

Island composite nasal flap for nasal dorsum skin defects

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Abstract

Background Skin defects on the nasal dorsum remain a challenge for the plastic surgeon.

There are few local nasal flap options for the repair of proximally positioned nasal skin defects.

Methods During a 3-year period, 22 patients were treated after excision of skin cancer in the proximal two-thirds of the nose. Nine patients (41%) were female and 13 (59%) were male, with an average age of 69 years. All patients were operated on under local anesthesia. The average follow-up was 25 months.

Results In all patients, after tumor ablation, the skin defect was closed with an island composite nasal skin flap. Pathohistologic analysis confirmed that the margins of the removed tumor were free of malignant cells. Six patients (27.3%) had squamous cell and 16 (72.7%) had basal cell carcinoma. There was no total or partial flap loss. None of the patients has suffered from recurrence of the tumor.

Conclusions The island composite nasal flap is a reliable technique for the closure of proximal nasal skin defects. Complications in the elevation of the island composite flap were rare, and the final result was acceptable.

Introduction

The nose is the most visible part of the human face and defines an individual's physiognomy. Therefore, the surgical removal of a pathologic change from nasal skin, which leaves behind a skin defect, must be repaired as well as possible. One of the most frequent pathologic changes at the nose is, beyond doubt, skin cancer,¹ particularly at the nasal dorsum.² The dorsum of the nose extends from the supratip depression inferiorly to the glabella region superiorly. To ensure that the tumor has been removed completely, an appropriate surgical repair must fit two essential requirements: first, it must excise the tumor to a sufficiently wide margin to be in healthy skin and, second, it must excise sufficiently deep to ensure that there are no tumor cells left behind in the tumor base, i.e. in subcutaneous tissue. The best way to achieve this is to send frozen samples for immediate pathohistologic analysis and to wait for the results. Once the field has been proven to be free of tumor cells, the skin defect must be closed. Particular attention must be paid to tumors involving the embryonic fusion planes (H-zone), as these tumors can infiltrate the tissues much more deeply than is apparent at the surface.³

We found an island composite flap to be appropriate for the repair of skin defects after tumor removal from the nasal dorsum, where there is much vascularization, particularly from the branches of the dorsal nasal artery.

The dorsal nasal artery is the largest terminal branch of the ophthalmic artery.^{4,5} This vessel, after penetrating through the orbital septum, runs behind the orbicularis oculi muscle, i.e. beyond the medial canthal ligament, and becomes superficial in the deep subcutaneous layer at the nasal region and the upper lateral nasal wall.

The dorsal nasal artery supplies the skin around the root of the nose, having, at the same time, dense connections of anastomoses to the angular branch of the facial artery. The angular branch, however, gives off small branches to the nose. When at least one of these branches is of a large diameter, it is called the lateral nasal artery.⁵

The dorsal nasal artery can occasionally be absent, however.⁴ The individual vascularization in this region is best checked by Doppler examination. Preoperative Doppler examination at the level of the inner palpebral ligament may indicate the presence (or absence) of the dorsal nasal artery and its course.

Materials and Methods

During a 3-year period (December 2004 to December 2007), 22 patients (Table 1) were treated after excision of skin cancer in the proximal two-thirds of the nose. Nine patients (41%) were female and 13 (59%) were male; their age range was from 36 to 89 years (average, 69 years). Of the 22 patients, 17 (77.3%) lived in a

Table 1 Epidemiologic data of the 22 patients treated with a composite nasal flap

Patient	Sex	Age (years)	Residence	TNM tumor classification	Size of defect (mm)
1	M	59	Village	1	18 × 18
2	F	89	Village	2	38 × 30
3	M	87	Village	1	24 × 19
4	M	69	Village	1	24 × 20
5	M	62	Village	1	22 × 20
6	F	36	Town	1	26 × 24
7	M	68	Village	2	34 × 30
8	M	74	Village	1	24 × 22
9	M	72	Village	1	20 × 18
10	F	64	Village	2	30 × 22
11	M	73	Village	2	32 × 26
12	M	59	Village	1	25 × 20
13	M	41	Town	1	27 × 22
14	F	80	Town	2	33 × 24
15	M	82	Village	2	32 × 27
16	F	66	Town	1	18 × 16
17	F	66	Village	1	20 × 20
18	M	64	Village	1	15 × 12
19	F	72	Village	1	22 × 18
20	F	72	Village	1	26 × 22
21	F	60	Village	1	20 × 20
22	M	84	Town	1	18 × 16

F, female; M, male.

village and five (22.7%) in a town. All patients were operated on under local anesthesia. The average follow-up was 25 months.

Surgical technique

After wide excision of the tumor, the flap was outlined over the region of the procerus muscle near the defect (Fig. 1). An incision was made to as deep as the periosteum of the nasal bone. The elevation of the flap normally begins on one side (Fig. 2) and proceeds to the opposite border. To protect the lateral border of the flap, which serves as a pedicle, the skin was incised over its line, always keeping the incision superficial. The skin was then elevated, while preserving the subcutaneous tissue. Once the flap was movable, it was moved into the defect. The basic prerequisite for the success of the flap is to avoid any tension; otherwise, the microcirculation may be compromised and the pedicle will fail to survive. A meticulous two-layer closure was performed (Fig. 3). The donor defect was closed in a V–Y fashion.

Results and analysis

Twenty-two patients were treated for skin cancer of the nasal dorsum region. In all patients, an island nasal flap was used immediately after excision of the tumor (Figs 4–8). Six patients (27.3%) had squamous cell carcinoma and 16 (72.7%) had



Figure 1 Skin defect after tumor removal. The flap is outlined over the region of the procerus muscle near the defect



Figure 2 Elevation of the flap

basal cell carcinoma. The size defect after tumor excision was in the range 15–38 mm in diameter (average, 24.8 mm). There was no total or partial flap loss. After tumor ablation, the free margins were confirmed by microscopic examination.



Figure 3 Island composite flap fixed in place



Figure 4 Skin tumor of the medial plane of the nasal dorsum



Figure 5 Postoperative result after removal of the tumor and reconstruction of the defect by means of an island composite flap



Figure 6 Skin tumor on the left lateral border of the nose



Figure 7 Skin defect after tumor removal



Figure 8 Postoperative result. An island composite flap has also been employed here

None of the patients has since suffered from recurrence of the tumor. The final aesthetic result was acceptable in all patients.

Discussion

Skin defects on the nasal dorsum remain a challenge for the plastic surgeon. There are a few options for the repair of proximal nasal skin defects by means of local, i.e. nasal, cutaneous flaps. They include the banner flap, the bilobed flap, the V-Y advancement triangular flap (placed laterally to the removed lesion), and the dorsal nasal flap.^{2,6,7} Paranasal skin flaps are technically useful for these procedures, but the color of the flap, texture match, and scars of the donor site are not always optimal for proximal nasal skin defects.⁸

The island composite nasal flap is a reliable technique for defect closure. The flap is moved directly forward into a defect without any rotation or lateral movement and with minimal tension. This flap is a musculocutaneous flap vascularized in the vast majority of patients by the dorsal nasal artery, which is the terminal branch of the ophthalmic artery.⁴ It can occasionally also be vascularized by the lateral nasal artery, which is a branch of the angular artery.⁹ The first part of the term “musculocutaneous” refers to the procerus and the compressor nasi muscle, which protects the overlying vascular pedicle during dissection; however, clear identification of this artery is not necessary.

The optimal use of the island composite nasal flap is to repair proximal nasal skin defects with diameters as large as 30 mm. It can be advanced superiorly, inferiorly, or laterally, depending on the situation and the position of the defect. Complications are rare with an appropriate surgical technique

and concern partial, mostly marginal, demarcations or even mummifications of the flap, or, extremely rarely, the total mummification of the flap. We encountered no complications in our patients.

Conclusions

The island composite nasal flap is a reliable technique for the closure of proximal nasal skin defects. Complications in the elevation of the island composite flap are rare, and the final result is acceptable.

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