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Propeller facial artery perforator flap as first reconstructive option for nasolabial and perinasal complex defects

A. Ruiz-Moya [a,*], A. Lagares-Borrego [a], P. Infante-Cossío [b]

[a] Department of Plastic and Reconstructive Surgery, Virgen del Rocío University Hospital, Seville, Spain
[b] Department of Maxillofacial and Oral Surgery, Virgen del Rocío University Hospital, Seville, Spain

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Summary Facial cutaneous oncological pathology often involves more than one esthetic unit due to their close boundaries. The reconstruction of both the nasolabial and perinasal regions may be especially complex and challenging for the surgeon. Traditionally, these defects have been reconstructed with local random flaps based on the vascularization provided by the superficial musculoaponeurotic system.

In this article, we present our experience in the reconstruction of the aforementioned defects using the propeller facial artery perforator (FAP) flap.

Patients and methods: A propeller FAP flap was performed for reconstruction in 12 patients with nasolabial or perinasal complex defects after tumoral resection between the years 2011 and 2013. The flap was designed parallel to the nasolabial fold in all cases for achieving direct closure and an aesthetically pleasing outcome. In one of the cases, a paramedian forehead flap was performed simultaneously.

Results: Nine patients healed uneventfully, with good functional and esthetic outcomes. One of the flaps developed partial necrosis of the distal end, and another developed temporary postoperative venous congestion, lymphedema, and, finally, trapdoor deformity. The latter complication also occurred in one more flap.

Conclusion: The propeller FAP flap is reliable and versatile, with few complications, and it is especially useful when reconstructing complex defects that involve the nasolabial and perinasal regions; therefore, it should be considered as one of the first reconstructive options for the described defects.

* Corresponding author.
E-mail address: dr.ruizmoya@gmail.com (A. Ruiz-Moya).

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The reconstruction of defects involving the nasolabial and perinasal regions may be particularly challenging, because they often involve more than one esthetic unit of the face due to their close boundaries, and because the aim of the surgery is achieving both functional and aesthetically pleasing cosmetic outcomes. In most of the patients, the defects are the consequence of oncologic resection surgery.

In these particular facial regions, direct closure is hardly ever the best choice, so the traditional approach for such defects has been closing them with either local random flaps based on the vascularization of the superficial musculoaponeurotic system (transposition flaps, V—Y advancement or island nasolabial flaps, etc.) or axial-pattern flaps (paramedian forehead flaps).[1–5] These flaps have the advantage of replacing like-for-like tissue in a region as sensitive to asymmetries as the face. However, both their availability and movement are often limited, and sometimes when pedicled, they require a second surgical procedure.

With the onset of the era of perforator flaps,[6] a world of new possibilities have opened up for the reconstructive surgeon. In 2005, the first description of the facial artery perforator (FAP) flap was reported by Hofer et al.,[7] attempting to obtain more mobility and to recruit more tissue in a single-stage surgical procedure.

Here, we describe our experience and present our results in the reconstruction of nasolabial and perinasal complex defects involving several esthetic units, using the propeller FAP flap.

Patients and methods

Between January 2011 and February 2013, 12 patients underwent surgery in our department for excision of tumors involving the nasolabial and perinasal regions, comprising more than one esthetic facial unit. The resulting defects were reconstructed with propeller FAP flaps rotated from 120° to 180°.

Out of the 12 patients, seven were males and five females, with a mean age of 70.2 years (ranging from 53 to 82). Three of these patients smoked tobacco regularly prior to surgery, and one had received radiotherapy on the surgical area during childhood. Patients were followed up for an average duration of 13.8 months (ranging from 12 to 18 months).

The anatomopathological analysis of the resected lesions revealed nine basal cell carcinomas (one of them metatypical) and three squamous cell carcinomas.

After resection with oncologic margins, the resulting defects involved only the nasolabial region in four patients, the nasolabial region and nasal ala in five patients, the nasolabial region and upper lip in two patients, and the nasal region and upper lip in the last patient (Table 1). In the latter, a paramedian forehead flap was performed simultaneously with a propeller FAP flap, for total nasal reconstruction after resection of a squamous cell carcinoma arising from a chronic radiodermatitis.

Surgery was performed under local anesthesia in eight patients, and under general anesthesia in four patients.

Surgical technique

First, complete resection of the lesions with oncologic margins was performed (Figure 1A). Second, a propeller FAP flap was designed according to the size of the defect, with its skin paddle placed over the theoretical course of the facial artery, and with its medial edge placed at the melolabial crease, simultaneously trying to obtain the best esthetic outcome hiding the scar and recruiting tissue from the medial cheek.

Dissection is performed with the aid of 2.5× magnification loupes. Dissection was started with an exploratory incision through the skin and the entire subcutaneous tissue at the medial border of the flap, in an attempt to identify the FAPs (Figure 1B). Once a perforator was chosen according to its caliber and location, dissection of the lateral aspect was completed. The pedicle should not be skeletonized in excess, leaving a shaft of adipose tissue surrounding it (Figures 1C and 2), not only for protection but also in order not to constrict venous and lymphatic outflow, which may be disturbed when this fibrofatty tissue is heavily trimmed.

Eventually, the propeller FAP flap was rotated to a maximum of 180°, and primary closure of the donor site was accomplished (Figure 1D).

Results

Of the 12 flaps, 11 survived completely. One developed partial necrosis of its distal third, which healed by secondary intention, in a patient with chronic radiodermatitis of the middle facial third.

Another flap developed venous congestion during the immediate postoperative period (Figure 3), which resolved spontaneously during the next week without necrosis.

Excellent functional and esthetic late outcomes were achieved (Figure 1E), with unsightly hidden scars, preserved oral and external nasal valve competence, and without paresis of the branches of the facial nerve. However, in the late postoperative period, two flaps developed trapdoor deformity, one of which had developed venous congestion during the immediate postoperative period. This flap also developed malar lymphedema, which, although improved over time, did not completely disappear (Figure 3E).

Discussion

The face is divided into esthetic units with close boundaries between them. Defects generated after the surgical removal of tumors may affect more than one of them simultaneously. The main goals of every reconstructive procedure are to preserve function while achieving the best possible esthetic outcome. Defects involving the nasolabial and perinasal regions are particularly challenging.

Melolabial local random or axial-pattern flaps, or the frontal paramedian forehead flap[1–5] have traditionally been employed to reconstruct these defects, recruiting tissue in the form of V—Y advancement, transposition, and