

Usefulness of rotation and advancement flap for the closure of skin defects in the malar region

Utilidade do retalho de avanço e rotação para fechamento de defeitos cutâneos na região malar

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ABSTRACT

The present study introduces an advancement and rotation flap that can be used for the reconstruction of surgical defects located in the malar region. The design is essentially a triangle containing the defect, where one line runs parallel to the lateral part of the nose along the nasolabial fold, while another starts at the same point and follows the dynamic lines of the malar region. In order to complete the geometrical shape of the flap, a Burow's triangle is performed at the end of the fold. The final tension force occurs on the nasal wall, preventing ectropion. The repositioning of the malar fat restores the contour of the region.

Keywords: *mohs surgery; surgical flaps; zygoma.*

RESUMO

Apresenta-se retalho de avanço e rotação que pode ser utilizado para a reconstrução de defeitos cirúrgicos localizados na região malar. O desenho se resume num triângulo contendo o defeito em que uma linha desce paralela à lateral do nariz, acompanhando o sulco nasogeniano; outra se inicia no mesmo ponto e segue as linhas dinâmicas da região malar. Para finalizar, executa-se um triângulo de Burow no final do sulco. A força de tensão final se dá sobre a parede nasal evitando o ectrópio, e o reposicionamento da gordura malar devolve o contorno da região.

Palavras-chave: *cirurgia de Mohs; retalhos cirúrgicos; zigoma.*

INTRODUCTION

Flaps consist of the movement of an area of skin—adjacent to, or not adjacent to a defect to be repaired—which is nourished by its own vascular pedicle. They can be classified into four types, according to the movement of the skin towards the receiving area: advancement, rotation, transposition, and interpolation.¹⁻³ That classification takes into account only the flap's main movement. In many situations, two types of movements must be performed in order to achieve superior functional and aesthetic results—for example the combination of the advancement and the rotation movements, as proposed in the present article. The malar region is a facial aesthetical unit that resembles an inverted triangle, which lends symmetry and volume to the face. It is superiorly delimited by the lower eyelid, laterally by the pre-auricular region and medially by the nose's lateral region, which extends along the nasolabial fold. The abundant neurovascular network, and the mobility and volume provided by this region's subcutaneous tissue are unique features that allow the implementation of various flap types.⁴⁻⁹ The repair of the upper malar region nevertheless requires special attention to certain items, such as:

- the positioning of the tension vector at the end of the reconstruction, aimed at avoiding ectropion, due to the proximity to the lower eyelid
- restoration of the intrinsic texture, volume, and mobility characteristics
- the final scar in this area, which becomes very visible if the direction of the incisions is not aligned with the direction of the relaxed skin tension lines (RTSL)

The present paper proposes a unipediculated advancement and rotation flap for repairing defects located in the upper and medial portions of the malar region. It is possible to restore the region's volume using adjacent skin with similar characteristics, placing the tension point in the lateral region of the nose.

METHOD

The proposed flap was performed on 15 patients at the Hospital Italiano de Buenos Aires, Argentina, following Mohs Micrographic surgery (MMS) that had resulted in medium and large surgical defects located in the upper or central malar region.

A) Drawing the flap

1) Primary Triangle: the surgical wound (A) is included in a triangle whose base is located on the nasal wall, with the other two sides touching the defect and intersecting in the lateral region, forming a tip (B); it is crucial to identify the tension lines and the orbital rim.

2) Incision movement: A caudal incision is carried out starting at the triangle's base (C), continuing along the nasogenian fold, observing a margin of at least 3mm from the nasal ala in order to keep the physiological space between the aesthetic units. The incision must reach the muscular layer, taking care to avoid severing the external maxillary and angular arteries. As a significant movement is often required, the longer the incision the greater the movement achieved. As a result, the incision should go down to the labial commissure, where the unloading triangle—which can be performed in several ways and sizes according to the necessary movement of the flap—is drawn (D). 10 (Figures 1 and 2)

3) Drawing the caudal Burow's triangle

When performing the flap's advancement-rotation movement, two challenges arise: the excess of skin in the caudal region and the lower portion's resistance. In order to resolve these issues, the authors propose removing a second defect in the lower portion before moving the flap, as described below:^{4,5,8}

A) Classic form: a triangle (whose base would correspond to the extension of the movement incision) is removed from the caudal region of the flap. The greater the vertical axis of the defect, the greater the triangle will be (Figures 1 and 3).

B) Inverted Burow's Triangle: a triangle is removed from the caudal region of the flap. This type of triangle (inverted) generates greater upward mobility, however the resulting scar is less aesthetic (Figures 2 and 3).

C) Retrograde cut: this is an unloading incision, which confers greater mobility to the flap (Figure 3).

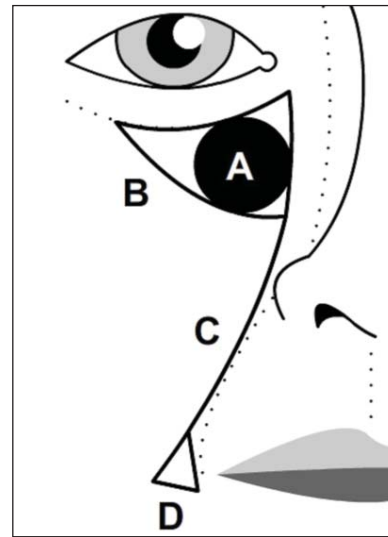


FIGURE 1: A—Defect, B—triangle with incision respecting the periorbital border, C—incision throughout the lateral nasal wall following along the nasogenian fold, D—unloading triangle

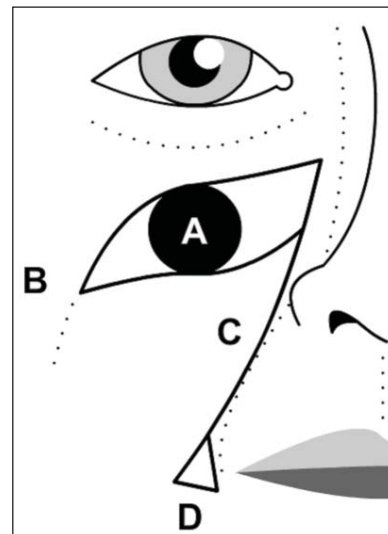


Figure 2: A—Defect, triangle with incision respecting the RTSL, C—incision throughout the lateral nasal wall following along the nasogenian fold, D—unloading triangle

D) Zetaplasty: this is used when the skin is very saggy, however there is the necessity for a longer horizontal vector (Figures 3 and 4).

4) Moving the flap

Before moving the flap, dissection followed by meticulous hemostasis must be carried out, keeping it in a deep plane, near its pedicle. Then the tip of the flap is tractioned with a hook attached to the dermis, raising it up (like a tent) until reaching an angle formed between the base and the top side of the primary triangle.⁷ (Figure 4)

5) Suture

The proposed flap's suture is an important step in preventing the traction of the palpebral region and secondary ectropion. Three sutures in a "U" shape are carried out starting from the flap's lower region, in the deep subcutaneous tissue (Points

	A	B	C	D
1				
2				
3				
4				

FIGURE 3: Different ways to resolve the caudal sector

1—Burow's Triangle. 2—Inverted Burow's Triangle. 3—Retrograde incision. 4—Zetaplasty. A = drawing. B = initial defect and location of the different types of displacement (straight and curved arrows). C = final displacement prior to suturing. D = final suture's shape. (*) The asterisk marks the flap's caudal sector and how it moves as it is tractioned upwards (straight arrows in B and C). Zetaplasty is intended to decrease the flap's tension and not to increase the upward displacement.

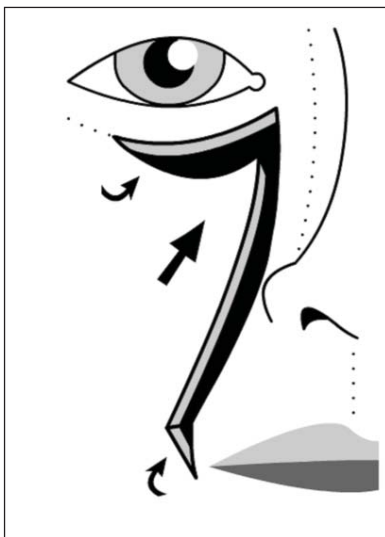


FIGURE 4: Movement of the flap.

1, 2, and 3) with 4.0 absorbable suture. These points decrease the space created by the detachment, as well as the tension arising from the anchoring of the subcutaneous tissue in its new bed, transferring the tension to the base in the nose's lateral area. When the defect is tangent to the lower eyelid, a further point (Point 5, Figure 5), attaches the malar fat to the periosteal bor-

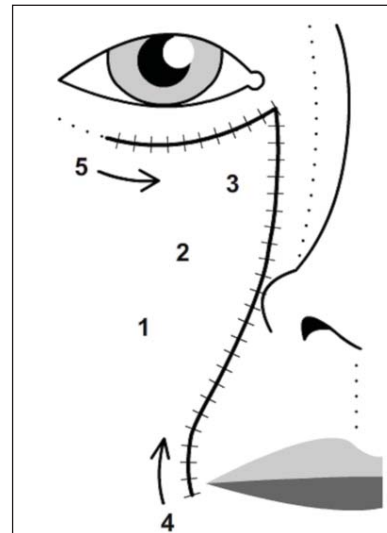


FIGURE 5: Order of the suture stitches.

der, aiming at decreasing the vertical tension in the eyelid. 1, 2 Next, a 5.0 absorbable suture is used for a dermal suture starting in the caudal region and ascending along the nose's lateral area (Point 4). Finally, the skin must be sutured with 5.0 or 6.0 non-absorbable suture. (Figure 5)

RESULTS

Three of the 15 patients progressed with palpebral edema, ectropion, and tent effect in the lateral region of the nose. The others progressed without sequelae and imperceptible aesthetic scarring in the 12-month follow-up (Figures 6 and 7).

DISCUSSION

The advancement and rotation flap is one of the options for the reconstruction of the malar region, with the following advantages:

- Excellent aesthetic results, for it uses the same skin as the aesthetic unit and because the suture lines end up hidden in the boundaries between the malar region and the lower eyelid, nose, and nasogenian fold. It is also important that the anchoring and the final tension force remain aligned with the lateral wall of the nose, lending increased safety to the flap, in order to avoid secondary ectropion;
- Lower risk of palpebral edema, because it keeps the lower eyelid's drainage intact;
- High survival rates, since it has a large vascular lymphatic pedicle.

As with all flaps that require a significant detachment close to the eyelid, it requires some caution:

- it must not be performed if the defect invades the lower eyelid. In such cases, the flap must be brought closer, and the malar defect covered, with a choice being made for lateral advancement or for a total thickness graft to cover the palpebral area;

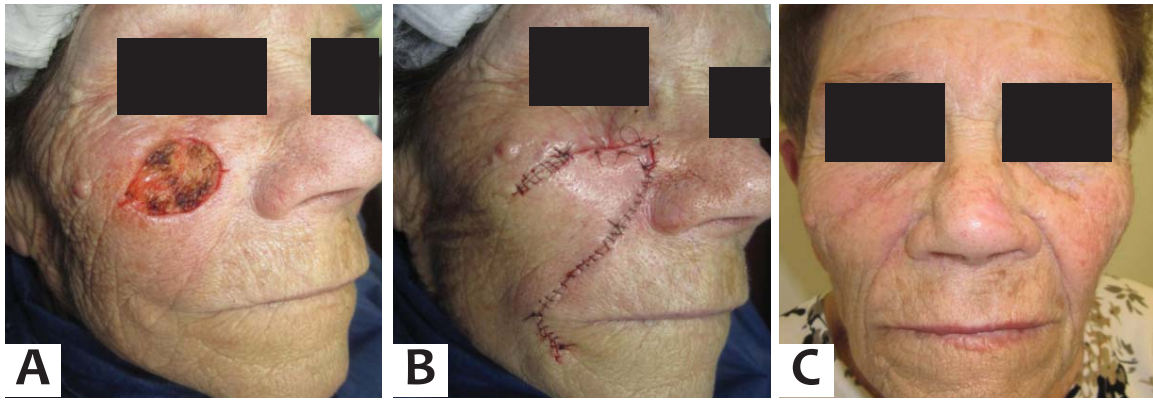


Figure 6: A—Final defect after two MMS stages. B—Immediately after reconstruction. C—One year after the surgery

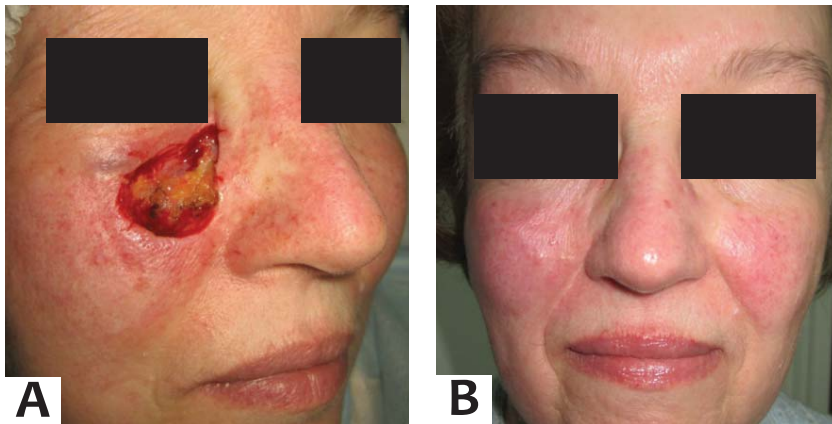


FIGURE 7: A—Defect after the removal of a basal cell carcinoma in the malar region. B—Outcome one year after the surgery.

- it must not be used in defects that invade the nasal wall, to prevent the formation of a tent effect between the malar and nasal regions;
- in men, there is risk of undesired elevation of the upper line of the beard, given that the caudal region’s skin will be anchored to the malar;
- for defects in the upper malar region it is necessary to decrease the fat in the triangle’s tip in order that the region does not become concave and develop a tent effect.

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CONCLUSION

This hybrid unipediculated advancement and rotation flap is an interesting surgical option for the correction of medium and large-sized defects in the upper malar region. The present study has shown that the technique can be performed and reproduced, nevertheless a greater number of cases must be studied in order to obtain greater statistical significance of success and complications. ●

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