



Aesthetic Reconstruction in Nose and Perinasal Cheek with Reverse Facial Artery Perforator Flap after Skin Cancer Excision

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Abstract

Aesthetic reconstruction of the nose or Perinasal cheek area after skin cancer excision is always challenging. The good skin color and texture match, invisible scars, avoiding or minimizing functional deficits, and preventing disfigurement in the surrounding tissue were needed. We elevated the reverse facial artery perforator flaps from the nasolabial area and reconstructed nose and cheek area aesthetically in patients with skin cancers. The reverse facial artery perforator flap has the advantages of reliable blood supply, minimal donor site morbidity and has a wide range of transfer. We believe that the reverse facial artery perforator flaps are reliable options of nose or perinasal cheek area in skin cancer reconstruction.

Keywords: Reverse facial artery perforator flap; Aesthetic reconstruction; Skin cancer

Introduction

The facial artery anatomy has been well documented in recent studies. The facial artery has reliable perforators in the nasolabial area. This artery is connected to maxillary artery caudally and angular artery cranially and has sufficient circulation. The nasolabial skin is similar to the nose or perinasal cheek area in color and texture. After skin cancer excision in the nose or perinasal cheek area, aesthetic and immediate reconstruction is important because this midfacial area is an social exposed surface of the face [1]. Random pattern skin flaps such as the bilobed or Limberg flaps are commonly used options for reconstruction, providing with a similar tissue, but its range of transfer is limited and donor sites may have dog ear deformity. So sometimes a secondary surgery may be required. The facial artery perforator flaps in the nasolabial area overcomes these problems. Especially when a reverse facial artery perforator flap is elevated, range of transfer is expanded close to midline nose easily. Also, the donor site scar is hidden in the nasolabial fold.

Patients and Methods

From January 2016 to December 2016, 10 cases of aesthetic reconstructions using the reverse facial artery perforator flap were performed in skin cancer patients (Table 1). After wide excision of the skin cancer, perforator mapping was performed in the nasolabial area using 8 MHz hand held Doppler ultrasound device. A reliable perforator was detected usually in the middle of the nasolabial fold. All of the flaps were designed to have single facial artery perforator. Accurate skin incisions were made according to the corresponding skin defect after wide excision and the perforator was skeletonized to the source artery.

A reverse flow facial artery perforator flap from angular artery was elevated to achieve a long pedicle in nose reconstructions. The angular artery circulation was traced with Doppler ultrasound (Figure 1A), and the vessel clamp was applied at the proximal portion of the facial artery. When retrograde perfusion was confirmed in the skin paddle, the facial artery was cutter at the clamping area. Source artery skeletonization was continued to cranially to the angular artery through the skin incision (Figure 1B and 2A). After the reverse flow facial artery perforator flap was elevated, a tunnel was made to transfer the flap to the reconstruction site (Figure 1C). When the skin paddle was too large to pass through the tunnel, a skin incision was made to avoid pedicle torsion or kinking (Figure 2B). All donor site scars were hidden in the nasolabial fold (Figure 2C) and all stitches were

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Figure 1A: Wide excision was performed and 2 cm × 1.5 cm sized round defect was seen in the left nostril sill. Angular artery pulsation was detected first and facial artery perforator mapping was done in the nasolabial fold. Tailor-made flap design was made according to the defect size and shape.

Figure 1B: Reverse facial artery perforator flap elevation. Skin incision was made on the design and facial artery perforator skeletonization was continued. When facial source artery was found, vessel clamp was applied at the caudal portion of the flap of the facial artery to interrupt the anterograde flow. We confirmed the reverse flow circulation at the skin paddle; we cut the proximal facial artery at the clamp area. Reverse facial artery perforator flap was elevated and pedicle dissection was continued to angular artery cranially.

Figure 1C: Tunnel was made and the flap was transferred to the nostril sill easily. Donor site was repaired directly and the scar was hidden in the nasolabial fold.

Figure 1D: Postoperative 6 month's view.



Figure 2A: Reverse facial artery perforator flap was elevated.

Figure 2B: The flap was too large to pass the tunnel; skin incision was made to transfer to nasal dorsum.

Figure 2C: Donor site scar was hidden nasolabial fold.

Figure 2D: Postoperative 2 month's view.

removed within postoperative 7 days (Figure 1D and 2D).

Results

From January 2016 to December 2016, 10 cases of aesthetic reconstructions using the reverse facial artery perforator flap were performed in skin cancer patients. Average age of the patients was 65.5 years. About 7 cases were diagnosed as basal cell carcinoma and 3 cases were squamous cell carcinoma. The average size of the reconstructed defects was 2.6 cm × 1.9 cm. The entire flaps were a single perforator based flap and survived without any specific problem. In the 10 cases of reverse facial artery perforator flap surgeries, flap loss is not happened.

Discussion

In skin cancer reconstruction, a small defect in nose and perinasal cheek is aesthetically important for good social relationship [1]. Reconstruction with adjacent tissue is needed for similar skin texture. Various local flap techniques were used, such as rotation flap, VY advancement flap, bilobed or Limberg flaps. However, its range of transfer is limited and donor sites may have dog ear deformity. So sometimes a secondary surgery may be required. Actually, these flaps are supplied by the facial artery perforators and existed in facial artery perforasomes [2]. Since Koshima and Soeada introduced the concept of perforator flaps, it has been applied to reconstruct many areas of the body [3]. In aesthetically important nose and perinasal cheek area, the facial artery is a main source artery and its anatomy is well documented. In Camuzard's anatomic study, the average number of facial artery perforators between mouth angle and zygomatic process of maxilla is 1.42 (a diameter greater than 0.5 mm) [4]. Since Hofer's

description concerning nasolabial flap in 2005, facial artery perforator flap reconstruction in nose or perinasal area is increased [5].

As microsurgical techniques advanced, various techniques of nasolabial flap elevation and transfer to perinasal area was possible. At some reports, facial artery perforator dissection has been well described and facial artery myomucosal flap also showed excellent results in perioral mucosal reconstruction [4,6-10]. These reconstructions were based on anterograde facial artery perfusion. However, when the reconstruction area is relatively small and close to the midline nasal area, sometimes this anterograde flow facial artery perforator flap transfer can be difficult due to short pedicle length. Because the facial artery is connected to angular artery cranially, this perforator flap has reverse circulation from angular artery-facial artery system. In our nasal reconstruction cases, reverse facial artery perforator flaps with retrograde facial arterial perfusion were elevated. This reverse facial artery perforator flap technique gives us freedom to reach the nasal dorsum and to pass through the tunnel around perinasal defect easily. In our 10 reverse facial artery perforator flap cases, retrograde perfusion was always confirmed after proximal facial source arterial clipping, and all flaps survived based on single perforator. Reverse flow facial artery has reliable circulation and it was already used as a recipient pedicle in perforator flap reconstruction [11]. We think that both anterograde and retrograde flow facial artery perforator flap is a good option for reconstructing the nose and perinasal cheek. Especially, the reverse facial artery perforator flap expands the range of nasolabial flap transfer to the nose. Improved aesthetic and functional outcomes can be obtained with a freestyle facial flap design. This technique also can hide the donor site scar in the nasolabial fold.

Table 1: Summary of Clinical Details of the Reconstructed Flap.

No	Gender	Age	Pathology	Area	Size (cm ²)	Method of Transfer	Complication
1	F	57	BCC	Nasal Ala	3 × 2.5	Island	None
2	F	58	BCC	Nostril Sill	2 × 1.5	Island, Tunneled	None
3	F	75	SCC	Nasal Dorsum	4 × 3.5	Island	None
4	F	54	SCC	Nasal Dorsum	2 × 2	Island	None
5	F	77	SCC	Nasal Dorsum	2 × 1.5	Island	None
6	M	65	BCC	Nasal Ala	2 × 1.5	Island	None
7	M	68	BCC	Nasal Dorsum	5 × 2.5	Island	None
8	F	66	BCC	Nasal Ala	2 × 1	Island, Tunneled	None
9	M	63	BCC	Nasal Dorsum	3 × 2.5	Island	None
10	F	72	BCC	Nasal Ala	1.5 × 1.5	Island, Tunneled	None

M: Male; F: Female; BCC: Basal Cell Carcinoma; SCC: Squamous Cell Carcinoma

References

- Meara DJ. Acquired defects of the nose and naso-orbitoethmoid (NOE) region. *Oral Maxillofac Surg Clin North Am.* 2013;25(2):131-49.
- Saint-Cyr M, Wong C, Schaverien M, Mojallal A, Rohrich RJ. The perforasome theory: vascular anatomy and clinical implications. *Plast Reconstr Surg.* 2009;124(5):1529-44.
- Koshima I, Soeda S. Inferior epigastric artery skin flaps without rectus abdominis muscle. *Br J Plast Surg.* 1989;42(6):645-8.
- Camuzard O, Foissac R, Georgiou C, Andot L, Alcaraz F, Baqué P, et al. Facial artery perforator flap for reconstruction of perinasal defects: An anatomical study and clinical application. *J Craniomaxillofac Surg.* 2015;43(10):2057-65.
- Hofer SO, Posch NA, Smit X. The facial artery perforator flap for reconstruction of perioral defects. *Plast Reconstr Surg.* 2005;115(4):996-1003.
- D'Arpa S, Cordova A, Pirrello R, Moschella F. Free style facial artery perforator flap for one stage reconstruction of the nasal ala. *J Plast Reconstr Aesthet Surg.* 2009;62(1):36-42.
- Durgun M, Ozakpinar HR, Sari E, Selçuk CT, Seven E, Tellioglu AT. The Versatile Facial Artery Perforator-Based Nasolabial Flap in Midface Reconstruction. *J Craniofac Surg.* 2015;26(4):1283-6.
- Sarici M, Yesiloglu N, Temiz G, Sirinoglu H, Güvercin E, Filinte GT. Facial Artery Perforator and Depressor Anguli Oris Muscle Chimeric Flap: A New Design of an Old Flap. *Ann Plast Surg.* 2016;77(2):178-82.
- Yoon TH, Yun IS, Rha DK, Lee WJ. Reconstruction of various perinasal defects using facial artery perforator-based nasolabial island flaps. *Arch Plast Surg.* 2013;40(6):754-60.
- Kim SW, Kim YH, Kim JT. Angular artery perforator-based transposition flap for the reconstruction of midface defect. *Int J Dermatol.* 2012;51(11):1366-70.
- Hölzle F, Hohlweg-Majert B, Kesting MR, Mücke T, Loeffelbein DJ, Wolff KD, et al. Reverse flow facial artery as recipient vessel for perforator flaps. *Microsurgery.* 2009;29(6):437-42.