

Case Report

Median forehead flap - beyond classic indication

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Abstract

Introduction. The paramedian forehead flap is one of the best options for reconstruction of the median upper two-thirds of the face due to its vascularity, color, texture match and ability to resurface all or part of the reconstructed area. The forehead flap is the gold standard for nasal soft tissue reconstruction and the flap of choice for larger cutaneous nasal defects having a robust pedicle and large amount of tissue.

Materials and Methods. We are reporting a clinical series of cutaneous tumors involving the nose, medial canthus, upper and lower eyelid through a retrospective review of 6 patients who underwent surgical excision of the lesion and primary reconstruction using a paramedian forehead flap.

Results. The forehead flap was used for total nose reconstruction, eyelids and medial canthal reconstruction. All flaps survived completely and no tumor recurrence was seen in any of the patients. Cosmetic and functional results were favorable.

Conclusions. The forehead flap continues to be one of the best options for nose reconstruction and for closure of surgical defects of the nose larger than 2 cm. Even though is not a gold standard, median forehead flap can be an advantageous technique in periorbital defects reconstruction.

Keywords: forehead flap, periorbital defects reconstruction, nose reconstruction



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Introduction

The forehead flap is considered the gold standard for nasal soft tissue reconstruction because of its vascularity, texture and color matching (1). The success of the flap is due to its vascularity formed of the supraorbital, supratrochlear and terminal branches of the angular and dorsal nasal arteries (2). Necrosis of the flap rarely occurs and this is due to excessive tension of the pedicle or flap thinning (1). The paramedian flap has a narrow pedicle which includes the supratrochlear artery and vein and confers a large arc of rotation (2).

Frequently nasal defects occur in association with periorbital defects which represent a surgical challenge. Reconstruction of the medial canthus and eyelids requires ocular protection, patency of the lacrimal drainage system, function of the eyelid and aesthetic outcome (3). Defects of the periorbital area which cannot be repaired using a local flap or are too small for using a free flap might be covered using a forehead flap (4), even though is not considered a popular technique.

In this paper, we report six clinical cases in which paramedian flaps were used for reconstruction of the nasal and periorbital defects.

Materials and Methods

This is a retrospective review of six patients who underwent surgical excision of face carcinomas involving the nose and periorbital area. Periorbital defects were considered the defects involving the medial or lateral canthus and the upper or lower eyelid. The reconstruction of the defects was realized using a paramedian forehead flap with a narrow pedicle and a rich blood supply from the supratrochlear artery and vein.

Preoperatively we identified by digital palpation and by Doppler hand held probe examination the supratrochlear vessels and we measured the dimension of the defect and the flap. We excised the tumor with 0.5 cm margins in order to have a free tumor defect (5, 6). The flap was created on the opposite side and the size is decided after measuring the dimensions of the defect with a length measured from the distal site of the defect to the base of the flap, having the hairline as limitation and a base of maximum 1,5cm for easy mobility without strangulation (7). The flap is harvested superficial to the frontalis muscle in the distal part and together with this muscle close to the periosteum, in the proximal part, in order to protect the vessels (7). After harvesting, the flap can be thinned in order to match the thickness of the tissue from the defect. The flap is sutured on the defect and the donor site is closed near the midline.

Results

All excised tumors were basocellular carcinomas, nodular-infiltrative with ulceration in four cases and nodular in two cases.

Tumors were completely excised, clear resection margins being confirmed in histopathological examination. In all cases the main method of reconstruction was the paramedian forehead flap, and in one case, where the tumor involved also a part of the cheek, a Mustarde cheek advancement flap was associated. Two cases required reconstruction of the dorsal and lateral part of the nose associated with medial canthus (Figure 1, 2), one case a reconstruction of the upper eyelid (Figure 3), one of the lower eyelid and another one with a lower eyelid and medial canthus reconstruction. No reconstruction of the lachrymal system was done, and the donor site was closed primary in all patients.



Figure 1. Basocellular carcinoma of medial canthus and dorsal part of the nose

Figure 2. Day 10 after reconstruction of the dorsal and lateral part of the nose and medial canthus



Figure 3. Reconstruction of the upper eyelid after resection of a basocellular carcinoma



Figure 4. Basocellular carcinoma involving the medial canthus and lower eyelid

Figure 5. Reconstruction of the medial canthus and lower eyelid without ectropion

There were no postoperative complications as infections and hematomas and no patients experienced flap failure. In patients where medial canthus was reconstructed a common sequela was considered

epiphora, occurred because the lachrymal system was not restored. Eyelid closure was adequate and no ectropion occurred, the patients being satisfied with their functional and cosmetic results (Figure 4, Figure 5). Follow-up revealed no evidence of recurrence.

Discussion

Periorbital defects are difficult to reconstruct, being necessary to provide a stable eyelid margin with an adequate eyelid closure for corneal protection, to provide symmetry with smooth internal surfaces and to restore normal tension for maximal function (8). At the same time is also important to provide a good aesthetic quality at the donor site (9). Various local flaps can be used in periorbital defects reconstruction depending on the size and location, sometimes being limited due to tissue availability (8). Paramedian forehead flap might be considered of the most suitable options for reconstruction of small and medium periorbital defects, having a rich vascular supply and low complication rate and providing a good cosmetic result because of skin color, texture and structural characteristics (8). Another advantage is considered the axial vascularization which does not require any microvascular surgical techniques (10).

The proximity and large arc of rotation confers the possibility to cover large defects without tension and also to reconstruct a stable margin of the eyelid. There are also disadvantages of the forehead flap like donor site scar and the thickness of the flap which could be avoided by careful perioperative debulking (10).

We have used the paramedian flap in reconstructing medium-sized periorbital defects and also periorbital defects associated with nasal defects. One of the areas difficult to reconstruct was considered the medial canthus because of its specialized anatomy including medial canthal ligament, lachrymal sac and lachrymal duct, its damage causing an inevitable complication as epiphora (3). We have used a single

staged surgery reducing the patients anxiety for a second surgery and offering the possibility to recover faster (11).

The donor area did not required closure by using a skin graft and the scar was acceptable, being oriented vertically and aligned with the medial brow. The functional and aesthetic outcome was satisfactory with no cases of hypertrophic or keloid scars.

Conclusions

Reconstruction of the periorbital and nose area is very important, having a wide range of surgical options. Despite the aesthetic outcome, these areas have a functional importance for a successful recovery of the patient. The reconstruction plan using local and regional flaps is chosen considering the location of the defect, the size and the age of the patient (12).

Considering the excellent match of color, texture and structural characteristics, the predictable cosmetic outcome and the excellent functional result, the forehead flap is considered the best solution for reconstructing nasal defects. Because of the proximity, the large arc of rotation, the good vascularity with a decreased failure rate and hair free pedicle the paramedian forehead flap might be a good option for achieving functional and aesthetic result in reconstructing periorbital defects.

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