

# Single-Stage Reconstruction of A Large-Sized Nasal Skin Defect Using Bilateral Nasolabial Transposition Flaps

## — A Case Report

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### **Background:**

Full-thickness nasal defects may result from trauma or tumor resection, and the management of these defects can pose a significant challenge. There have been rare reports on using bilateral nasolabial transposition flaps to reconstruct a large nasal defect.

### **Aim and Objectives:**

We report the reconstruction of a large nasal defect using bilateral nasolabial rotation flaps after the wide excision of a basal cell carcinoma.

### **Materials and Methods:**

An 89-year-old male patient with a tumor on his nose that had been treated conservatively for 1 year. The histological examination revealed basal cell carcinoma with focally infiltrative features. Because of the patient's age and pre-existing comorbidities, we performed a wide excision of the tumor and reconstructed the resulting defect in a single-stage procedure with bilateral nasolabial transposition flaps under local anesthesia.

### **Results:**

At the 15-month follow-up, the flaps showed survived without evidence of local recurrence. The resulting short nose deformity with cephalic rotation of the left nasal alar lobule improved during the follow-up period. This patient was satisfied with the cosmetic outcome and refused any further surgery.

### **Conclusions:**

In this patient, we successfully used bilateral nasolabial transposition flaps to reconstruct a nasal defect. It is an effective, simple, single-stage reconstructive procedure to repair large nasal defects. (J Taiwan Soc of Plast Surg 2016;25:163~169)

**Key words:** nasal defect, basal cell carcinoma, nasolabial flap

## Introduction

The nose is an important esthetic unit of the human face and is a complex anatomical structure consisting of several subunits, including the tip, dorsum, sidewalls, alar lobules, and soft triangles<sup>1</sup>. Nasal defects occur because of various causes, including trauma and the excision of a neoplasm. The wide excision of a skin cancer, particularly a basal cell carcinoma (BCC), is the leading cause of nasal defects in the Asians; however, the incidence of nasal defects is not as high as in Caucasians<sup>2</sup>. Reconstruction of the resulting nasal defect poses a significant challenge, options from skin grafts to complex free-tissue transfers, have been proposed<sup>2-4</sup>. Each nasal defect must be individually evaluated and reconstructed to meet not only a patient's esthetic requirements but also functional needs. In general, the defect location, size, and depth are the most important factors to be considered for reconstruction. Other factors include the characteristics of the original lesion, the patient's age and physical status, the patient's wishes, and the surgeon's experience<sup>3</sup>. We report a case in which bilateral nasolabial transposition flaps were used to reconstruct a large defect involving the dorsum, and right sidewall of the nose after BCC resection.

## Materials and Methods

An 89-year-old male patient was presented with a tumor on his nose that had been treated conservatively for 1 year. The clinical examination revealed an approximately  $2.5 \times 1.3$  cm tumor with ulceration in the region of the dorsum and right lateral sidewall of the nose (Figure 1). Excisional biopsy revealed the presence of a basal cell carcinoma with focally infiltrative features. Because of the patient's age and pre-existing comorbidities, we decided to perform a wide excision of the tumor and to reconstruct the resulting defect in a single-stage procedure under local anesthesia. When pathological examination confirmed that the resection margins were tumor-free, a  $4.0 \times 3.6$  cm full-thickness defect involving the nasal dorsum, and right sidewall with cartilage exposure was noted

(Figure 2). The bilateral nasolabial transposition flaps were designed with medial incisions that followed the nasolabial sulcus and were elevated in the subcutaneous plane. These flaps were transposed onto the nasal defect from opposite sides and sewn in place with tensionless sutures. The donor sites were primarily closed (Figure 3). This patient was discharged after the surgery and dressing changed using neomycin ointment four times a day by his caretaker.

## Results

The flaps survived at his outpatient visit for suture removal 10 days postoperatively (Figure 4). Although there was short nose deformity with cephalic rotation of the left nasal alar lobule, which resulted from the left medial nasolabial advancement to the nasal dorsum and ala, this patient was satisfied with the cosmetic outcome. At his 15-month follow-up after surgery, the reconstructed nose was mildly asymmetrical; however, the patient refused to undergo any further surgery. The donor-site scars were well-hidden in the existing nasolabial creases (Figure 5). Furthermore, there was no evidence of local recurrence during the follow-up period.



Fig. 1. A  $2.5 \times 1.3$  cm<sup>2</sup> tumor with ulceration in the region of the dorsum and right lateral sidewall of the nose.



Fig. 2. A  $4.0 \times 3.6 \text{ cm}^2$  full-thickness defect involving the nasal dorsum, and right sidewall with cartilage exposure after wide excision of the tumor.



Fig. 3. Bilateral nasolabial transposition flaps ( $3.0 \times 2.5 \text{ cm}^2$  each) were designed with the medial incisions that follow the nasolabial sulcus, transposed into the nasal defect, and sewn in place with tensionless sutures. The donor sites were closed primarily.



Fig. 4. (a) Right side view (b) Front view (c) Left side view. Survival of the flap at 10 days after surgery. The short nose deformity with cephalic rotation of the left nasal alar lobule was noted.



Fig. 5. (a) Right side view (b) Front view (c) Left side view. 15 months after surgery, the short nose deformity with cephalic rotation of left nasal alar lobule had improved but the right nasofacial angle was blunter than the left side.

## Discussion

Skin defects on the nose are a challenge for the plastic surgeon because of the nose's unique structure and its important esthetic value for the face. Nasal defects are mostly caused by skin cancer, particularly in elderly patients. BCC is the most common type of skin cancer and is considered to be caused by sunlight exposure<sup>2</sup>. Surgery is the gold standard for treating BCC on the nose, and the resulting defects should be reconstructed in a single-stage surgery if possible. The characteristics of the lesion, including location, size, and depth; age of the patient; the skin laxity; physical status; the patient's wishes; and the surgeon's experience play important roles for selecting the optimal reconstruction method for nasal defects<sup>3-5</sup>. Among these factors, the size, depth, and anatomical location of the nasal defect were the most important ones for selecting the reconstruction method to cover the defect<sup>6-10</sup>.

When the defect diameter >2.0 cm or involves more than two subunits of the nose, more tissue is usually required. For large nasal defects, reconstruction techniques include full-thickness skin grafts (FTSGs), advancement flaps, bilobed flaps, nasolabial flaps, forehead flaps, and free flaps that have been described in the literature<sup>7,9,10</sup>. Each technique has its merits and demerits. FTSGs are indicated for large defects in high-risk patients who cannot tolerate general anesthesia for more complex procedures, and those who require close surveillance for the recurrence of malignancy. The basic concern with regard to using FTSGs has been the resultant patchwork appearance caused by color mismatch and contour defects on the skin<sup>9</sup>. In addition, FTSGs are not considered for deep defects with cartilage or bone exposure because of a higher risk of graft *loss*.

Advancement flaps, particularly from the cheek, have been used for repairing medium and large defects in the nasal dorsum and sidewalls. If the defect involves multiple subunits or crosses the midline of the nose, a bilateral cheek-to-nose advancement flap (i.e., the malar butterfly flap as advocated by Nakhla et al<sup>11</sup>) could be an alternative method in patients with strong

nasolabial folds and prominent cheek tissue laxity. However, the extending dissection under general anesthesia and longer scar length are both a concern and disadvantage associated with this technique<sup>11,12</sup>. The bilobed transposition flap is best suited for defects of the distal half of the dorsum, sidewalls, and the central or lateral tip of the nose that were <1.5 cm in diameter<sup>2,9</sup>. It has the advantage of being a single-stage flap of simple design that has excellent color and texture match with the adjacent tissues. However, its disadvantages are that it has complex incision lines, is limited to the closure of small and medium nasal defects, and distorts the symmetry of the distal nose if not planned appropriately<sup>13,14</sup>.

The forehead flap is a two-stage reconstruction, which is indicated for larger nasal defects that are >2.0 cm in diameter<sup>2,7,9</sup>. It is an axial flap based on the ipsilateral supratrochlear artery and provides an excellent color match with relatively minimal donor-site morbidity. However, its demerits are that it requires a two-stage procedure at minimum, has a resultant vertical scar at the mid-portion of the forehead, and requires that the patient should accept having a pedicle across the mid-face for approximately 3-4 weeks between stages<sup>15,16</sup>. Free flap reconstruction has been reported to treat extensive and complex nasal defects. This extremely intricate procedure uses a large skin paddle, which enables the reconstruction of both the skin and nasal lining with a single flap. However, the major disadvantages of distal flap coverage for a nasal defect are an absence of skin texture and color match, the apparent donor-site morbidity, and the need for two or more separate surgical procedures. Furthermore, the psychological state, medical comorbidities, and general health conditions that can tolerate the prolonged operative time are fundamental concerns when performing microvascular reconstruction of nasal defects<sup>17,18</sup>.

The nasolabial flap was first described by Jonathan Mason Warren in 1840 for the reconstruction of nasal defects. More recently authors have described modifications of the technique and staged methods after preliminary tubing for defects of the columella beneath an intact ala<sup>20</sup>. It is a well-known versatile

procedure that provides a reliable source of skin and an excellent color match, rarely leaves a significant donor-site deformity, and provides an excellent solution for the reconstruction of full-thickness nasal defects with diameters between 1.5 and 2.0 cm<sup>9,20</sup>. The donor site is primarily closed, particularly in elderly patients in whom skin redundancy at the nasolabial fold is abundant. Furthermore, the donor-site scar can be well-hidden in the existing nasolabial crease<sup>2,9,20</sup>. The disadvantages include asymmetry caused by blunting of the nasofacial angle and a high risk for pin cushioning if the flap is not appropriately sized<sup>21</sup>. In our case, the bilateral nasolabial transposition flaps based on the design and concept of rhombic flap were used because of the large defect location, the patient's age, skin laxity, and pre-existing comorbidities. This should decrease the surgery time, reduce patient risks, and provide a large skin piece and fascia. Although an acquired short nose deformity with cephalic rotation of the left nasal alar lobule was observed at first, the deformity gradually improved during the follow-up period. Blunting of the right nasofacial angle was observed by his family; however, the patient was satisfied with the cosmetic outcome and refused any further surgery.

### Summary

Based on our experience, we recommend the use of the single-staged bilateral nasolabial transposition flaps to reconstruct a large nasal defect that involves multi-subunits in a high-risk patient who cannot tolerate general anesthesia for more complex procedures and has skin laxity at the nasolabial fold, particularly in the elderly. It provides an effective, simple, single-stage method to reconstruct large nasal defects. The acquired deformity is esthetically acceptable using this technique.

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# 使用雙側鼻唇溝轉位皮瓣單一階段手術重建鼻部 大範圍皮膚缺損 —— 病例報告

尤傑銘 蔡明峰 黃文成 董光義 張世幸

## 背景：

鼻部的全層皮膚缺損常導因於外傷或腫瘤切除術後，而重建大範圍鼻部缺損是具有挑戰性的，而使用雙側鼻唇溝轉位皮瓣單一階段手術重建鼻部大範圍全層皮膚缺損的文獻報告是少見的。

## 目的及目標：

我們提出一個原發性的鼻部基底細胞癌，做廣泛性切除後接受雙側鼻唇溝轉位皮瓣重建術後的結果及追蹤。

## 材料及方法：

一名 89 歲的鼻部腫瘤患者，已保守性治療達一年之久。切片病理報告顯示為基底細胞癌併局灶性。考量病患的年紀及潛在合併症，我們在局部麻醉下施行廣泛性的腫瘤切除及雙側鼻唇溝轉位皮瓣重建的一次性手術。

## 結果：

經過 15 個月的追蹤，皮瓣癒合良好且沒有任何併發症或腫瘤復發的跡象。雖然起先有朝天鼻畸形併左側鼻翼上揚的情形，但追蹤後逐漸改善，患者滿意該外觀及拒絕再接受任何鼻部外觀矯正手術。

## 結論：

重建鼻部大範圍皮膚缺損是具有挑戰性的，而且可以做為重建的選擇並不多。我們成功的利用雙側鼻唇溝轉位皮瓣重建較大的鼻部缺損。這是一個相對簡單有效率及單一階段就可以完成的手術。