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Particularities of the neurosural flap in covering cutaneous substance loss in the elderly: About two cases

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Abstract

Skin defects of the lower limbs are difficult to treat due to the presence of other associated lesions, notably the exposure of bone and tendons and due to vascular precariousness; all the more serious in the elderly whether or not they have other comorbidities.

In this article we present two cases of patients each aged 60 and 63 years, the first without associated comorbidities had a post-traumatic loss of substance of the ankle, the second hypertensive and diabetic with chronic arteriopathy had an arterial ulcer of the leg, in the In two cases, the coverage was achieved by the neurosural flap with a distal pedicle, the pedicle of which we shortened in the second case to reduce the risk of anticipated vascular damage.

The evolution was without problem in the first case then as expected in the second case we had a peripheral necrosis with fortunately preservation of the central part covering the bone which ended up healing in a controlled manner after failure of the skin graft of the peripheral parts of the flap.

Conclusion: Despite its reliability and technical simplicity, the neurosural flap can present difficulties in development, particularly in the elderly with or without comorbidities, these difficulties did not prevent us from practicing it in our elderly patients, especially since it was the simplest in terms of patients, so we believe that this type of flap still has its place in elderly patients or patients with comorbidities.

Keywords: Vascular, believe, despite

Introduction

Given that advanced age is a cardiovascular risk factor, the choice of the neurosural flap in covering cutaneous defects of the lower limbs is more “risky” in terms of failure and complications ^[1], however in certain situations, particularly in elderly subjects with or without comorbidities, this flap remains the most suitable for loss of cutaneous substances in the lower limbs and the simplest in relation to the surgical consequences and the cost of scarring.

Patients and Method

▪ Patients

In this work we report two cases of elderly patients who had a loss of cutaneous substance of the lower limb, the coverage was achieved by the neurosural flap with a distal pedicle, the evolution was different between the two although leading to healing and definitive coverage. in both cases.

▪ Method

Coverage was achieved by the neurosural flap with a distal pedicle; postoperative monitoring focused on the vascular state of the flap, its integration as well as the donor area.

The bibliographic resources adopted are PubMed, direct science.

The technique used was that of Masquelet ^[2]. This technique includes some specific, well-codified points. The patient is placed in the prone position, allowing better exposure of the donor site. The final trimming of the recipient area allows the size of the flap to be precisely adapted. This is slightly oversized by 5 mm, or even 1 cm when the fat panicle of the calf is large, to reduce the tension of the flap after suture. The space between the two gastrocnemius muscles and the inter achilleo-malleolar space materialize the axis of the pedicle.

The pivot point is noted between 5 and 7 cm above the tip of the lateral malleolus. The skin blade of the flap is then placed in height according to the length of pedicle to be given. Harvesting the skin blade of the flap begins with a proximal transverse incision through which the centering of the sural pedicle is checked and, if necessary, the design of the flap is modified. The flap is lifted, taking away the gastrocnemius aponeurosis and the subcutaneous fatty tissue. The fascio-subcutaneous pedicle is taken wide: it maintains the width of the flap at the level of the skin blade and the entire inter- Achilleo -fibular space distally. The vessels are perfectly visualized by transparency on the deep side of the pedicle. The dissection stops retrograde at the level of the perforator, regular, retromalleolar with the peroneal network. The flap is left in place after releasing the tourniquet to promote the establishment of blood flow and check for recoloration and bleeding of the skin blade; however, in the second case the tourniquet was not used due to vascular fragility. Once the flap is sutured to the edges of the defect, the fascio-subcutaneous pedicle is buried under an open bridge, the donor area of the flap is reduced by a bursa then grafted with semi-thick skin. A non-compressive dressing is applied, fenestrated, allowing monitoring of the flap care consisted of a prescription for antibiotic therapy based on amoxicillin + clavulanic acid for 8 days, analgesia with paracetamol, low molecular weight heparin therapy at an isocoagulant dose, elevation of the lower limb and medical care local first on post-operative day 1 then every

other day until healing.

Clinical Cases

The first case is a 60-year-old patient with no particular pathological history who had a loss of skin substance at the posterior surface of the ankle exposing the partially severed Achilles tendon (Fig1a), after debridement the coverage was carried out by the neurosural flap has a distal pedicle (fig1b), the donor area was covered by skin graft, the postoperative course was good without necrosis, healing was achieved in two weeks (Fig. 1c)

The second case is a 63-year-old patient who is a chronic smoker and diabetic; and arteritic having undergone two arterial dilatation procedures of the femoral and iliac arteries and a femoral bypass presented an arterial ulcer of the lower third of the left leg exposing the anterior tibial tendon and the facing tibia (Fig2A), after trimming the cover was performed in the same way by the sural flap with a distal pedicle, the pedicle of which we shortened by rotating the paddle on the inner side of the leg to reduce the risk of vascular damage (Fig 2B), however the flap had presented arterial damage on the first postoperative day then venous (Fig2C) the following days leading to necrosis of the flap on almost half but the most important useful central part which covered the bone remained unscathed (Fig 2D) thus we were able to have total healing of the loss of substance after necrosectomy and follow-up in directed healing for 6 weeks (Fig. 2 E).



Fig 1: Perte de substance cutanée traumatique de la cheville. [a] : Image préopératoire avec trace du lambeau [b] après levée et mise en place du lambeau [c] résultat définitif après cicatrisation



Fig 2: Perte de substance cutanée d'origine vasculaire de la jambe. [A] : image préopératoire avec trace du lambeau [B] après levée et mise en place du lambeau [C] Souffrance vasculaire [D] nécrose périphérique [E] cicatrisation après necroséctomie au bout de six semaines

Discussions

The distal pedicle neurosural flap is recognized for its reliability and technical simplicity; it is a reliable alternative to the rest of the muscular and fasciocutaneous flaps of the leg and which remains very undemanding on a technical level [3, 4, 5], however in certain situations it can present complications, particularly in the elderly and/or having comorbidities; thus, age has been recognized as increasing the risk of failure; for Baumeister *et al.* [1] he was 40 years old with a tendency for necrosis to increase with age.

In our two patients the indication was made despite the risk given their advanced age; this is due to the fact that this type of flap remains, despite everything, the only simple solution whereas free muscular or musculo-cutaneous flaps would be even more complicated and –risky.

The role of comorbidities was also an important factor in the second patient, which emerges in the series by Levante *et al.* [6] where 59 cases were studied showing a rate of necrosis in 68% of patients with at least one associated comorbidity (diabetes, hypertension, smoking that has not stopped or too recently, arteritis, cirrhosis) compared to 22% in patients without comorbidities.

This clearly explains in part the difference in evolution between our two patients; thus showing a greater effect of comorbidities in relation to age between the two cases.

In another series by Y. ABOUAINAN *et al.*, 15 cases were studied, more than half of which had vascular involvement while the success rate was almost total except for two cases of epidermolysis with no impact on the development of the flap [7].

We also believe that other factors were involved in the second patient, notably the dimensions of the skin palette, a factor also revealed in the series by Levante *et al.* [6].

The first signs of vascular distress in our second patient appeared in the first 24 hours and were of arterial origin, which could be explained by the patient's arteritic condition; venous congestion, the main drawback of this flap was noted 48 hours later, leading to peripheral necrosis over 2 cm while the central part of the flap remained unharmed covering the bone and having covered the rest by directed healing after failure of skin grafting from the periphery of the flap.

Conclusion

The neurosural flap is one of the most interesting flaps for defects in the leg and foot; however, its implementation in vascular or arteriopathy areas must be well thought out in terms of benefit-risk; nevertheless in certain situations its indication seems essential despite the fragile vascular terrain of the patient.

Conflict of Interest

Not available

Financial Support

Not available

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