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Case Report

Frontonasal paramedian flap, a Marchac flap variation used for nasal tip reconstruction after basal cells carcinoma, a suitable option for large defects: case report

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ABSTRACT

Basal cell carcinoma (BCC) is the most common cutaneous malignancy encountered in clinical practice. Lesions frequently arise on sun-exposed facial areas, with the nose being particularly vulnerable. Oncologic management is often straightforward but reconstruction of functionally and aesthetically sensitive regions such as the nasal tip tends to be more complex. We present the case of a 64-year-old woman with a long-standing lesion involving the nasal tip without major symptoms; however, she noticed bleeding, pruritus, pain on palpation, and a mild ulceration. On examination, the lesion demonstrated clinical features suspicious for malignancy. A diagnostic biopsy was therefore performed and showed a nodular BCC infiltrating the superficial and reticular dermis, with the lesion in contact with the lateral surgical margin. Given these findings, surgical management was indicated. The patient underwent wide local excision of the lesion under appropriate anesthesia. Intraoperative margin evaluation confirmed complete tumor removal with histologically clear margins. The resulting defect of the nasal tip was reconstructed using a frontonasal flap, selected to provide reliable vascularity and adequate tissue match for this region. This case shows the importance of oncologic and reconstructive planning in the management of BCC of the nasal tip. It also supports the reliability of the frontal flap as a reconstructive option, providing acceptable functional and aesthetic results following tumor excision.

Keywords: Basal cell carcinoma, Frontonasal flap, Nasal tip reconstruction, Large defects

INTRODUCTION

Basal cell carcinoma (BCC) is a malignant tumor that arises from epithelial cells and is strongly linked to chronic exposure to ultraviolet radiation. It is currently recognized as the most common form of skin cancer worldwide, with an estimated lifetime risk of nearly one in five individuals in the United States.[1] Although BCC rarely metastasizes due to its relatively slow growth pattern, it can exhibit a markedly invasive local behavior. If left untreated, the tumor may progressively infiltrate surrounding tissues and lead to significant structural destruction.

The head and neck region accounts for the majority of cases, with approximately 80% of BCCs occurring in this anatomical area. Among these, the nose represents one of the most frequently involved sites, accounting for roughly 25-30% of lesions.[2] Because of its central position on the face, the nose plays a key role in both facial aesthetics and respiratory function. Its complex three-dimensional anatomy is commonly divided into several aesthetic subunits, a concept that is essential when planning reconstructive procedures after oncologic excision. Respecting these subunits often helps achieve more harmonious and natural postoperative results.

The frontonasal flap was first introduced by Rieger in 1967 as a random-pattern cutaneous flap harvested from the nasal dorsum and glabellar region, based on one side of the nose. A few years later, in 1970, Marchac refined this technique by describing it as an axial skin–muscle flap supplied by a branch of the angular artery, specifically the supratrochlear artery. Since its description, the flap has become a well-established option for reconstruction of defects involving the nasal tip and dorsum. Its dependable vascular supply allows it to be elevated either with a narrow skin pedicle or as an island flap to improve mobility. An additional advantage of this technique is the ability to recruit tissue from areas with relative skin redundancy-such as the glabella and nasal dorsum-and transfer it to regions where tissue is limited, including the nasal tip and alar areas, while maintaining a good match in color, thickness, and texture with the surrounding skin.[3]

CASE REPORT

This is a 64-year-old female patient with a significant medical history of arterial hypertension, diabetes mellitus, an extra-axial lesion consistent with probable meningioma, as well as epilepsy secondary to the condition mentioned above. Her current illness began several years ago with the presence of a well-defined lesion on the tip of the nose, but approximately 10 months ago, she began with bleeding, pruritus, and pain on palpation, associated with mild ulceration. A biopsy was performed. The histopathological report is attached, which states:

Macroscopic description

Two irregular fragments of skin are received, which together measure 0.6×0.3×0.2 cm. They are light brown, rough, and soft.

Diagnosis

Nodular BCC infiltrating the superficial and reticular dermis, with the lesion in contact with the lateral surgical margin. Defined as Stage I (T1N0M0) according to the AJCC.

She was therefore referred to the Oncologic Surgery and Plastic and Reconstructive Surgery departments for evaluation and management.

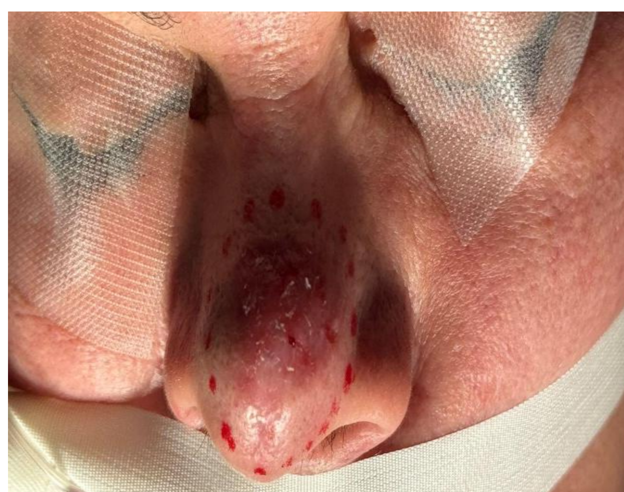

Figure 1: Macroscopic view of the lesion previously marked.

Once balanced general anesthesia with orotracheal intubation was induced, the lesion area was marked with a permanent marker (Figure 1). Subsequently, A wide resection of the nasal tip lesion was performed by the oncologic surgery team with an intraoperative biopsy to assess the need for further enlargement of the resection. The lesion was reported with clear margins, and thereafter, reconstruction was carried out by the plastic surgery team. A frontonasal paramedian flap (Marchac flap) was chosen, due to the location and extent of the lesion, as well as an unfavorable relationship between the nasal ala and the nasal tip for performing a local flap. The reconstruction procedure began with the measurement of the defect that was approximately 4 cm in diameter, involving the nasal tip subunit, the distal portion of the nasal dorsum, and the peripheral areas of the alae, with exposure of the crural arches without compromise of the internal lining. A frontonasal flap based on the left supratrochlear artery was designed and measured; subcutaneous dissection was performed in the cephalic third of the flap, submuscular dissection in the middle third, and subperiosteal dissection in the caudal third up to the pivot point, with the conservation of the arterial

pedicle. Hemostasis was achieved, the flap was rotated into position and secured with 6-0 Prolene sutures. Flaps were elevated on both sides of the donor site, which was closed in layers with 2-0 Vicryl and 4-0 Prolene. The flap was 100% viable, with no complications. Unfortunately, intraoperative photographs are unavailable due to institutional regulations.

The immediate postoperative course was uneventful, with the frontal wound well approximated and the sutures at the tip of the flap on the nose in good condition. The patient was re-evaluated 12 hours postoperatively, showing no alterations such as color changes, with immediate capillary refill; therefore, she was discharged home with analgesic and antibiotic therapy, wound care instructions, and a follow-up appointment. The patient is scheduled for a subsequent appointment in a few months due to the long waiting time caused by high hospital demand; therefore, we do not have postoperative images after flap division at the moment.

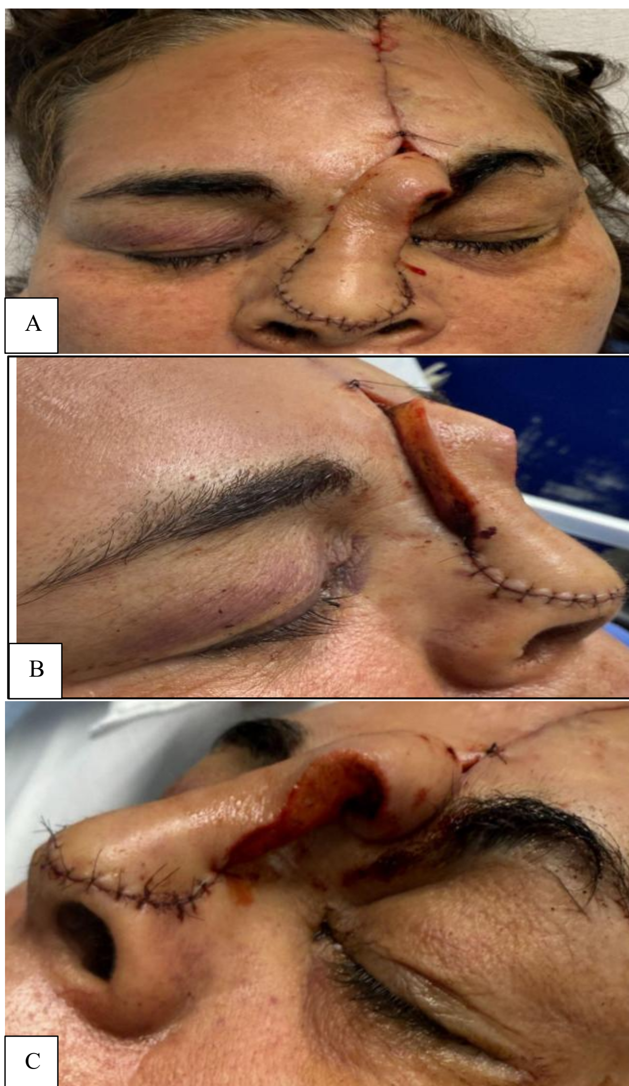

Figure 2 (A-C): Frontonasal paramedian flap 12 hours postoperative from different views: frontal, right, and left.

DISCUSSION

BCC is the most common cutaneous malignancy worldwide and predominantly affects chronically sun-exposed areas of the head and neck. Approximately 80-85% of BCCs arise in this region, with the nose-particularly the nasal tip-being the most frequently involved site. The nasal tip is considered a high-risk anatomical area due to its complex three-dimensional structure, limited tissue reserve, and increased likelihood of subclinical tumor extension, which contributes to higher recurrence rates when excision is incomplete.[3-5]

Nodular BCC represents the most common histological subtype and is generally associated with slow growth and a favorable prognosis. However, dermal invasion and margin involvement are well-established risk factors for local recurrence, particularly in high-risk facial locations such as the nasal tip. Long-standing lesions may demonstrate progressive local invasion despite their typically indolent behavior.[6,7]

Intraoperative margin control is especially valuable in high-risk facial tumors, as it allows confirmation of complete tumor removal while preserving uninvolved tissue. Achieving histologically clear margins is considered the most important prognostic factor in reducing recurrence rates of BCC, particularly in cosmetically sensitive areas.[8,9]

This reconstructive technique is widely used for large or complex nasal defects, especially those involving the nasal tip. The frontonasal flap provides excellent color and texture match, a robust axial blood supply given by the supratrochlear artery, and high reliability, allowing restoration of both functional and aesthetic nasal subunits.[10,11]

Reconstruction after excision of BCC in high-risk nasal areas must ensure oncologic safety while preserving nasal function and aesthetics. Frontonasal flaps provide reliable vascularity and good tissue match; however, the reconstructive strategy should be adapted to the size and complexity of the defect.

Single-stage frontonasal flaps are suitable for small to medium defects and offer the advantage of completing reconstruction in one procedure, with reduced overall morbidity.[12,14] Nevertheless, their limited reach and reduced capacity for tension control and contour refinement may restrict their use in larger or more complex nasal defects, particularly those involving the nasal tip.

Two-stage frontonasal reconstruction allows improved vascular reliability, controlled thinning, and progressive contour refinement, leading to superior functional and aesthetic outcomes in complex cases.[15-17] In the present case of BCC of the nasal tip, a two-stage approach was selected to achieve adequate defect coverage and optimal

contouring, supporting the use of staged reconstruction in selected high-risk nasal tumors. The following table compares both techniques and facilitates a more effective selection of the appropriate treatment approach (Table 1).

Table 1: Comparison between single stage vs. multi stage frontonasal flap.

Feature	Single-stage frontonasal flap	Two- or multi-stage frontonasal flap
Number of surgeries	One[12-14]	Two or more[15-17]
Defect size	Small to medium[13,14]	Medium to large[15-17]
Margin control	Limited[1,2]	Greater, allows intraoperative refinement[4,5]
Aesthetic refinement	Limited secondary contouring[1,3]	Optimal contouring and thinning possible[4-6]
Overall morbidity	Lower overall morbidity[2,3]	Higher due to multiple procedures[4,6]
Long-term outcome	Good in selected cases[2,3]	Superior in complex defects[4-6]

Early postoperative monitoring is critical for flap viability, particularly in patients with comorbidities such as diabetes mellitus and hypertension, which are known to negatively impact wound healing and increase the risk of postoperative complications. Careful perioperative management contributed to a favorable early outcome and safe discharge.[18]

Overall, this case emphasizes the importance of early diagnosis, complete surgical excision with margin control, and appropriate reconstructive planning in the management of BCC located in high-risk facial regions. Current clinical guidelines recommend a multidisciplinary approach combining oncologic and reconstructive expertise to optimize tumor control, minimize recurrence, and achieve satisfactory functional and cosmetic outcomes.[9,18]

CONCLUSION

BCC of the nasal tip represents a complex therapeutic scenario in which oncologic safety must be carefully balanced with functional preservation and aesthetic restoration. Achieving histologically clear margins remains the cornerstone of treatment, particularly in high-risk facial subunits where subclinical tumor spread frequently challenges surgical planning. Within this context, reconstructive decision-making plays a critical role not only in defect closure but also in long-term functional and aesthetic outcomes. The present report contributes to current reconstructive knowledge by illustrating the practical application and advantages of the frontonasal paramedian flap, a variation of the Marchac flap, in managing extensive nasal tip defects following oncologic resection. This case highlights how a staged reconstructive strategy enables progressive vascular adaptation, controlled flap thinning, and precise contour refinement, thereby optimizing integration with nasal aesthetic subunits. Importantly, it demonstrates that reliable reconstruction can be achieved even in patients with comorbidities traditionally associated with impaired wound healing. By documenting surgical planning, flap selection rationale, and early postoperative outcomes, this study advances understanding of patient-specific reconstructive algorithms for nasal tip reconstruction. It supports the concept that staged frontonasal reconstruction represents a reproducible and effective alternative for complex defects, expanding the reconstructive armamentarium beyond more commonly reported techniques. Overall, this case underscores that successful management of nasal tip BCC depends on the integration of oncologic principles with tailored reconstructive strategies. The findings reinforce the value of individualized, algorithm-driven reconstruction and provide practical clinical insight that may guide surgeons in selecting predictable and aesthetically favorable solutions for challenging nasal defects.

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