

Complex nasal reconstruction using the combination of bilateral hinge flaps and frontal paramedian flap after Mohs surgery

Reconstrução nasal complexa com combinação de retalhos bilaterais em dobradiça e retalho paramediano frontal, após cirurgia de Mohs

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ABSTRACT

The reconstruction of nasal surgical defects, especially when there is total thickness bilateral simultaneous involvement of the nasal ala, tip, and dorsum, is complex. Several surgical options are described, and most authors recommend ear cartilage graft or chondro-mucous flap of the nasal septum, associated with the frontal median flap in order to lend structural rigidity to the nasal ala, preventing it from collapsing during inspiration. The authors describe an alternative reconstruction technique without the use of cartilage through the combination of hinge flaps from the nasogenian fold, associated with a frontal paramedian flap.

Keywords: Mohs surgery; carcinoma, basal cell; nose neoplasms; surgical flaps; nasal cartilages

RESUMO

Reconstrução de defeitos cirúrgicos nasais, especialmente quando há comprometimento simultâneo, de espessura total de asa nasal bilateral, ponta e dorso nasal, é complexa. Várias opções cirúrgicas são descritas, e a maioria dos autores recomenda enxerto de cartilagem de orelha ou retalho condromucoso de septo nasal, em associação ao retalho médio frontal, para conferir rigidez estrutural à asa nasal e impedir que se colapse durante a inspiração. Os autores descrevem uma alternativa de reconstrução, livre de cartilagem, por meio da combinação de retalhos em dobradiça a partir do sulco nasogeniano, associado ao retalho paramediano frontal.

Palavras-chave: cirurgia de Mohs; carcinoma basocelular; neoplasias nasais; retalhos cirúrgicos; cartilagens nasais

Introduction

The incidence of skin cancer in the nose is high, with basal cell carcinoma (BCC) being the most prevalent.^{1,2}

In addition to its olfactory function, the nose allows the passage of air to the upper airways, filtering and moistening the air, furthermore it has an important role in the phonation. Cosmetically, the nose is divided into subunits according to the local characteristics of each area, namely: the nasal tip, the nasal ala, the columella, the sides of the nose, the nasal dorsum and the glabella.^{1,3}

Recurred tumors or of aggressive histological subtype can have great subclinical extension and affect deep structures, such as bone and cartilage, causing great functional and cosmetic damage to the patient.^{4,5}

New Techniques

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Several treatments are described for the BCC, and due to the high accuracy of the histological control of surgical margins, the Mohs micrographic surgery is the method of choice for aggressive or recurrent tumors, since it has a better chance of cure with the lower recurrence rates^{4,6}— and with the additional advantage of sparing the justatumoral healthy tissue.^{4,6}

Extensive infiltrative tumors can affect the cartilage of the nasal ala, causing its transfixing or full amputation, along with the nasal tip, leading to complex surgical defects.^{4,7} Surgical repair of such defects is challenging, especially due to the fact that it requires that the used technique lends sufficient structural stability to overcome the lack of alar cartilage and the collapse of the nasal ala during inspiration.^{4,7}

The paramedian frontal flap, first described in India, has been used for centuries in the reconstruction of the distal third of the nose,⁷ while the use of ear helix or auricular concha grafts is classically described in association with the paramedian flap,^{4,7} aimed at promoting adequate support when there is total or partial amputation of the nasal ala.⁷ In 1902, De Quervain⁸ described the use of the chondro-mucous hinged-door composite nasal septum flap for the reconstruction of the nasal lining and lateral wall. Kazanjian and Converse⁹ have demonstrated the use of septal tissues for restoring the nasal lining.

Although most articles recommend the use of cartilage, the authors of the present article argue that even when extensive and full thickness nasal ala defects occur, with partial loss of the alar cartilages, the use of cartilage flaps or grafts aimed at providing structural support to the nasal ala is not always imperative.

The present article describes an option that does not use cartilage in the total reconstruction of the nasal ala, tip and dorsum, through the combination of a paramedian flap associated with a bilateral hinged-door flap, originating in the nasogenian fold.

Methods

An 83 year-old male patient with infiltrating basal cell carcinoma that had recurred twice, in the nasal dorsum, was selected for Mohs micrographic surgery. The lesion measured approximately 3 x 2 cm, extending towards the lateral regions of the nose and malar bilaterally (Figure 1). Free margins were obtained after four expansion phases, with involvement and bilateral partial loss of the alar cartilages (Figure 2), and transfixion of the nasal ala and mucosa, as well as loss of the nasal dorsum and part of the nasal tip (Figures 3 and 4).

The first step is aimed at reconstructing the mucosa lining of the nasal alae through the bilateral preparation of hinged-door flaps, originating in the nasogenian folds. These flaps are drawn by measuring size of the defect to be covered, simulating the desired slope of the nasal ala with a piece of gauze. The flap is detached from the nasogenian fold, leaving a thick subcutaneous pedicle in its proximal portion to ensure the vascularization of the flap's distal portion (Figure 5). The flap's face, covered with epidermis, is folded over itself, and its distal portion is sutured to the remaining nasal septum, forming a tent, which allows the passage of air and will originate the internal



FIGURE 1: Twice-recurred infiltrating basal cell carcinoma, previously operated with a conventional technique at another dermatological service



FIGURE 2: Total thickness surgical defect in the nasal alae, after four Mohs micrographic technique stages of margins expansion, with partial loss of the alar cartilage



FIGURE 3: Final surgical defect with partial loss bilateral of the nasal alae and exposure of the nasal bone

part of the nasal ala (Figure 6). The donor area in the nasogenian fold is sutured primarily. The next step consists of reducing the defect of the paranasal malar region and of the lateral walls of the nose, which is done with the simple displacement of the malar region's skin and suture in the lateral nasal wall's periosteum.



FIGURE 4: Marking of the paramedian frontal flap and preparation of the hinged-door flap of the left nasogenian fold



FIGURE 5: Bending the flap from the nasogenian fold for the reconstruction of the nasal mucous lining. The distal part of the hinged-door flap is sutured to the remaining nasal septum. Note that the flap's vascular pedicle is mainly originating from the branches of the angular artery that nourish the subcutaneous tissue in this region



FIGURE 6: Immediate postoperative period: suture of the nasogenian folds after the positioning of the bilateral hinged-flaps. Paramedian flap with thick pedicle and frontal region partially sutured. The distal donor region in the front is left to heal by secondary intention

The following step is aimed at constructing the paramedian flap. The defect to be covered with the flap is measured with a gauze from its base, which is located in the upper area of the medial portion of the eyebrow. The size of a flap capable of completely covering the nose's defect is estimated with the rotation of the gauze towards the frontal region. The flap – that must cover the nose – is drawn according to the shape of the surgical defect¹⁰ and detached in three different depths in the frontal region (superficial in the distal part, near the hair line; subgaleal in the central part; and supraperiosteal in the proximal portion,¹⁰ beside the vascular pedicle, represented by the supra-trochlear artery.

After the detachment of the flap from the frontal region, it is transposed to cover the surgical wound in the area nasal, ideally with little tension and avoiding excessively bending the vascular pedicle, which would cause ischemia and distal necrosis of the flap. The attachment of the flap is initially performed in the nasal tip by means of simple suture in a way to position and guide the other fixation points. The flap's distal lateral parts are fixed on the hinged-door flaps in order to reconstruct the nasal alae. The donor area and frontal region is sutured primarily in its medial portion; the distal portion located close to the hair line is left to heal by secondary intention.

The flap is left in the position with its vascular pedicle for about three weeks, up until its autonomization. Nasal plugs made of gauze are left in place for seven days.

The flap's viability is checked after three weeks by testing the ischemia of the pedicle, pressing it with a Pean forceps, using a tourniquet or simple digital pressure. If the flap's skin remains flush, this is a sign in what the neovascularization from the receiving area is sufficient to nourish the flap and the pedicle can be sectioned.

The proximal portion of the pedicle is then returned to the original area, in the frontal region. The pedicle's central portion can be discarded along with the remaining excess tissue, with the distal portion being molded on the receiving area aimed at obtaining the best possible cosmetic outcome.

Results

The patient progressed without complications, and the removal of the stitches took place seven days after the autonomization of the flap. The area left to heal by secondary intention (frontal region), epithelized completely in 90 days. Good aesthetic and functional results could be observed 12 months after the surgery (Figure 7).

Discussion

The bilateral hinged-door flaps, with their distal portion sutured in the nasal septum, promote a proper tent effect, allowing the free passage of air through the nostrils. The layout of the tissue, forming a sandwich of skin due to the combination of the hinged-door flap with the medial frontal flap in the region of the nasal alae, sutured to the remaining tissues, promoted adequate structural rigidity, preventing its collapse during inspiration.



FIGURE 7: Twelve-month postoperative. Excellent functional and aesthetic result without signs of tumoral recurrence

Conclusion

The combination of the hinged-door flap of the nasogegenian fold with the paramedian frontal flap can be a good option for the reconstruction of multiple anatomical subunits of the distal portion of the nose, given that it provides adequate structural support, with good functional and aesthetic results, without the need for cartilage grafts. ●

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