INTRODUCTION:

Several authors have reported their clinical experiences with the sural flap, with favorable results. Even so, cases of partial or total loss still occur and can be related to factors such as errors in the flap dissection technique, patient comorbidities, the mechanism of trauma and the way the flap is transposed from the donor area to the recipient area.

The most common forms of flap transposition include flap tunneling or an incision in the skin between the donor and recipient areas, where the pedicle will be fitted. In the first form, the flap pedicle is folded over itself, generating a volume that is passed through a subcutaneous tunnel. In the second form, the pedicle passes between the margins of the incision. The risk of tunneling is pedicle compression, with attendant risks of venous congestion and flap loss. When the skin is cut to transpose the pedicle, there is no risk of pedicle compression by the skin; however, in addi
tional to local bulging, there is a need to use a skin graft to cover the pedicle. To avoid the previously described problems, we can perform a reverse sural flap, with temporary exteriorization of its pedicle, thereby preventing its compression and any damage caused by its transposition via tunneling or incision of the skin.

The goal of this study was to assess the outcome of a reverse sural flap with exteriorized pedicle, performed in 2 stages, regarding its viability and morbidity along the receptor area.

PATIENTS AND METHODS:

From 2010 to 2016, 11 patients who had coverage defects in the distal lower third of the leg, ankle or hindfoot were subjected to reverse sural flap with exposed pedicle. The average patient age was 39.25 years (min: 12 years; max: 72 years); the study included nine men and two women. Regarding comorbidities, one patient presented sequel of paralysis, and three patients were hypertensive, including one who was diabetic and another who had distal arteriopathy. The average size of the defect area was 6.6 x 28 cm. The average time that elapsed between the initial trauma and performance of the coverage was 42.72 days (min: 32 days; max: 64 days). The most frequent location of coverage failure was the laterral-malleolus (4 patients) (Table 1). All procedures were conducted by the same surgeon, always with the presence of clinical criteria that rejected active invasive procedures in the wound. The preoperative assessment was conducted with measurements of the flap and its viability as parameters before and after autonomy. Eventual losses were measured as a percentage of the total flap size. The length of skin that remained intact due to the applied technique was measured. The method of closing the donor area (i.e., with or without a graft) and ar
cymplications were recorded.

RESULTS

Flap autonomy was performed on nine patients 15 days from the first surgery date. One case presented suture dehiscence, which justified the need for revision, and another case could not be operated upon in the 15-day interval for logistical reasons; in that case, the autonomy was performed after 21 days. The respective mean length and width of the flap were 7.45 cm x 4.18 cm. Of the 11 patients, three presented partial loss of flap (cases 3, 5 and 6), with areas of loss of 20%, 20%, and 30%, respectively. All had the same pattern of loss, characterized by venous congestion, epidermolysis, loss of turgor and tissue necrosis. In two cases (cases 3 and 6), it was necessary to perform local grafting and, in the remaining case (case 5), there was second intention healing. The perfusion pattern of the flap remained the same in all cases before and after the vascular pedicle ligature. The average skin distance that remained intact between the base of the flap pedicle and the margin of the wound was 5.59 cm (min: 4 cm; max: 8 cm).

DISCUSSION

Exteriorizing the pedicle to prevent complications related to congestion, is not a new concept. In 2005, Maffi et al published a series of seven cases based on the "sural interpolation flap" technique.

The maintenance of skin integrity between donor and recipient areas is the main advantage of this technique and is especially true for small injuries that occur on the ankle and hindfoot. With conventional techniques, the grafted or tunnelled pedicle trajectory forms a large volume or a large scar, many times greater than the defect that the flap is proposed to cover. We consider this technique to be very influential for improving the final cosmetic aspect.

A possible disadvantage of the sural flap with exteriorized pedicle is related to the need for a second surgery for pedicle resection; however, during this surgical time, we can consider making an adjustment of the flap proximal portion along the receptor area, such as slimming, which can contribute to the final cosmetic aspect.

It is important to highlight that we do not consider the presented technique to be innovative but rather an improvement of the sural flap that enables a refinement of the results, with improved aesthetics and less chance for complications.

In conclusion, in our small case series of reverse sural flap with exposed pedicle, we observed that it is possible to combine the sural flap functionality with lower morbidity and a better aesthetic aspect without compromising the viability of the flap.

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