CARDIOLOGIE TUNISIENNE

CASE REPORT

Neuro-cutaneous reverse sural flap coverage of the heel in an arteritis patient

Couverture du talon par lambeau sural inversé neuro-cutané chez un patient artéritique

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Summary

The sural neuro-cutaneous flap allows its use in patients with arterial disease.

We report the case of a 63-year-old patient with peripheral arterial disease, with necrosis of the left heel, due to stenosis of the femoral artery.

After endarterectomy and necrosectomy of the heel, it progressed to necrosis. A femoro-popliteal bypass was performed, and post-operative recovery was marked by improvement, and the granulation tissue formation.

A sural neurocutaneous flap, from the leg, was used to cover the wound. One month later, the sites healed completely.

Keywords

Coverage, tissue defect, neuro-cutaneous flap, peripheral arterial disease.

Résumé

Le lambeau neuro-cutané sural permet son utilisation chez les patients atteints d'artériopathie.

Nous rapportons le cas d'un patient de 63 ans, artéritique, présentant une nécrose du talon gauche, secondaire à une sténose fémorale. Après endartériectomie et nécrosectomie, il a évolué vers la nécrose. Un pontage fémoro-poplité a été réalisé. Les suites opératoires ont été marquées par la formation de tissu de granulation. Quinze jours plus tard, un lambeau neuro-cutané sural, prélevé sur la face postérieure de la jambe, a été utilisé pour recouvrir la plaie. La cicatrisation était complète.

Mots-clés

couverture, défect tissulaire, lambeau neuro-cutané, artériopathie.

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INTRODUCTION

Ulcers and tissue defect are frequent in patients with peripheral arteritis, especielly in case of critical ischemia.

Sural flaps are versatile and effective methods for reconstruction and coverage of the distal leg wounds and tissue defect in these patients. They include the sural fascio-cutaneous, sural artery neuro-cutaneous, or superficial sural neuro-cutaneous flaps [1]. The choice of the flap depends on the surgical team experience.

We report the case of a successful coverage of a heel tissue defect after necrosectomy in an arteritic patient.

CASE REPORT

A 63-year-old patient, smoker, diabetic since 10 years, was admitted to our department for peripheral arterial disease of the lower limbs stage IV. It had an infected necrosis of the right limb, related to a tight stenosis of the distal common femoral artery, and an occlusion of the superficial femoral artery (figure 1).

Figure 1. Pre-operative CT scan showing the tight stenosis in the right common femoral artery.

He underwent surgical thrombo-endarterectomy of the femoral bifurcation, combined with a necrosectomy of the heel. The local outcome was not favourable, with delayed granulation tissue formation.

Post-operative CT angiography showed poor distal opacification.

So, a prosthetic femoro-popliteal bypass was performed.

The post-operative course of the bypass was favorable locally, with the beginning of granulation tissue regeneration (Figure 2).

Fifteen days later, a sural neurocutaneous flap with preservation of the sural nerve and the small saphenous vein, was used to close the wound (Figure 3).

The patient was seen one month later, and the physical examination revealed complete healing of both the recipient and donor sites.

Figure 2. Photography showing the marking of flap harvesting sites

Figure 2. Photography showing the suture of the donor site by a skin graft.

DISCUSSION

Lower extremity soft tissue defects present reconstructive challenges, particularly when underlying structures such as tendons, bones, and neurovascular bundles are exposed [2]. Local and regional flaps serve as viable alternatives.

The sural flap was first reported by Pontén in 1981 [3]. Then, it has become a popular form of coverage. It is based on the median superficial sural artery, which allows for retrograde perfusion from the peroneal artery via distal perforators [4].

Reverse sural artery flap is among various flaps proposed for the reconstruction of the distal leg, ankle, and foot defects.

These neuro-cutaneous flaps and the perforator-based pedicled propellers flaps, are part of the first lines of treatment for defects in this area. They are relatively easy to perform, and are considered a good option for reconstruction. They minimize the damage at the donor site [5]. It has a wide arc of rotation, which allows for coverage from the lower half of the leg up to the metatarso-phalangeal joints on the dorsal aspect and base of the metatarsal bones [6].

The vascularization of these flaps receives a vascular supply from peri-nervous and peri-venous plexuses [7]. Regarding the venous return, the main issue is the presence of one-way valves at the short saphenous vein.

The anastomosis or ligation of the small saphenous vein, as the existence of a thin skin blade under the skin paddle, appear to increase vascular reliability of these flaps [8].

Some clinical observations confirmed by Loonen's works recommend harvesting a large sub-cutaneous pedicle to include the concomitant veins [9].

The complication rates of these flaps are variable in studies. Tripathee S et al [10] published a systematic review including 2592 reverse sural flaps (2575 patients) from 27 regions. The most common complication in this analysis was partial flap necrosis, which was observed in 7.87% of the cases.

In the study of De Blacam et al [11], peripheral vascular disease, smoking, and diabetes did not correlate with an unfavorable outcome or increased complication rate

The other most common complication was venous congestion (3.05% of the flaps). So, it is important to examine the flap regularly, to detect early the signs of flap failure.

CONCLUSION

Sural flaps are an interesting and effective alternative, which allows reconstruction of soft tissue defects in the lower leg, mainly in patients with arteritis and patients with diabetic foot. Their arterial supply and their venous drainages are reliable and ensure the transfer of skin, fascia, and muscle to the distal third of the lower limb.

Surgical or endovascular revascuarization by angioplasty or bypass improves the survival and the healing of these flaps.

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