



ASSESSMENT OF FUNCTIONAL DISORDERS OF THE LOWER LIMB AFTER SURGERY

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Abstract

Purpose. Today we live in an era of speed with a growing rate of accidents, especially traffic that is associated more frequently with complex trauma, in particular of lower limb, is within the classification of type III open fractures B / C. These injuries are often accompanied by great loss of tissue in the leg, requiring complex reconstructive surgery.

Methods. I took the 158 study patients with complex lesions in the calf-ankle-foot defects were accompanied by significant loss of skin, muscle and bone, only those cases which required microsurgical reconstruction type. We selected and pursued these cases because of their severity, many of them to amputations limit, and trying to prove that the evolution of science by introducing microsurgery in orthopedics and emergency services can change the destiny of man, athlete or not.

Results. Thus at the patient hospitalization, mean limb function made up 28.36 ± 2 points for third proximal calf 24.17 ± 2 points for the middle third leg, and 20.12 ± 2 points for distal third leg.

At 18 months postoperatively, in the group of patients overall result was satisfactory. The average score of function in proximal third of leg was made at 5.09 ± 1 ($p = 0.029$), middle third of - 5.20 ± 1 ($p = 0.024$) and distal third of leg - 6.31 ± 1 ($p = 0.011$). Distal third leg was more modest final results compared to the middle and the proximal, which is determined by placing lesions in close proximity to the joint talocrurale.

Conclusions. Finally we can say that the assessment of lower limb functional disturbance shows that solving through reconstructive microsurgery techniques these serious cases with significant loss of tissue (skin, muscle, tendon, bone), leads not only to shorten hospitalization and reduce costs, but also a good psycho-social and professional reintegration.

Key words: lower limb, limb function, loss of tissue.

Introduction

Today we live in a fast paced era where the increasing rate of accidents, especially traffic accidents, is associated more frequently with severe traumas, serious lower limb injuries that fall into the classification of compound fractures type III B/C. Most of the times, these traumas are characterized by considerable loss of lower limb tissue that require complex reconstructive surgery (B. Ponten, 1981; M. Saint-Cyr, C. Wong, M. Schaverien, A. Mojallal, R.J. Rohrich, 2009).

The reconstruction of the soft tissue was performed at an early stage, within the first 72 hours in most of the cases, fact that lead to a decrease of the infection rate, lower costs and shorter admission periods for patients and better results on the long term. The surgical method to be used for resolving the defects is subject of the affected area, the type and seriousness of the injury, the patient's age and, in the case of professional athletes, whether they are considering continuing their sporting career or not (B.M. O'Brien, 1990; F. Zhang, W. Dorsett-Martin, K. Fischer, M.F. Angel, H.J. Buncke, 2001).

The study comprises 158 patients suffering from complex calf - ankle - foot injuries accompanied by serious tissue, muscle and bone defects; all cases required microsurgical reconstruction. We have screened and followed up these cases due to their complexity, many of them

risked amputation, and we have tried to demonstrate that the scientific evolution by introducing microsurgery when providing emergency orthopedic care may change one's destiny, whether an athlete or not.

In order to put together a Study Model regarding the functional evaluation of the lower limb, we have considered the following parameters (T.P. Whetzel, M.A. Barnard, R.B. Stokes, et al., 1997):

- Ankle immobility - dorsiflexion and plantarflexion - $90^\circ =$ position 0 - rated with 5 points = mobile ankle.
- Ankle stability - evaluated by using antero-posterior translations and rated with 4 points - stable = 0; stable but showing capsular ligament lesions; unstable, malleolus sprain; unstable, with fractures and sprains.
- Muscle force / movement activity - classically rated with 5 points, but in inverse proportion where the normal movement activity compared to the lateral limb is rated with 0;
- Muscle retraction - especially the Achilles tendon or muscle hypotonia (chronic cases) - rated with 5 points; lack of retraction = 0;
- Pain score - visual analogue scale - from 0 to 10, 0 meaning the lack of pain and 10 highest degree of pain.
- Skin sensitivity - 5 points - sensitive = 0, low hypoesthesia, mild hypoesthesia, severe hypoesthesia, insensitive, several skin areas

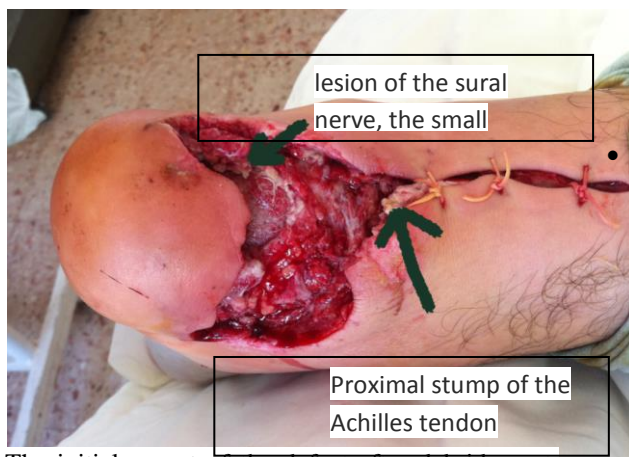
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affected.

Starting from ideal circumstances, that is a healthy limb = 0 points, and acute trauma with loss of soft tissue and bone = 34 points, we may evaluate the dysfunction of the injured lower limb according to the anatomic position of the lesion:

- When stationary, the average score of limb function was $28,36 \pm 2$ points for the third proximal part of the calf ($p=0,040$); $24,17 \pm 2$ points ($p=0,033$) for the third middle part of the calf; and $20,12 \pm 2$ points ($p=0,019$) for the third distal part of the calf.
- 18 months after the surgery, the overall result on the group of patients was satisfactory. The average score of the functions were: for the third proximal part of the calf $5,09 \pm 1$ points ($p=0,029$), the middle third $5,20 \pm 1$ points ($p=0,024$) and the distal third - $6,31 \pm 1$ points ($p=0,011$). The third distal part of the calf showed slightly less favorable outcome as compared to the middle and proximal ones, due to the fact that the lesions were in the vicinity of talocrural joints.

STUDY CASE. 23 years old male (football player), injured in a scooter accident, showing a severe heel wound at the outer malleolus, with a serious soft tissue defect (skin, muscle and Achilles tendon). Under the circumstances, it is decided to proceed with the cutting of the vascularized fasciocutaneous flap by fibular perforators. The wound shows a 4 cm defect of the Achilles tendon: **Figure1.**



- The initial aspect of the defect after debridement. The major Achilles tendon defect is noticeable, as well as the lesion of the sural nerve and the small saphenous vein.

Figure 2.



Perforator branches of the fibular artery

- A fasciocutaneous flap is cut in the shape of a „tennis racket”, two fasciocutaneous branches of the fibular artery are distally identified; these will vascularize the future flap.

Figure 3.



- Once the perforator flap is cut, it is then rotated around the identified vascular arteriovenous axis.

Figure 4.



- The flap is sutured to cover entirely the defect. The continuity of the Achilles tendon is made by



positioning the fasciocutaneous flap between its edges.

It should be noted that the Achilles tendon defect was solved by positioning and suturing the fascio flap to the two proximal stumps and distal of the tendon. The evolution is favorable and the both the tegument and the Achilles tendon defects are solved

To conclude, we may note that the evaluation of the dysfunction of the lower limb proves that solving these severe cases with serious loss of tissue (skin, muscle, tendon, bone) through reconstructive microsurgical techniques, as we mentioned earlier, leads not only to a shorter admission period and cost reduction, but also to restoring the patient's social, psychological and professional life in a positive manner.

Thus, I suggest my fellow colleagues to use surgery for immediately solving these injuries by making full use of the existing local and regional resources (perforator flaps) or by using the free tissue transfer (tissues removed from other parts of the body), and I hereby submit to you the functional results and movement recuperation of these patients.

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