

Skin flap alternatives for dermatological lesions on the leg

Alternativas de retalhos cutâneos para lesões dermatológicas na perna

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ABSTRACT

The use of skin flaps for covering lesions is a better option than skin grafts, due to the diversity of the receptor area after the tumor's resection and the greater degree of safety. For better results, the lesion's location and extent, as well as the safety of the vascularization, should also be taken into account. Three resections were performed, with different coverage techniques. The patients had excellent development, without necrosis or dehiscence. Keywords: reconstructive surgical procedures; surgical flaps; free tissue flaps; plastic surgery; skin diseases

RESUMO

A utilização de retalhos de pele para a cobertura de lesões é melhor opção do que o enxerto de pele, considerando-se a heterogeneidade do leito receptor após a ressecção do tumor e a maior segurança oferecida. Para melhor resultado devem ser levados em consideração também o local e a extensão da lesão, além da segurança da vascularização. Foram realizadas três ressecções com diferentes técnicas de cobertura. Os pacientes apresentaram excelente evolução, sem necroses ou deiscências.

Palavras-chave: procedimentos cirúrgicos reconstrutivos; retalhos cirúrgicos; retalhos de tecido biológico; cirurgia plástica; dermatopatias

INTRODUCTION

Leg lesions may arise from diverse etiologies, from traumatic to infectious, and even neoplastic. They may present as superficial or deep, with muscle and/or bone involvement, where severe infections may exist. Depending on the etiology, the evolution, the type of lesion and the anatomical characteristics of the leg, different reconstructions are proposed, with different structures involved, such as muscles, fascia, septum and skin, or a combination.¹ The site and size of the lesion are also important factors when considering the reconstruction. Due to the superficial anatomical vascular characteristic of the leg, where a great part of blood distribution occurs through musculocutaneous perforating vessels originating from deep vessels, the cutaneous flaps used for reconstruction in this region are based on the areas vascularized by this type of vessels.²

The incidence of skin cancer has been increasing over the last decades. The chances of developing skin cancer during a person's life is multifactorial, for instance due to sun exposure, skin type and phenotype, and family history.³ Skin cancers have a higher incidence in areas that are more exposed to the sun, and

Review articles with technical notes from the author

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are represented by the basal cell carcinoma, squamous cell carcinoma and melanoma. Basal cell carcinomas account for 65% of all epithelial neoplasias, the face being the most affected area. In turn, the squamous cell carcinoma represents 15% of all epithelial neoplasias, with 64% of them also present in the face.^{4,5} Melanomas have an incidence of 3% to 4%, accounting for the smallest among skin tumors. However, they present the highest mortality rate among all skin tumors.⁶

OBJECTIVE

The objective of this article was to present alternatives to skin flaps for cutaneous lesions in lower limbs.

METHODOLOGY

Three tumors were resected in three patients, using different coverage techniques. The options for cutaneous leg flaps are: circular rotation flap (small rotating arc), circular rotation flap (large rotating arc) and rectangular rotation flap. These options will be detailed below. In the first case, the skin tumor was located in the medial region of the lower third of the right leg, presenting 2.5cm in diameter, with clinical aspect compatible with basal cell carcinoma. In this patient the first option was chosen: circular rotation flap (small rotation arc). The tumor was marked [taking into consideration safety margins, and the planned skin flap to be performed (Figure 1). After the circular removal of the tumor, the rotation flap was designed, starting circularly on the lateral side of the tumor's perimeter, and extending cranially in the form of a hook, as a flap diameter similar to that of the tumor (Figure 2). A musculocutaneous perforating vessel (Figure 3) made it possible to mobilize the flap, even with a small arc of rotation. The donor area was then closed (Figure 4) after adjustment and release of the surrounding tissues.

In the second case, the skin tumor was located on the lateral posterior side of the right leg, presenting a 5cm diameter and clinical aspect compatible with basal cell carcinoma. The second option was chosen for this patient: circular rotation flap

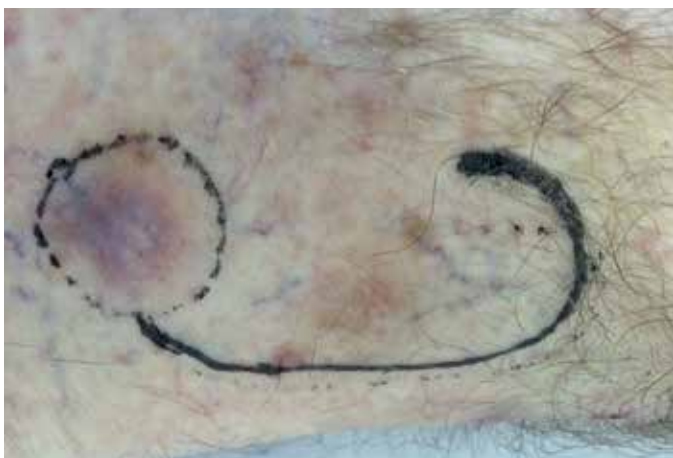


FIGURE 1: Planning of the skin flap rotation of the skin tumor in the medial lateral area of tibia, beginning at the center of the lesion

(large rotation arc). The surgical marking took into consideration safety margins and the cutaneous flap to be performed (Figure 5). After the circular removal of the tumor, the rotation flap was performed (Figure 6). It started circularly at the most distal area of the tumor perimeter and was extended cranially, with a diameter greater than that of the tumor. Its vascularization was based on a musculocutaneous artery. Due to the size and shape of the flap, it was easily and safely mobilized toward the receiving area. The primary closure of the donor area was performed after adjustments and release of the surrounding tissues (Figure 7).

In the third case, the tumor was located in the mid-third of the right leg, on the posterior face, presenting 3cm in diameter, with clinical aspect compatible with basal cell carcinoma. In this patient the third flap option was chosen: the rectangular rotation flap. The tumor was marked taking into consideration safety margins, and the cutaneous flap to be performed (Figure 8). After circular removal of the tumor, the rectangular flap was designed, starting rectangularly at the distal extremity of the tumor perimeter, and extending 4cm laterally and 5cm cranially, with measurements larger than those of the tumor. Its vascularization was based on a musculocutaneous artery (Figure 9). Due to the shape of the flap, it was mobilized easily and safely towards the recipient area. The primary closure of the donor area was performed after adjustments and release of the surrounding tissues (Figure 10).

DISCUSSION

The option of using the skin flap to cover the recipient area overlaps the use of the skin graft, since the latter is a thin and often vulnerable cover, especially when localized on



FIGURE 2: Location and dissection of perforating vessel

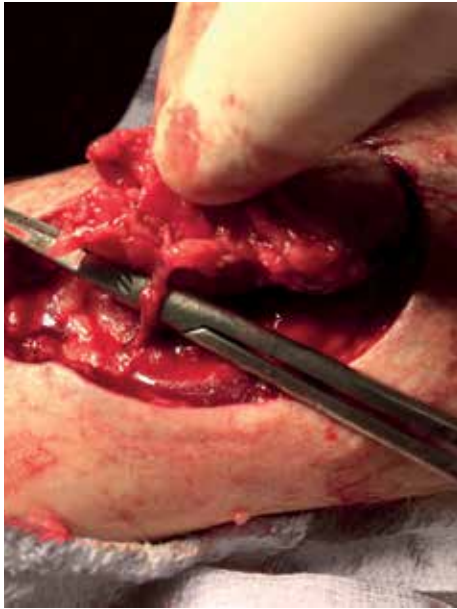


FIGURE 3: Isolation of the perforating vessel



FIGURE 5: Planning of the rotation flap with the large rotational arc (beginning at the most distal end of the skin tumor perimeter on the right calf)



FIGURE 4: Final appearance after flap rotation with leftover skin adjustments



FIGURE 6: Resection of the tumor and confection of the skin flap, and elevation of the flap with preservation of the perforating vessel

the bone tissue. In addition, for good graft integration, a homogeneous receptor area is needed, different from that found after the resection of tumors.⁷ The flap transfer should take into consideration the location of the lesion: whether on the anterior or posterior side of the leg. The amount of skin on the anterior face, that is, on the pretibial area, is smaller than that on the calf, which means increased difficulty in rotating the flap and/or closing the donor area. The inclusion of the regional perforating vessel in the flap, regardless of its design, means a safe vascularization.⁸ Its inclusion, however, must be planned prior to sur-

gery, either by anatomical knowledge or by locating it through a vascular Doppler test.² The latter is more frequently used when the flap is mobilized in a helical form.⁹ The planning of a flap at the lower extremity without the location of the perforator does not impair its use, but limits its extension and the arc of rotation, which becomes more vulnerable to tension and eventual necrosis. Cutaneous flaps used in superficial reconstructions of the lower limb may vary in size depending on the size of the lesion. Sometimes, depending on the location of the lesion, the amount of skin may not suffice to cover the recipient area and to close



FIGURE 7: Final appearance after flap rotation with leftover skin adjustments



FIGURE 9: Tumor resection and flap elevation, and dissection and isolation of perforating vessel



FIGURE 8: Skin tumor on the calf and planning of the rectangular rotation flap design (beginning at the most distal end of the tumor perimeter)



FIGURE 10: Final appearance after rotation of the rectangular flap with leftover skin adjustments

the donor area. Thus, skin grafts can be used in the donor areas. In regard to the shape of the flap, it should be chosen according to the location of the reconstruction.² The circular flaps have the advantage of being able to be rotated bilaterally, if necessary. The rotation of the skin flap that is based distally, however, leads to an increased risk of necrosis, especially in the most distal area of the leg.

CONCLUSION

The options presented for skin flaps for the leg are safe and easy to perform, being that circular flaps may be added with additional opposing flaps when necessary. ●

DECLARATION OF PARTICIPATION:**Douglas Haddad Filho:**

Conception and planning of the study. Effective participation in the orientation of the research. Elaboration and final revision of the manuscript

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Drafting and revision of the manuscript

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