[8] Among these, the interpolated paramedian forehead flap stands out as one of the most reliable and versatile techniques, particularly in the management of full-thickness nasal defects.[9]

CASE REPORT

Clinical manifestations

BCC typically presents as a pearly, translucent papule or nodule with prominent superficial vasculature (telangiectasias), which may evolve into central ulceration over time. It generally follows a slow-growing, painless, and asymptomatic course, often resulting in delayed clinical detection. In more advanced stages, lesions may ulcerate, bleed, or become secondarily infected, leading to substantial local tissue damage.

In the case presented, the patient exhibited an ulcerated lesion with raised, pearlescent borders localized on the nasal tip—an anatomically challenging site for both excision and reconstruction. The lesion's morphology was consistent with nodular ulcerative BCC, a subtype marked by exophytic growth and central necrosis. Differential diagnoses included keratoacanthoma, squamous cell carcinoma, and nodular melanoma.

Clinically, BCC can be classified into five major variants: nodular, ulcerative, superficial (flat), erythematous, and pigmented. Accurate identification of both the clinical and histopathologic subtype is critical for tailoring the surgical approach and anticipating the tumor's local behavior.

A 68-year-old male from a rural community in Yucatán presented to the Regional General Hospital of the Mexican Institute of Social Security (IMSS) in Mérida with a two-year history of an ulcerated lesion on the nasal tip. The patient denied systemic symptoms, trauma, or prior similar lesions. He reported chronic sun exposure without photoprotection for over four decades due to his occupation as a field labourer.

On physical examination, a 1.3×1.5 cm ulcerated lesion was observed on the nasal tip (Figure 1), characterized by elevated borders, a hematic crust, peripheral telangiectasias, and infiltration of the right alar cartilage. No cervical lymphadenopathy or mucosal involvement was detected.

Figure 1 (a and b): Preoperative photograph under anesthesia showing an ulcerated, exophytic lesion on the nasal tip, demarcated for wide local excision. The lesion exhibits central crusting and erythematous borders.

A wide local excision with 4 mm safety margins was carried out. Intraoperative frozen section analysis confirmed clear surgical margins. The excised area resulted in a full-thickness nasal defect with partial cartilage exposure, necessitating a sophisticated reconstructive strategy (Figure 2).

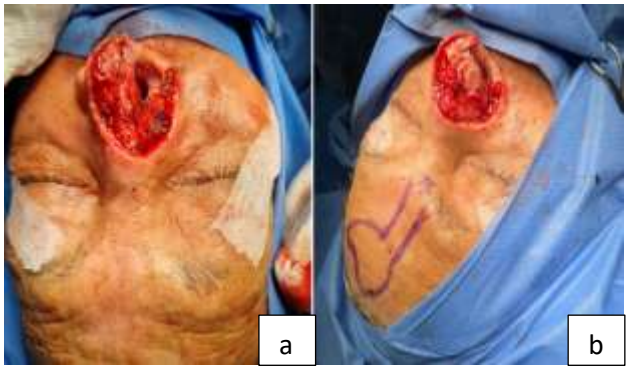

Figure 2 (a and b): Post-resection surgical defect. Partial exposure of the right alar cartilage is observed without evidence of bony invasion. Clinical margins of 4 mm were excised and confirmed negative by intraoperative frozen section analysis.

Immediate reconstruction was undertaken using a paramedian forehead flap—an axial flap based on the supratrochlear artery. This technique is widely regarded as ideal for nasal reconstruction due to its dependable vascular supply, sufficient arc of rotation, and excellent skin texture and color match. The flap was designed on the medial third of the forehead contralateral to the defect, with its longitudinal axis oriented toward the midline and appropriately dimensioned to allow tension-free coverage of the nasal wound.

Dissection was performed in the subgaleal plane while meticulously preserving the vascular pedicle. The flap was subsequently rotated into position and secured with 5-0 polypropylene simple interrupted sutures. The pedicle was left intact, with the second stage scheduled for 21 days postoperatively (Figure 3). During the second stage, pedicle division was carried out, the nasal contour was refined, and the frontal donor site was closed using an advancement technique (Figure 4).

Figure 3: Immediate postoperative frontal view following the first stage of reconstruction with an interpolated paramedian forehead flap. The flap is inset along the nasal dorsum and tip, with the vascular pedicle maintained and the donor site dressed.

Figure 4: Immediate postoperative view following the second-stage procedure. The paramedian forehead flap remains in position after pedicle division, with sutures visible at both the recipient and donor sites. The flap shows good tissue adaptation with no evidence of ischemia or hematoma.

Postoperative recovery was uneventful, with no evidence of local complications. The flap demonstrated excellent integration, and both functional restoration and aesthetic reconstruction of the nasal unit were successfully achieved. No signs of tumor recurrence were observed at the three-month follow-up.

DISCUSSION

The paramedian forehead flap (PFF) continues to be the cornerstone in nasal reconstruction following oncologic resection, particularly in complex defects involving the nasal tip and alar subunits. In our case, immediate reconstruction with a two-stage PFF yielded functionally and aesthetically favorable results with no postoperative complications or recurrence at short-term follow-up. This aligns with the classical principles described by Burget and Menick.[10]

Previous studies have validated the high success rate and versatility of the PFF across diverse patient populations. Baker and Swanson report over 90% flap survival with excellent patient satisfaction, citing the robust supratrochlear vascular supply and low donor site morbidity.[11] Similarly, a retrospective series by Singh et al on 45 patients demonstrated minimal complication rates and superior aesthetic outcomes when employing a two-stage forehead flap for nasal reconstruction post-BCC excision.[12]

From an oncologic perspective, the approach employed ensured complete excision with histologically negative margins, followed by immediate coverage with well-vascularized tissue. This strategy not only avoids the risk of wound contraction and secondary deformity but also supports early restoration of nasal architecture. Compared to conservative or delayed reconstructive strategies, immediate PFF reconstruction has been shown to improve long-term functional outcomes and reduce psychological distress in patients undergoing facial oncologic surgery.

CONCLUSION

The paramedian forehead flap remains an essential and time-tested technique in the reconstructive arsenal for managing full-thickness nasal defects following oncologic resection of basal cell carcinoma. Its predictable vascularity, optimal skin match, and structural versatility make it the gold standard for complex nasal reconstruction, especially when both functional integrity and aesthetic restoration are paramount. This case reinforces the importance of immediate, anatomically guided reconstruction and adds clinical evidence supporting the superiority of the two-stage interpolated forehead flap in achieving durable, complication-free outcomes in high-risk facial zones. This case demonstrates the continued value of the paramedian forehead flap in facial reconstruction following oncologic resection. Its reliability, vascularity, and favorable cosmetic results

make it an essential tool in managing complex nasal defects.

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