

Limberg flap for closure of skin defect after excision of high-grade pleomorphic sarcoma. A case report

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Case Report

Plastic Surgery



Background

The Limberg flap is a transposition flap with a geometric design and random vascular pattern. Multiple variants of the technique have been proposed and developed with the aim of improving aesthetic results or modifying its range of motion. These flaps allow coverage of defects of all types of thickness and size. This article presents a case report of en bloc oncologic resection of a patient who was diagnosed with high-grade pleomorphic sarcoma, leaving an important skin defect in which a variant of the Limberg flap was used with excellent post-surgical results, so it is essential to promote the use of this type of basic flap as a fundamental part of the reconstructive tools of all plastic surgeons.

Keywords: Limberg flap, local flaps.

A skin flap consists of skin and subcutaneous tissue transported from a donor area to a recipient area, maintaining a vascular connection with the site of origin,¹ within the variety of existing flaps, the rhomboid type are transposition flaps with geometric design and random vascular pattern. Multiple variants of the technique have been proposed and developed with the aim of improving aesthetic results or modifying its range of motion. Its first description was made by the Russian dentist, physician and maxillofacial surgeon Alexander A. Limberg and was first published in 1946 in the city of Saint Petersburg, in the article «Mathematical principles of local plastic procedures on the surface of the human body».^{2,3} This flap is based on the principles of rotation dynamics and tissue transposition, it allows coverage of defects of all types of thickness and size, which is why it has been described from small oncological defects to large bloody areas,⁴ it has been used by otolaryngologists, ophthalmologists, and maxillofacial surgeons due to its versatility and the fact that it can be performed almost anywhere on the body⁵ and in plastic surgery one of its main uses is in the correction of defects secondary to resection of skin cancer. (Figure 1)

Case report

A 65-year-old female patient with chronic diseases of arterial hypertension, hyperuricemia, hypothyroidism and chronic kidney disease. She refers to detecting in November 2022 a mass of

approximately 2x2 centimeters that after a biopsy performed in April, presents rapid growth, which is why a pre-surgical protocol is initiated by the surgical oncology and plastic surgery services. On physical examination, a tumor of approximately 20x15 cm was found in the left scapular region with erythema and ecchymosis, indurated and hyperthermic. The tomographic study showed compression of adjacent structures (Figure 2), for which reason joint surgical management was decided by oncological surgery and plastic surgery, using the Limberg flap to close the skin defect. (Figure 3)

Discussion

Rhombic flaps are versatile flaps that are quite useful for the reconstruction of all types of defects. They have a random vascular pattern and their design variants allow closure of the secondary defect according to the surgeon's considerations. They are useful for the reconstruction of any type of defect, having the advantage of using tissues with similar characteristics, low morbidity, and functional and aesthetically acceptable results, for which they have gained popularity in facial oncology surgery. For all of the above, these flaps are a fundamental part of the reconstructive tools of every plastic surgeon.⁴ Soft tissue reconstruction requires a thorough understanding of tissue anatomy and kinetics, and flaps and grafts should be considered when simpler closure methods result in excessive tension or distortion of surrounding structures.^{6,7} The rhomboid

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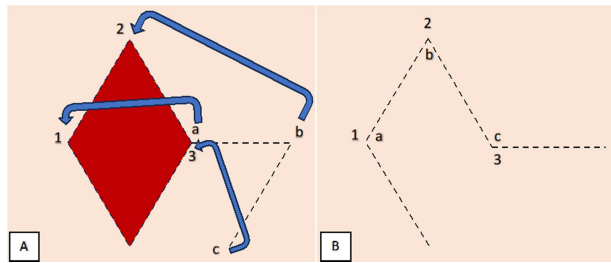


Figure 1. A. Rhomboid skin defect with flap planning, mobilization points in: a, b and c towards 1, 2 and 3 respectively. B. Completion of the Limberg flap, note tissue mobilization in 1-a, 2-b, 3-c.

flap is one of the best-known and most used flaps in reconstructive surgery, it has demonstrated its success in different types of reconstructive and aesthetic situations as a full-thickness pedicled flap, used to cover adjacent defects with scars that are concealed to the maximum, giving excellent cosmetic results, especially on the face and other parts of the body after resection of different types of skin lesions,⁸⁻¹⁰ adequate knowledge of the mechanisms of rotation and sliding of skin tissues is necessary to indicate the use of this type of flap and to perform it. The skin can be moved from adjacent sites and must be mobile enough to close the defect with minimal tension.⁷

Conclusion

The Limberg flap and its variants have been widely used in the field of plastic surgery. Being local flaps, they provide tissue with a similar color and texture. In addition, they leave a very well simulated linear scar.

Conflicts of interest

The authors declare no conflict of interest.

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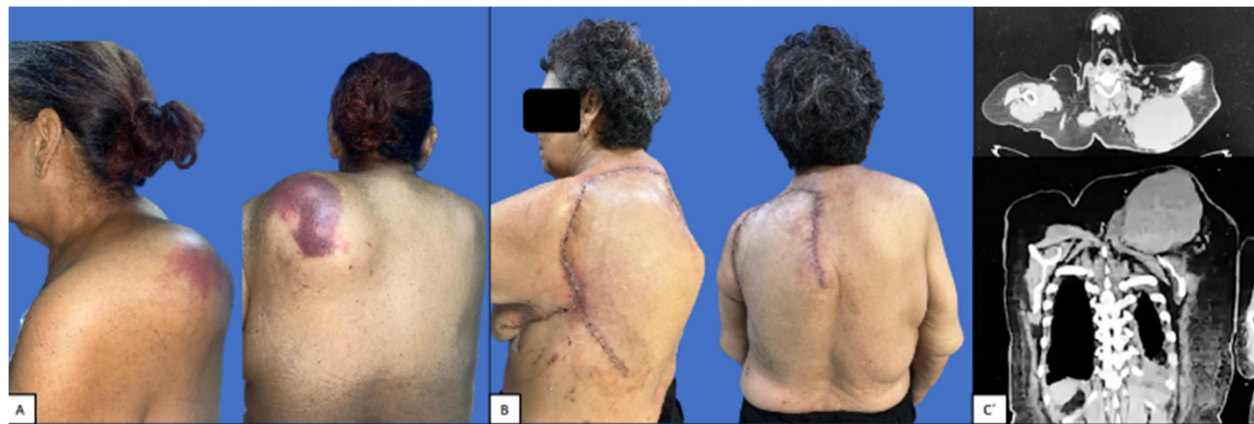


Figure 2. A. Clinical status of the patient, a mass is observed in the left hemi-dorsum. B. 2 weeks postoperatively. C and C'. Simple window tomography for soft tissues, axial section and coronal reconstruction where a rounded image of lobulated edges with density of soft tissues with heterogeneous areas of lower density in relation to necrosis is observed, compressing bone structures and adjacent soft

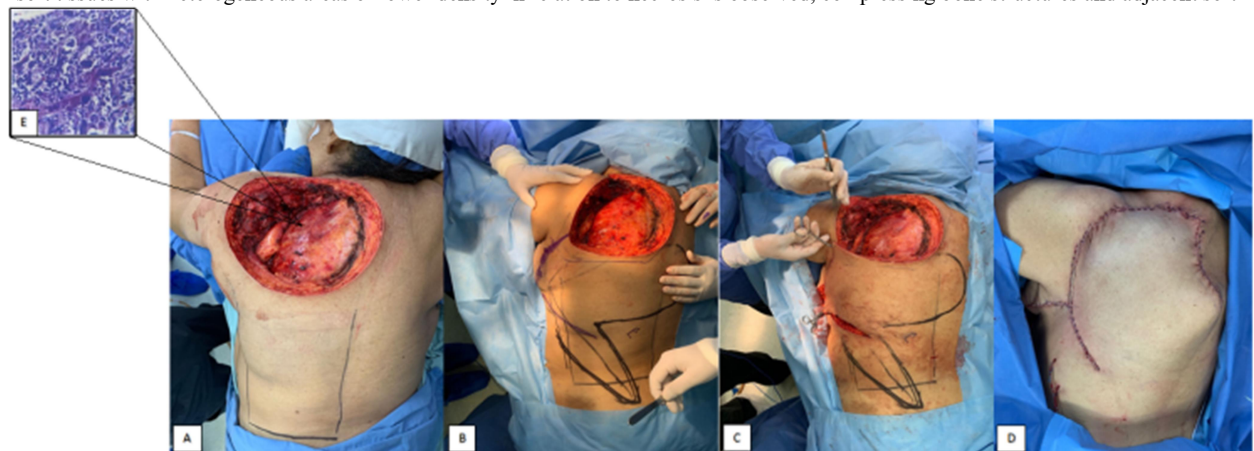


Figure 3. A, Skin defect after resection. B. Planning and marking of the Limberg flap. C. Raising the flap and mobilizing tissue. D. Skin coverage with Limberg flap. E. Histopathologic analysis with high-grade pleomorphic sarcoma.

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