

Rhomboid Flap: An Option to Many Anatomical Regions

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Abstract: Introduction: The rhomboid transposition flap can be used at any region on the body surface, and is widely used on reconstructive surgery. When it is used for surgical procedures in order to correcting facial defects, the Limberg's flap produces good functional and aesthetic results, particularly when scars are positioned between the aesthetic units of the face.

This article will describe the rhomboid flap technique and discuss the versatility, safeness, applicability and complications of Limberg's flap for cutaneous reconstruction, which can be in a huge part of body segments

Results and Discussion: The Limberg's flap is a rhomboid transposition flap. The flaps are made by taking into account size and location of the original defect and elasticity of the surrounding tissue. From the resection defect resulting, a lozenge is drawn with internal angles of 60 degrees and 120 degrees and the closure is completed by transposing the flap towards the defect. This flap provides very good results to be executed with predictability, high safeness degree and low rate of complications.

Keywords: Flap, Limberg, Reconstruction, Rhomboid, Surgery.

1. INTRODUCTION

The rhomboid transposition flap described by Alexander Limberg, in 1946, can be used at any region on the body surface, and is widely used on facial and breast reconstruction, neurosurgery, ophthalmology and proctology [1-3]. When used for surgical procedures for correcting facial defects, the Limberg's flap produces good functional and aesthetic results, particularly when scars are positioned at the junction of the aesthetic units of the face [4].

2. DISCUSSION

The rhomboid flap has been considered the best technique for the treatment of the sacrococcygeal pilonidal disease [1,5]. It is a safe and versatile flap, as it can provide the transference of the adjacent tissue to the defect with the same skin color and texture, despite of generating increased tissue mobilization and scarring [1,4]. This procedure can be easily executed and also has a low rate of complications as epitheliolysis with the partial necrosis of the flap, hematoma and bacterial infection.

In most cases, these complications can satisfactorily respond to conservative treatments, and can be minimized through a correct surgical marking and a meticulous intraoperative hemostasis [1, 4].

The main restriction when using the Limberg's flap is that the secondary defect should be directly closed, and the position of the flap can not be facilitated using grafts on the secondary defect. The use of a flap depends on the local skin availability. Due to the fact that the Limberg's flap can be applied in many different directions, it is more often possible to prepare a better flap using this technique, instead of using versatile models [6].

In order to create a parallelogram, the skin excess resection might seem unnecessary, as it increases the bloody area. However, considering that the great majority of the lesions come from tumor excisions, such resection provides larger safety margins without compromising the final functional-aesthetic result [1,7].

The rhomboid flap can be double or triple, coming from surgical defects similar to parallelograms or hexagons respectively, and it is an alternative to large surgical defects, as it allows the tension force to be cancelled on the medium portion of the defect, minimizing the risk of distortion of the anatomic architecture [6,8].

Some different proposals have been made concerning to the original technique, in which the lesion can be circular or elliptical excised, and the flap is designed next to the defect. Such flap is denominated Limberg pedicle flap. This technique has the goal of minimizing 'dog ears' formed on the flap transposition in the original technique, and preserving the facial cosmetic

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units. Its disadvantages would be longer surgical procedure, taking into account the surgeon's skills [9].

3. THE SURGICAL TECHNIQUE

Considering the defect resulting from the resection, a lozenge is drawn with 60° angles in the extremities of its longer axis, and 120° angles in the extremities of its shorter axis. This drawing should be made with two

equilateral 60° triangles aligned base to base, so all the defect sides should present the same length, which has to be equal to the minor diagonal. The first flap side is formed by extending the shorter diagonal from the defect. The second flap side is formed marking a line with the same size of the first flap side adjacent to the defect, with a 60° angle at the flap vertex. The closure is completed by transposing the flap towards the defect, using a 60° rotation (Figures 1 and 2).

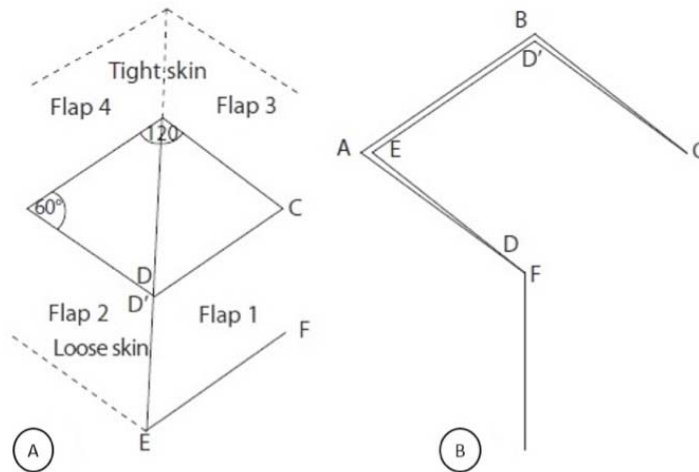


Figure 1: Limberg's flap design. **A:** For any defect. There are 4 possible flaps. **B:** Point A corresponds to E, B corresponds to D', D corresponds to F.

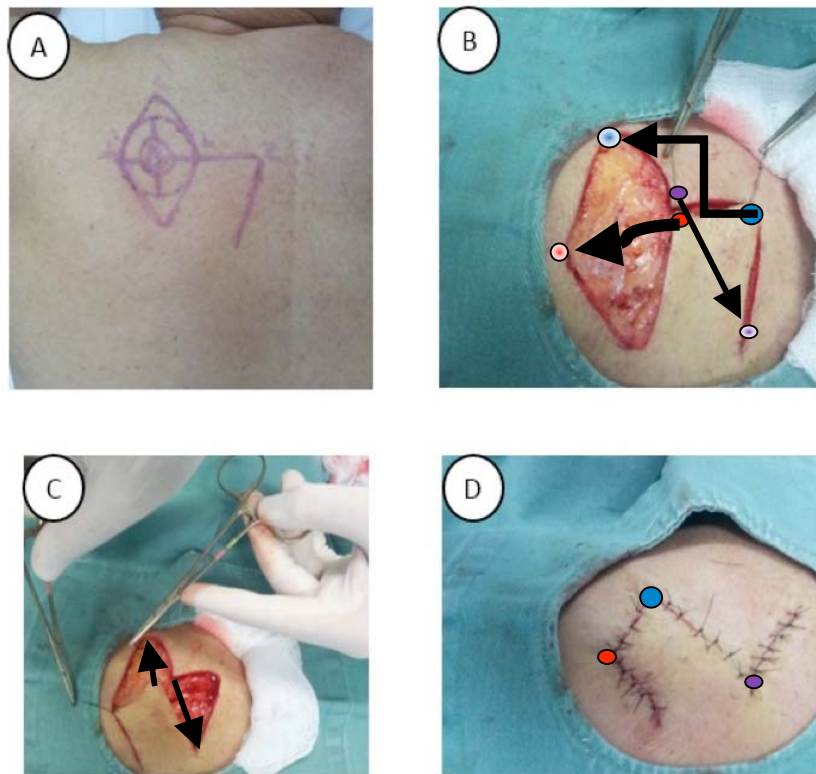


Figure 2A: Flap demarcation previously to resection. **B:** Rhomboid flap resection. **C:** Flap positioning. **D:** Immediate post operative.

The final scar flap configuration is mostly predictable. For each defect, four rhomboid flaps can be prepared. Therefore, the best adjusted flap to the defect

should be prepared taking into account the skin tension lines, the tissue texture and the location of the defect to be repaired (Figures 3 and 4).

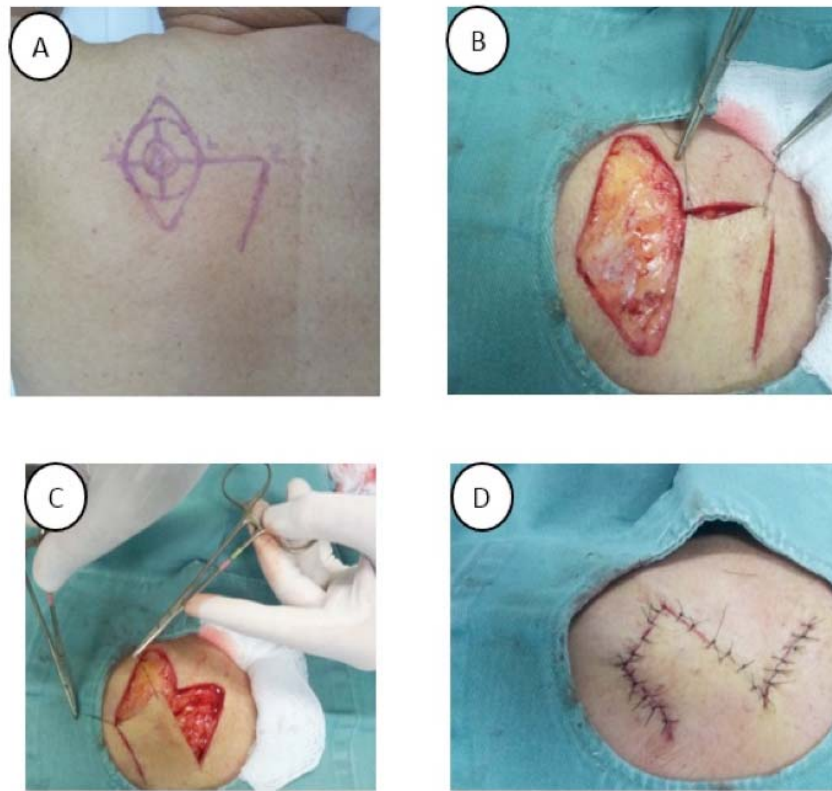


Figure 3A: Flap demarcation previously to resection. **B:** Rhomboid flap resection. **C:** Flap positioning. **D:** Immediate post operative. No marks.



Figure 4A: Squamous cell carcinoma demarcated. **B:** Immediate post operative. **C:** Late post operative-satisfactory appearance.

The flap measures and their preparation must be performed previously to the resection of the border defects, due to the subsequent enlargement of the lesions. The border releasing procedure of the lesions is performed from the flap edges and base, providing the tissues, adequate approach without causing any tension during the closing procedure [1,10-12].

4. CONCLUSION

The Limberg's rhomboid flap can provide the closure of small to large defects in several anatomic areas, achieving satisfactorily aesthetic results (Figure 5).

This can be executed with predictability, high safety degree and low rate of complications. The facility of making the flap design as well as the result of the scar, (Figure 6) with no skin tension during the closing procedure after the flap rotation, make the Limberg's rhomboid flap to be considered the first option, to the great majority of the reconstructions in which the tissue presents a rupture of its integrity [1].

These figures illustrates de success of the Limberg's flap used as technique by the surgeons, researchers, of this article.



Figure 5A: Basal Cell carcinoma. **B:** Mohs Micrographic Surgery resection. **C:** Immediate post operative. **D:** Late post operative satisfactory appearance.

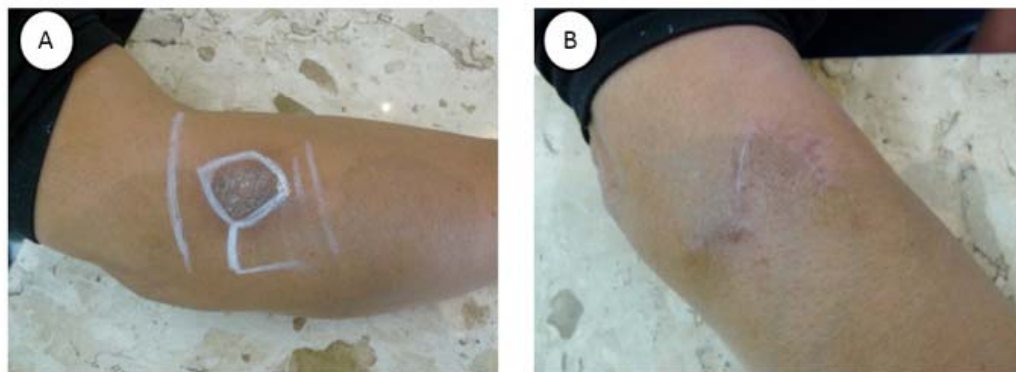


Figure 6: Neurodermatitis. **A:** preoperative. **B:** post operative.

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