Journal of Plastic, Reconstructive & Aesthetic Surgery (2016) 69, 1280–1284

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

Double forehead flap reconstruction of composite nasal defects

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Received 21 March 2016; accepted 22 May 2016

KEYWORDS
Forehead flap;
Nasal reconstruction;
Rhinoplasty;
Skin cancer

Summary *Background and aim:* Composite nasal defects require skin, framework, and lining reconstruction. The forehead flap is an ideal donor for skin coverage because of good color match and excellent donor-site healing. Intranasal flaps and grafts are reserved for lining reconstruction of small defects. Locoregional and free flaps are used for larger lining defects, but these may not be ideal or safe. The authors advocate the double forehead flap for large composite defects of the nose in a subset of patients.
Methods: Three men and three women aged 55–87 years (average 74.7 years) were treated for composite nasal defects that resulted from cancer ($n = 5$) and trauma ($n = 1$). Skin and lining defects were >2 cm in every dimension. Double forehead flaps were raised in stages ($n = 1$) or simultaneously ($n = 5$), and nasal reconstruction was performed in two ($n = 1$) or three stages ($n = 5$).
Results: Patients were followed for 19.3 months (range 13–24 months). Donor sites of flaps raised in stages healed after 3 months. When flaps were raised together, healing required 5–13 months (average 7.6 months). There were no partial or complete flap losses. None of the patients had infection, hematoma, or nerve injury. Satisfactory aesthetic results were achieved in every case.
Conclusion: The authors advocate the double forehead flap for large composite nasal defects in patients who are not suitable candidates for nasolabial flaps and those who may not tolerate free tissue transfer. The advantages of this method must be weighed against the drawbacks, which include prolonged donor-site healing and elimination of the contralateral forehead flap.

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http://dx.doi.org/10.1016/j.bjps.2016.05.026

Introduction

The nose is a psychologically significant central facial structure with intricate aesthetic and functional features. Unique shadows and contours of the nasal dorsum are found nowhere else on the body; full-thickness defects must be rebuilt from scratch. Three specialized layers, lining, skeleton, and skin, must be restored as thin as possible to maintain airway patency and achieve an acceptable aesthetic result.[1–3] Full-thickness nasal defects are challenging because the aesthetic demands of nasal skin resurfacing and the functional demands of lining replacement are stringent. When local flaps and grafts are inadequate, the forehead is a dependable option for dorsal resurfacing because of its reliability and anatomic likeness to nasal skin.[2,4]

The choice for lining replacement is not as straightforward. Traditional methods for lining reconstruction range from skin grafting to free flaps, with each option having its advantages and limitations.[5] The forehead flap is a well-known option for lining replacement because it is thin and pliable, and the donor site is tolerant to healing by secondary intention. However, for full-thickness injuries, the forehead is traditionally reserved for skin cover. In some cases, the flap can be folded to recreate the lining, sparing the contralateral forehead flap for recurrence in oncologic reconstruction, or salvage. When the lining defect is extensive, traditional options such as intranasal lining flaps will not suffice. Free tissue transfer is a good option,[1,3,6,7] but the contralateral forehead flap should not be overlooked.

Reconstruction of the nose is the priority of the authors. Although there are limitations, the authors endorse composite nasal reconstruction using paired forehead flaps[8] for sizeable full-thickness defects of the nose in patients who cannot tolerate or choose not to undergo nasolabial or free flap lining reconstruction. The authors present the indications, surgical technique, and rationale for paired forehead flap reconstruction of composite nasal defects.

Patients and methods

Three men and three women aged 55–87 years (average 74.7 years) presented with large composite nasal defects following trauma in one case and tumor extirpation in five (Table 1). Patients were of Taiwanese ethnicity. Their skin defects ranged from 2.5 × 3 to 7 × 6.5 cm, and their lining defects ranged from 2 × 2 to 3 × 3 cm. Informed consent was obtained before the patients underwent treatment. Five patients had medical comorbidities including hypertension (four cases), diabetes mellitus type II (one case), cirrhosis (one case), and Parkinson's disease (one case).

Indications (Table 2)

Patients included in this series had lining defects >2 cm in every dimension. Patients of advanced age and those with medical comorbidities who were not ideal candidates for free flap reconstruction were selected for this operation. Alternatively, patients who refused free flaps or other regional flaps because of donor-site functional or aesthetic

Table 1 Patient demographics and outcomes.

Age/sex	Comorbidities	Etiology	Subunit involvement	Skin defect, cm	Lining defect, cm	Flap harvest staging	Additional flap	Framework grafts	Donor defect, cm	Follow-up, months	Donor-site healing, months
57/M	ESLD	BCC	Left cheek, sidewall, dorsum, ala	7 × 6.5	3 × 3	Two stages	cheek advancement	costal	3 × 3 (lining) 3 × 3 (cover)	34	3
81/F	HTN	BCC	Right sidewall, dorsum, ala	2.5 × 3	2 × 3	Single stage	cheek advancement	septal and conchal	7 × 8	25	8
84/M	HTN	BCC	Left sidewall, dorsum, ala	3.5 × 2.5	2.5 × 3	Single stage	cheek advancement	conchal	8 × 10	20	6
87/M	HTN	BCC	Bilateral sidewall, ala, dorsum, tip	3.5 × 3	2 × 2	Single stage	—	conchal	7 × 10	24	13
55/F	—	Trauma	Left sidewall, ala, tip	4 × 3	2 × 3	Single stage	—	conchal	8 × 9	13	5
84/F	PD, HTN, and DM	BCC	Right lower eyelid, cheek, lip, sidewall, ala, dorsum, tip, columella	6 × 6	2.5 × 3	Single stage	cheek advancement	conchal	8 × 9	12	6

ESLD, end-stage liver disease; HTN, hypertension; PD, Parkinson's disease; DM, diabetes mellitus type II; BCC, basal cell carcinoma.