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Results of ankle and foot skin loss coverage with sural flap at regional hospital of Sokode

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Abstract

Introduction: The objective was to report on the clinical and evolutionary aspects after coverage of post-traumatic skin loss of the foot and ankle with a sural flap at the Sokodé Regional Hospital.

Patients and Methods: This was a retrospective study of 17 patients aged > 15 years managed from July 1, 2019 to July 30, 2023, a period of 48 months in the Orthopaedics Department. These were open malleolar fracture in n = 09 cases and tibial pilon fracture n = 05 cases and open forefoot fracture in n = 03 cases. The sural flap was performed in all cases, as a cross leg flap in 02 cases. The parameters reported were operative time, clinical appearance at 03 weeks, at 03 months, flap weaning time, and appearance of the donor zone at 03 months.

Results and Discussion: The average operating time after the first surgical trimming was 02 weeks. At 03 weeks post-operatively, good flap take-up was noted in n = 13 cases, and skin damage to the flap edges with partial necrosis in n = 04 cases. At 03 months, good flap integration was noted in all cases (n=17), with healing of the donor area. Flap weaning was effective in only n = 07 cases

Conclusion: The sural flap provides reliable coverage of ankle defects, avoiding osteoarthritis and amputation. This easily reproducible procedure should be mastered by every orthopedic surgeon.

Keywords: Open fracture, flap, sural, distal pedicle, cross-leg

Introduction

Foot and ankle injuries are relatively common in traumatology [1, 4]. They affect young adults, generally males [5].

In sub-Saharan Africa, urban and rural traffic is dominated by two-wheeled vehicles. The lower limbs are thus exposed to open lesions. Foot and ankle injuries account for around 10% of limb injuries [6, 7].

Vascularization is precarious, and the violence of the impact explains the risk of infectious complications and even amputation [8, 9]. Poor prognostic factors include alcohol and tobacco consumption, diabetes and osteoporosis [10, 11]. In the case of osteoarticular damage, care must not only prevent infection, but also ensure good joint congruence and a pain-free joint, in order to restore limb function [8].

To achieve this, skin-covering procedures play a key role in management [12, 13].

The aim of this study was to report on the clinical and evolutionary aspects after coverage of post-traumatic skin loss of the ankle and foot with a sural flap at Regional Hospital of Sokode.

Patients and Methods

This was a retrospective study including the period from July 1, 2019, to June 30, 2023, i.e., a duration of 48 months in the Orthopedics Department of the Sokode Regional Hospital Center in Togo.

Patients

The study population consisted of 11 men and 06 women whose mean age was 35.29 +/- 10.19 years with extremes of 16 and 62 years. Circumstances were traffic accidents (n=11 cases), workplace accidents (n=05), gambling accidents (n=01).

The fractures were open forefoot fracture (n = 03), open malleolar fracture (n = 09) and tibial pilon fracture (n = 05). The antecedents were alcoholism in 04 cases, hypertension in 01 cases. No patient was a smoker or diabetic.

Criteria of selection

Patients aged > 15 years with an open ankle and/or foot injury with loss of skin substance requiring a covering procedure.

Operative procedure

- Initial surgical trimming was performed between 02 and 07 days. Covering was always performed at a distance from the initial trimming.
- The sural flap was performed on the homolateral side in 15 cases (fig 1) and on the hetero zambia side in 02 cases. At first trimming, the flap was removed and preserved in situ. Re-trimming was performed 01 week after the first trimming and the flap was repositioned. The third stage involved weaning the flap. The flap could be harvested with the skin (Fig. 2b) or isolated in the fascia (Fig. 1d)^[9].
- Restraint was by exofixation in n=07 cases, a transplant pin with multiple pinning n=04 cases and plaster cast n=06cases.

Evaluation items

Item included operative time, clinical appearance at 03 weeks and 03 months, flap weaning time, donor area appearance at 03 months, and complications observed

Results

Operative time ranged from 02 weeks to 05 weeks after the initial trauma. Flap harvesting time ranged from 45 to 65 minutes.

At three weeks after flap placement, flap congestion was noted in 05 cases, with edge necrosis in 02 cases (Fig 3).

The donor zone was left to heal in n = 11 cases. A thin skin graft was performed in n = 06 cases.

At three months' follow-up, healing and flap strength were good in all 17 cases (Fig 4). No complete flap necrosis was noted. Flap weaning was performed in 07 patients.

Figure format



Fig 1: a): Open distal tibia and fibula fracture with skin loss, b) and c): X-ray showing bones pinning, d) and e): Sural flap removal and application, f): Flap at 03 weeks after surgery with good fixation, g): Sural flap totally fixed but non-weaned

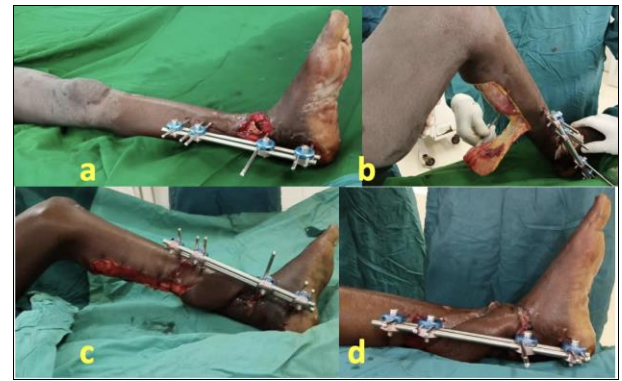


Fig 2: a): external fixation of ankle fracture showing medial skin loss, b) sural flap removal, c) and d) sural flap application



Fig 3: a): ankle medial skin loss after debridement of open ankle fracture with transplantar pinning, b-c): sural flap removal and application, d): flap view in operative room, e): flap after ten days with slight damage on margin

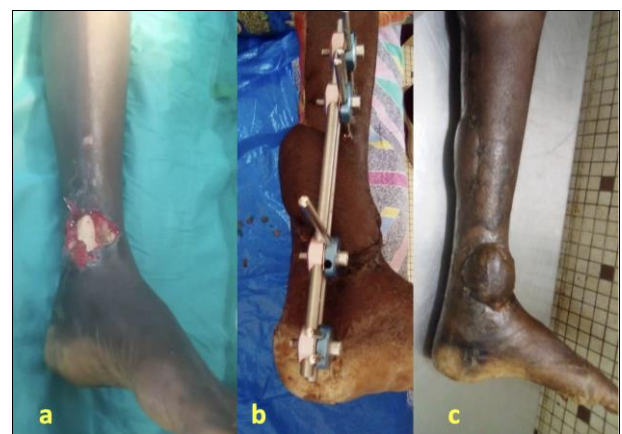


Fig 4: a): Loss of skin on medial part of ankle, b): Flap at 03 weeks of fixation, c): Good flap take after weaning and healing of the donor area

Discussion

We report a series of 17 sural fasciocutaneous flaps placed for post-traumatic substance loss in the ankle and foot.

Late management of open fractures of the ankle and foot puts patients at risk of osteoarthritis and amputations.

The use of the distal pedicle sural flap has been recommended by various authors for its reliability and low morbidity [12, 14, 19]. It can be used in the homolateral or heterolateral hamstring.

Poor prognostic factors reported in studies include obesity, diabetes, alcoholism, smoking and arteriopathies, which may increase the risk of microcirculation disruption and hence necrosis. This was reported by Levante *et al.* [20, 22].

As the study sample was relatively young, these factors were only marginally represented in the series. No cases of complete necrosis of the sural flap were found in the series. Other complications were similar to those reported in the literature [21, 23]: flap congestion and partial edge necrosis. These complications can be explained by the reversal of venous return. They were minor, since they did not compromise flap hold and healing. Failure to wean the flap has not compromised flap retention. However, it does create a gap that could be a source of infection. For this reason, the surgical procedure could be reduced to two stages, with the flap harvested and placed from the outset, and then weaned under local anaesthetic for patients with limited socio-economic conditions.

Conclusion

The sural flap with distal pedicle has made it possible to cover substance loss around the ankle and foot, reducing the risk of infection and avoiding amputation from the outset. We recommend this technique for similar lesions after sufficient debridement. The flap is reliable, easy to perform and accessible to all orthopedic surgeons.

Acknowledgments

The authors declare no conflict of interest.

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