

Reconstruction of Large Nasal Sidewall Defect via Perialar Crescentic Advancement Flap: A Case Report

Lawrence Sing Siong Kong¹, Renhui Lo², Guhan Kumarasamy², Norhafiza Mat Lazim^{1*}

1. Department of Otorhinolaryngology, Head and Neck Surgery, University Sains Malaysia, Kubang Kerian, Kota Bharu, Kelantan, Malaysia

2. Department of Otorhinolaryngology, Head and Neck Surgery, Hospital Raja Permaisuri Bainun, Ipoh, Perak, Malaysia

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Corresponding Authors:

Dr. Norhafiza Mat Lazim

Email:

norhafiza@usm.my

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Abstract

Background: Basal cell carcinoma (BCC) is the most common non-melanoma skin malignancy, which may frequently affect the nasal region. Reconstruction of the nasal sidewall defects presents a significant functional and aesthetic challenge. The modified perialar crescentic advancement (PACA) flap offers a single-stage and reliable surgical option.

Case Presentation: We describe a 61-year-old woman with a 3x3cm BCC on the right side of the nasal side. Following a complete excision with a 5 mm margin, the defect was reconstructed using a modified PACA flap. In the flap design, we utilized the medial cheek as a donor site, with a crescentic excision along the alar groove to achieve optimal contour. The histopathology confirmed complete excision with tumor-free margins. The patient had an uneventful recovery, with satisfactory functional and cosmetic outcomes at 2 months of follow-up.

Conclusion: The PACA flap is a versatile, reproducible technique for medium to large nasal sidewall defects, allowing excellent aesthetic integration and minimal donor site morbidity.

Conflicts of Interest: The Authors declare no conflicts of interest.

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Introduction

Basal cell carcinoma (BCC) stands as the most prevalent non-melanoma skin malignancy, frequently manifesting in the head and neck region, particularly on the eyelid and nose (1). Characterized by its slow growth, local invasiveness, and infrequent metastasis, BCC predominantly affects older individuals who have experienced frequent exposure to ultraviolet radiation (1, 2).

The reconstruction of surgical defects following the excision of basal cell carcinoma of the nasal sidewall presents a substantial challenge. Numerous techniques have been devised for defect closure, encompassing advancement flaps, rotation flaps, transposition flaps, staged interpolation flaps, and grafts (3). The perialar crescentic advancement (PACA)

flap presents a single-stage surgical solution characterized by a shorter learning curve, low post-operative morbidity, and favorable functional and cosmetic outcomes (3).

Case Presentation

A 61-year-old female patient, without any significant comorbidities, presented with a painless, slowly growing mass on the right nasal sidewall for five years. No nasal obstruction, epistaxis, cervical lymphadenopathy, or constitutional symptoms were reported.

Examination

Upon local examination, the lesion was approximately 3x3 cm in size and involved the right nasal sidewall, extending to the nasolabial fold and the superior aspect of the nasal ala

curvature. The lesion exhibited rolled edges, hyperpigmentation, and central ulceration. Rigid naso-endoscopy revealed normal bilateral nasal cavities and nasopharynx. Neck examination revealed no palpable lymph node. A punch biopsy confirmed the diagnosis of basal cell carcinoma (BCC).

Surgical procedure

Under general anesthesia, the tumor was excised en-bloc with 5mm of surgical margin, resulting in a defect measuring 4x4 cm. Reconstruction was performed using modified PACA flap as described by Bouchard.

A triangular incision was made superior to the defect parallel to the nasofacial junction. Concurrently, a crescentic shaped incision was made from the inferior edge along the alar groove to the nasal sill, with the crescent width

approximately equal to the defect width. The cheek skin was undermined along the subnasalis plane and subcutaneous fat to allow medial advancement. Several buried 4/0 absorbable sutures were placed to secure the flap and facilitate its advancement. Finally, the defect was closed using interrupted 4/0 non-absorbable sutures. The alar-facial groove was recreated to maintain aesthetic subunit boundaries.

The patient recovered uneventfully. Sutures were removed on postoperative day 7, with minimal edema and no flap compromise. At 2 months follow-up, the scar was well-concealed, and nasal symmetry was preserved. There was no recurrence, and the patient was satisfied with the aesthetic outcome (Figures 1-4).



Figure 1: Pre-operative: Basal cell carcinoma over the right nasal sidewall (Blue arrow)

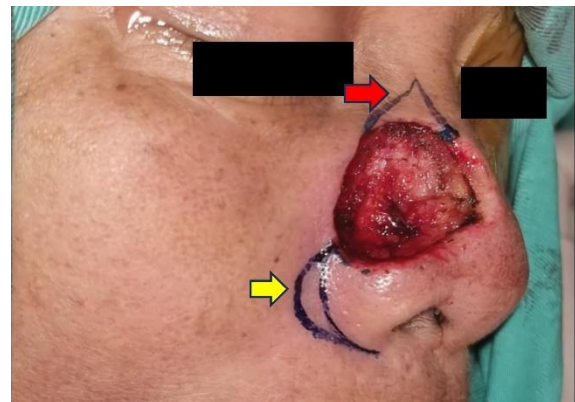


Figure 2: Flap planning after excision of tumor. Triangular incision superiorly (Red arrow) and crescentic incision inferiorly (Yellow arrow)



Figure 3: Cheek wall used as a reservoir for medical advancement to close the defect (Blue arrows)



Figure 4: 2 months post-operative follow-up shows a good aesthetic outcome

Discussion

The nasal sidewall lies within the central facial aesthetic unit, making reconstruction particularly challenging. The goal of nasal reconstruction is to achieve an aesthetically pleasing outcome while preserving nasal function. The key principle is to respect aesthetic subunits and to replace defects with skin of similar texture and color, as well as good vascularization for healing (4).

The history of the PACA flap goes back to 1845, when Dieffenbach introduced an S-shaped perialar incision, and Burrow suggested the removal of triangular tissue above and below the cheek pedicle flaps to facilitate advancement without causing significant distortion of the facial structures. Both techniques were subsequently combined and improved by Stone in 1908 to minimize visible scarring. Webster, in 1955, further modified the peri-alar incision and crescentic cheek tissue excision to extend the upper skin edge of lip and cheek flaps, allowing for approximation of the edge of the defect to the nasal ala without distortion. Initially designed to address defects of the upper lip, this flap underwent a significant evolution in 1989 when Hill introduced the perialar arc rotation flap (PARF). In this technique, the crescent is extended around the alar complex, simultaneously rotating the upper lip and cheek superiomedially. This approach yields a more aesthetically pleasing outcome in young patients with less pronounced melolabial folds. Various methods of PACA flap include conventional PACA, PARF, and superomedial rotation flap (5-8). These flaps are utilized in defects at sites such as the lateral nose, perialar region, nasolabial fold, and upper lip (9, 10). In this particular case, we employed the modified PACA flap as described by Borchard.⁶ Borchard reported 25 patients undergoing modified PACA flap reconstruction for defects measuring 1.3–3.0 cm in diameter following basal cell carcinoma (BCC) excision. This technique utilizes the medial cheek wall as a

reservoir to conceal the defect and disguises incision lines within aesthetic borders, thereby minimizing distortion to facial structures. Optimal contour and symmetry were achieved without donor site morbidity. All patients expressed high satisfaction, with minimal complications limited to transient ecchymosis and no flap loss. Compared to bilobed or interpolation flaps, the PACA flap presents a shorter learning curve, single-stage closure, and lower complication rates. This supports the reliability and reproducibility of the technique for medium-to-large nasal sidewall defects. Limitations include reduced applicability when multiple subunits are involved, in which case paramedian forehead or melolabial flaps may be indicated.

Earlier approaches, as outlined by Mellette and Harrington, have demonstrated good cosmetic outcomes and scar concealment along natural creases, though occasional trapdoor effects and contour irregularities have been reported.⁹ Costin described the PACA flap for nasal sidewall defects up to 2 cm, achieving excellent cosmetic results with no complications and preservation of nasal subunit definition.³ This technique is particularly useful for small to medium defects, where local tissue characteristics allow primary advancement without distortion. Djawad described a bilateral crescentic cheek-to-nose advancement flap to close a 2.5 cm dorsum and sidewall defect.¹¹ This method preserved the alar crease and nasofacial sulcus, providing excellent symmetry, and no complications at 3 months. For very large or complex nasal defects, Perdakis emphasized that the staged paramedian forehead flap should remain the gold standard, provide optimal skin match, structural support, and consistently high satisfaction rates when performed with meticulous planning (12).

Overall, the modified PACA flap represents a versatile, single-stage option for medium-to-large nasal sidewall defects, offering excellent functional and aesthetic integration, minimal complication risk, and high patient satisfaction.

Selection of technique should be individualized, considering defect size, location, patient preference, and surgeon expertise.

Conclusion

The modified PACA flap is a single-stage flap that preserves nasal symmetry and airway without interpolation or grafts. It is a relatively simple and reliable technique for ENT surgeons to perform with excellent cosmetic results, as the scar is concealed within the natural borders of the alar-facial groove and nasolabial fold.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Authors ORCIDiDs

Norhafiza Mat Lazim

<https://orcid.org/0000-0002-2367-1814>

Lawrence Sing Siong Kong

<https://orcid.org/0000-0002-8955-9278>

Renhui Lo

<https://orcid.org/0000-0001-7551-6544>

Guhan Kumarasamy

<https://orcid.org/0000-0002-4613-3496>

Norhafiza Mat Lazim

<https://orcid.org/0000-0002-2367-1814>

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