

RECONSTRUCTION METHODS OF A DEFECT POSTEXCISION OF A BASAL CELL CARCINOMA ON THE FACE

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Summary

Introduction: Basal cell carcinoma is a malignant skin tumor with a slow growth and a progressive evolution in time. This type of skin cancer has a local aggressive evolution, but it rarely metastasizes.

Case report: We present the case of a 68 year old female with a nodular erythematous structure, with peripheral basal pearls, central telangiectasias, partially pigmented, asymptomatic, with a 1,2 cm diameter.

The tumor was situated in the medial canthus of the nose and had an evolution of approximately 5 years.

We excised the tumor under local anesthesia and we repaired the defect with a rotation flap. The tumor was sent for the histopathological exam, which confirmed the diagnosis of nodular pigmented basal cell carcinoma with negative resection margins. The post surgery evolution was favorable.

Discussions: Repairing post surgery defects resulted after excising different face skin cancers can be realized through multiple methods, considering the size and the location of the tumors. Local flaps are frequently used in face defects reconstruction because their size and location do not permit primary wound closure.

In this article, we will discuss some reconstruction methods which can be used in our patient's case.

Conclusion: Surgical excision remains the best treatment for skin cancers. The purpose of reconstruction is to restore the normal aspect and the functionality of the area with optimal aesthetic benefits.

Key words: basal cell carcinoma, reconstruction, flap, graft.

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Introduction

Basal cell carcinoma (BCC) is the most common malignant tumor seen mostly in the sun-exposed parts over face, head, neck, nose, eyelids, inner canthus of the eyes, but the presence at covered areas is not uncommon. Basal cell carcinoma has an excellent prognosis as it causes local destruction. It has a malignancy through aggression and local invasion, but it has a limited capacity to metastasize and a slow growth.

Some authors concluded that 85% of BCC appear on the face and neck and 25% of these lesions appear on the nose [1].

Therapeutic ways for BCC are multiple, but surgical excision remains the classical method which permits the obtaining of excellent aesthetic results.

The surgical techniques of reconstruction must offer real, functional results and a low rate of reoccurring with optimal esthetic benefits.

Postexcision defects must be repaired with similar tissue regarding structure, size, color,

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laxity, respecting the anatomy and the particularity of the given area.

Starting from a clinical case from our clinic, we remind you the possible surgical means for repairing some similar defects.

Anatomy

A thorough understanding of nasal anatomy is essential to successful nasal reconstruction. Aesthetic reconstruction initially involves assessment of the surface anatomy of the nose, focusing on skin characteristics and contour.

The face can be divided into topographic regions, which include the forehead, cheeks, eyelids, nose, lips, auricles, and sometimes the scalp. Each region has its own characteristic skin color and texture, configuration, contour and hair growth.

The nose is an aesthetic region of the face and can be divided into several aesthetic units. The dorsum, sidewalls, ala-nostril sills, nasal tip, soft triangles, and columella are considered the topographic units of the nose. The nasal dorsum, side walls, columella, alar margins and soft triangles are all covered with thin, smooth skin while the nasal tip and ala are covered with thick skin due to the presence of sebaceous glands. Thick sebaceous skin is more difficult to handle because it is inelastic, bleeds more and cannot be easily everted, but thinner skin often produces finer scars [2].

Furthermore, the skin of the upper two thirds of the nose is mobile, compared to the relatively fixed skin over the nasal tip and ala. Incisions should preferably be made parallel to the relaxed skin tension lines (RSTL) for optimal scar results. RSTL's of the nose are formed by the combined action of nasal muscles, gravity and the geometry of the underlying hard tissue. The format of the RSTL's is complicated as they are oriented transversely from the root to the tip, but change direction on the ala and columella where they are oriented perpendicular to the nostril orifice.

The contour of the nose varies directly from area to area. The surfaces of the nasal tip, ala, dorsum and columella are convex, while the nasal sidewalls and soft triangle are concave. These hills and valleys characterise the anatomic sub-units and create changes in light reflection

and shadowing producing transition zones. Skin flaps tend to contract centripetally, tending to produce convex contours which can be used advantageously in reconstructing nasal tip, ala and dorsal defects. However, skin grafts are better able to adapt to concave contours making the lateral nasal wall a preferable graft recipient site [3].

Case report

We present the case of a 68 year old female with a nodular, pigmented, round tumor of a 12 mm diameter (figure 1). Dermatoscopic examination showed peripheral basal pearls and central telangiectasias (figure 2). The lesion was asymptomatic, located in the medial canthus of the nose and had a approximately 5 year evolution.

The tumor region was completely excised under local anesthesia with a 3 mm margin, repairing the obtained defect with a rotation flap. The tumor was sent to histopathological examination, which confirmed the diagnostic of pigmented nodular basal cell carcinoma.

Histopathology

The histopathological exam revealed the diagnostic of nodular basal cell carcinoma with adenoid cystic areas. The tumor was pigmented, ulcerated, with invasion in reticular dermis, desmoplastic fibrous tumor stroma, myxoid areas, minimum lympho-histiocytic infiltrate and solar elastosis (figure 3).

Discussions

BCC occurs in the middle aged or elderly with 90% of lesions found on the face above a line from the lobe of the ear to the corner of the mouth. A skin biopsy may be necessary to confirm the diagnosis and is often required to determine the histologic subtype of BCC.

We excised the tumor with a rotation flap (figures 4, 5), which provides the ability to mobilize large areas of tissue with a wide vascular base for reconstruction. These flaps have a wide base and thus an excellent blood supply. The procedure involving the classic rotation flap can be thought of as closure of a triangular defect.



Fig. 1. Macroscopical tumoral aspect

The defect can be visualized as a portion of a much larger circle. By cutting along the arc of the circle, tissue is freed to rotate into the defect. The disadvantage is that these flaps require relatively extensive cutting beyond the defect to develop the flap, thus increasing the risk of nerve damage or bleeding.

In the following part of this article we present other surgical options we could have tried instead.

Basal cell tumors located at areas of great esthetic value, such as in our case, may be best approached with Mohs' surgery. Mohs micrographic surgery is a technique described by Dr Frederic Mohs and the purpose of Mohs surgery is to remove the cancer while sparing the most amount of healthy tissue. In Mohs surgery, first the visible tumor is removed, next, thin, horizontal sections through tumor margins are examined under the microscope. Any microscopic remains of the tumor are mapped to the original tissue and re-excised. This process is repeated as necessary until no tumor remains [4, 5].

Recurrence is possible and is attributed to incomplete excision or malignant transformation, which, although being rare, has been reported,

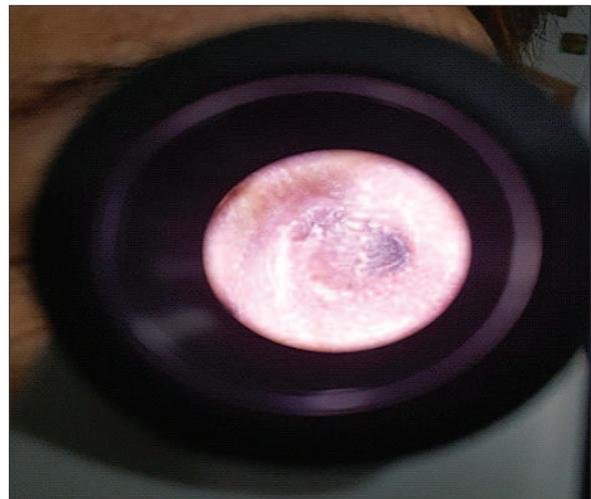


Fig. 2. Dermatoscopic examination

that is why the best surgical method remains Mohs surgery in this case [5].

We could have closed the defect by primary intention, but this method is more suited for small defects, under 1 cm, in the superior 2/3 of the nose. The disadvantage is that primary healing does not respect the esthetic units and the tension lines. Primary closure may be an acceptable technique if it can be achieved without

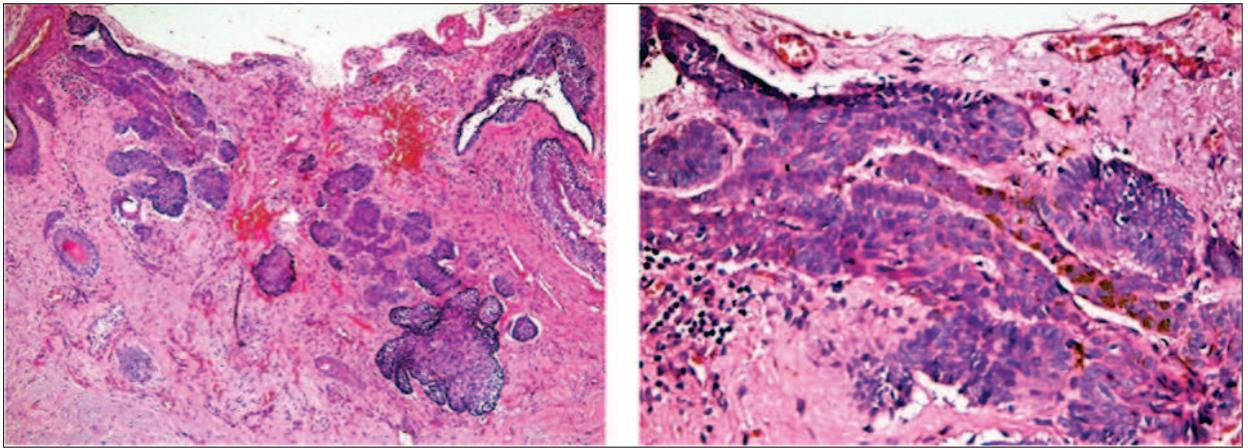


Fig. 3. Histopathological features

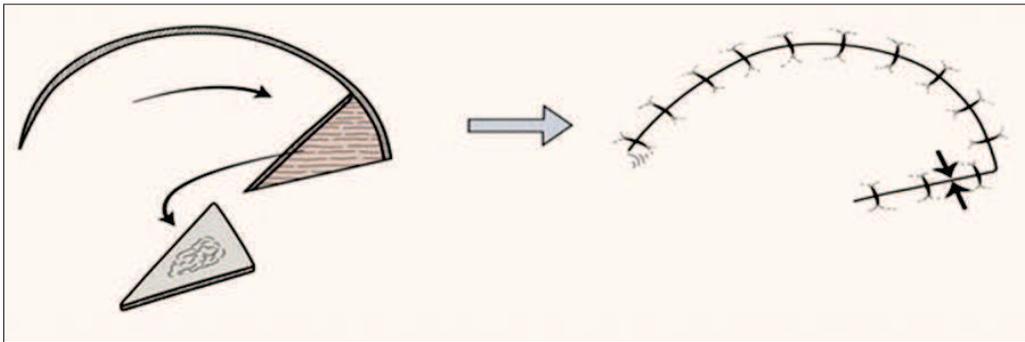


Fig. 4. Rotation flap - model



Fig. 5. Rotation flap

excessive tension, deformity, asymmetry or impaired function.

Similar to primary intention, secondary intention is suited for small or medium superficial defects, includes simplified wound management, no need for surgery, anesthesia or hospitalization, no significant risk of complications, has low costs, but the healing time is long, the results are unpredictable and often remains a scar, which is often hypopigmented, marred by telangiectasias, shiny, smooth, and atrophic.

Healing by secondary intention is inappropriate for complex defects where multiple tissue layers are absent and where structural support is indicated [6].

Skin grafts are another option for a lesion in that particular place, but these depend on the microcirculation and the contact with the donor tissue and, also, with the patient's systemic diseases.

Skin grafts can be full-thickness, split-thickness and composite grafts. Split-thickness skin grafts are composed of epidermis and a portion of the underlying dermis. They have the advantage of containing less tissue than full thickness skin grafts and thus less revascularized after transfer and improving the chance for graft survival and may be used to cover large wounds on the nose. The disadvantages include the compromised aesthetic results and miss match of color and texture.

Split-thickness skin grafting plays a role in nasal reconstruction only in the case of a virulent cancer when a more involved reconstruction is delayed to observe for potential tumor persistence.

The full-thickness skin graft consists of epidermis and full-thickness dermis. It resists contraction, has a texture and pigmentation similar to those of normal skin, and requires a well vascularized, uncontaminated recipient site for survival.

Avascular tissues are in general unable to support full-thickness grafts, therefore they should not be placed over these sites.

Composite grafts contain two or more tissue layers. Composite grafts have been used to repair columellar and nostril margin defects and deficiencies of nasal lining [7].

Grafts are harvested from a number of locations including upper eyelid, nasolabial fold, preauricular, postauricular, supraclavicular, clavicular, neck, and inner upper arm.

Flaps are a very good surgical option and come in a great variety: rotational, glabellar, frontal, V-Y, bilobed, rhomboid, double Z, etc. These local flaps taken from within the aesthetic sub-units of the nose give excellent aesthetic camouflage for small defects because of skin match regarding texture, color and thickness.

A glabellar flap is an upper nasal flap used to reconstruct nasal defects too large for bilobed flap repair (figure 6) [8]. It is a one stage repair and provides excellent color and thickness match. The glabellar region provides an excellent source of adjacent tissue to reconstruct wounds of the superior and lateral nose. The maximum size of the lower and mid-nasal defects to be closed by a glabellar flap is less than 2 cm. If a larger flap is required a forehead flap may have to be considered. The disadvantages are its limited rotational movement and the introduction of differences in skin thickness along the wound margins.

Differences in skin thickness tend to occur when glabellar skin is moved down to lie adjacent to the thinner medial canthal skin. One

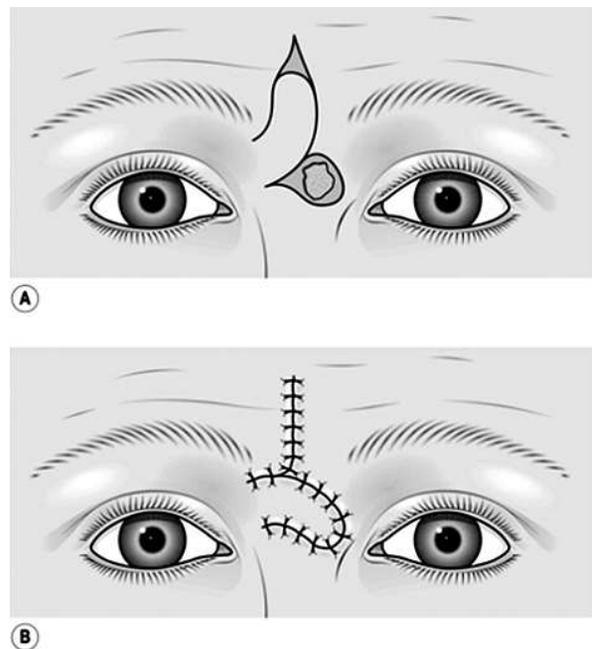


Fig. 6. Glabellar flap - model

of the other disadvantages of this flap is that the scars of this procedure are rarely optimally placed in RSTL or along borders of aesthetic sub-units.

The forehead flap is a useful technique to reconstruct deep and large nasal defects. The mid-forehead represents a maximum tissue reservoir for reconstructing large, full-thickness defects of the nose. A forehead flap is the method of choice for closure of nasal defects which are not amenable to the simpler reconstructive methods described above. In general, nasal defects larger than 2.5 cm in length are best closed with a forehead flap (figure 7) [9,10].

Other indications are nasal defects with exposed bone and cartilage or cases where periosteum or perichondrium is deficient. The flap is lifted while dissecting in the subgaleal plane. If the donor site defect is larger than 4.5 cm, primary closure may not be feasible and the remaining defect is left to heal by secondary intention [11].

Advantages of this flap include the fact that it provides an excellent color and texture match to the missing nasal skin. The disadvantages include the fact that it is at least a two-stage procedure and that often patients require "touch up" surgeries to provide the best possible cosmetic outcome.

A V-Y advancement flap is created by making a V-shaped incision and advancing the broad base of the V into the defect (figure 8). The resulting defect is closed primarily in a Y-shape. However, this flap has the limitations in mobility, depending on the looseness of the skin that is being mobilized. The advantages include having similar tissue in the same field and the excellent blood supply. V-Y flap closure is used to close high-tension wounds in areas where undermining the skin alone will not close the wound. It should be reserved for less cosmetically sensitive areas [12].

The bilobed flap is a double transposition flap commonly used in reconstruction of (figure 9). It uses two adjacent, smaller flaps of skin in series that are transposed over intervening skin. The bilobed flap allows for the movement of more skin over a longer distance than that possible with a single transposition flap. This flap is especially useful when it is applied to facial areas where skin is less mobile, because it allows for reconstruction of the primary defect with skin of matching consistency and color.

The use of a bilobed flap is indicated when the tissue adjacent to a cutaneous defect is insufficiently mobile to close the defect without causing tissue distortion. A bilobed flap is often used to repair defects of the nose, especially when the defect is less than 1.5 cm in diameter.

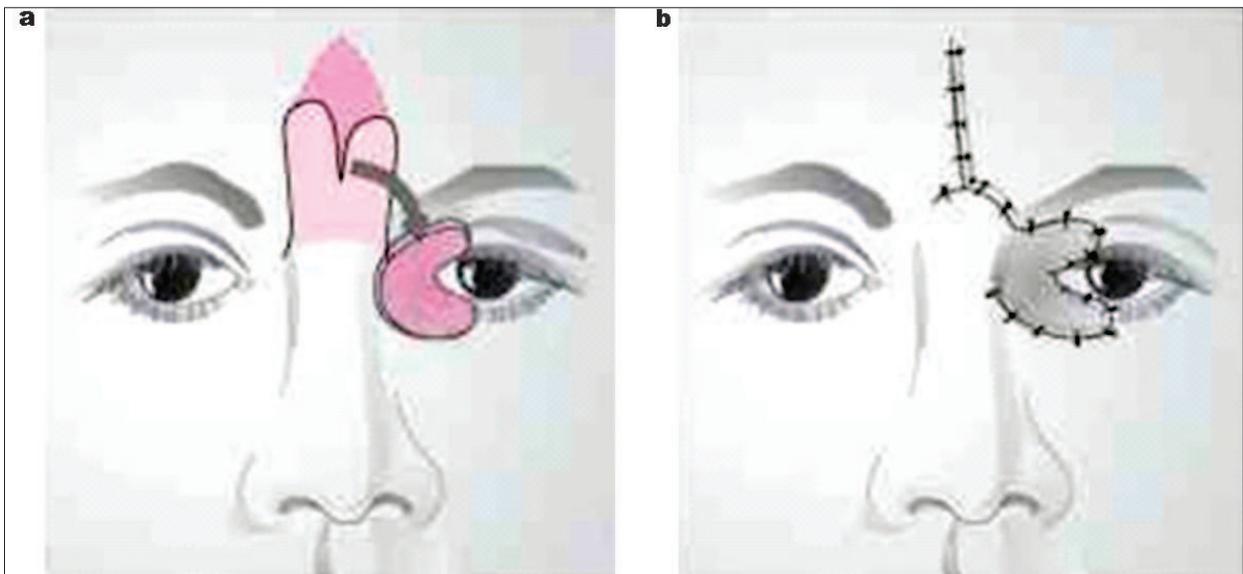


Fig. 7. Forehead flap - model

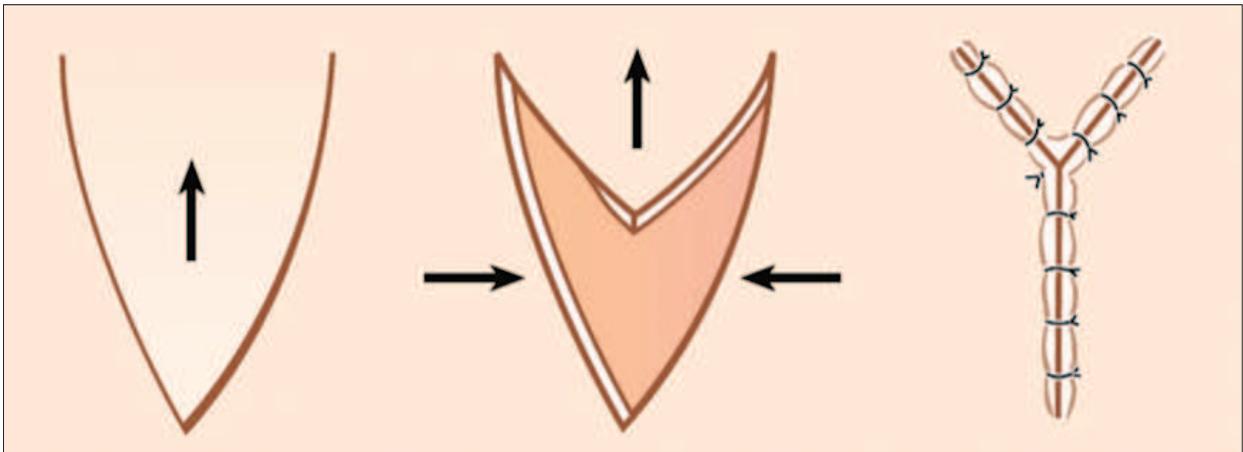


Fig. 8. V-Y advancement flap

Nasal skin is rearranged to fill in the hole left after cancer removal. The skin texture and color match is excellent, because the skin used for the repair is native nasal skin. The primary advantage of the bilobed flap is the use of adjacent, well-matched skin but the main disadvantage is the multiple secondary scar lines [13].

The rhomboid flap makes optimal use of tension redistribution by orienting the flap design according to the lines of maximum extensibility (perpendicular to relaxed skin tension lines). Rhomboid flaps rotate neighboring tissue to close the primary surgical defect, whereas the donor site is closed by primary closure (figure 10). These flaps are not recommended for extremely large lesions or

where the resulting vector of tension distorts neighboring fixed landmarks such as the nasal ala, eyelid margin, or the lip.

The natural, parallel, horizontal wrinkles of the central forehead prevent good aesthetic result with this closure, therefore, rhomboid flaps are generally avoided in this area. These flaps are useful when the size or shape of the lesion does not permit direct closure using a standard fusiform or elliptical incision. The esthetic and mechanical properties of these flaps make them especially useful for reconstruction of lower cheek, mid cheek and upper lip, as these areas have less prominent tension lines [14].

The double-Z rhomboid plasty is a technique of four transposition pedicle flaps characterized by borrowing the required tissue from two

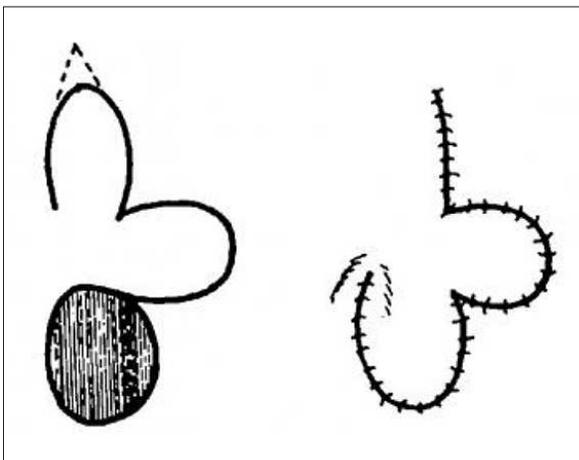


Fig. 9. Bilobed flap - model

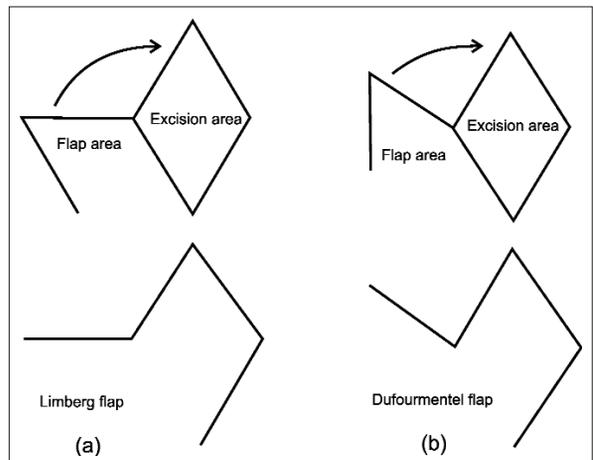


Fig. 10. Rhomboid flaps - models

nonadjacent, opposite sides of the defect. When used in the face, where primary closure or reconstruction with direct tissue advancement is not feasible, the technique will avoid displacement or distortion of mobile anatomic landmarks. These flaps can be used when there is tissue availability in only two opposite directions, where closure by advancement flaps is not possible, for reconstruction of defects of two different tissue types and in the presence of wrinkles, to support the requirements of placing most scars in that direction [15].

The ideal reconstruction closes a cosmetic deformity with a good tissue match and no stenosis or distortion. Immediate closure decreases morbidity time, prevents the danger of secondary hemorrhage and minimizes the chances of wound infection. However, a delay up to 3 to 4 days has a very low risk of complication and does not compromise the final results [16].

In the article "Nasal reconstruction" published by H.D. Vuyk and S.J. Watts, the analysis

of 200 consecutive nasal reconstruction patients operated demonstrates the frequency of each reconstructive method. They revealed that skin grafts are more frequently used (23%), followed by a variety of flaps (21%), secondary intention (15%) and primary closure (1%) [3].

Conclusions

A successful reconstructive technique takes a detailed knowledge and understanding of the area's anatomy for obtaining the most functional and esthetic results.

The surgeon who treats malignant tumors of the nose must consider the functional and aesthetic qualities of the nose and appreciate that cure is the primary objective of treatment.

A variety of reconstructive methods have been reviewed in this article. Nasal reconstruction has very complex methods and high aesthetic standards are expected.

The area of the nose will always be a challenge in the search for the optimal result.

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Conflict of interest
NONE DECLARED

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