

Contribution to the surgical treatment of infected tibial nonunion

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Given the very serious complications provoked by the infection of an open fracture, or by the surgical infection of a closed fracture, especially in the tibia, we thought it interesting to publish this note on the surgical treatment of infected pseudoarthroses of the tibia. We have been prompted to do so by the fact that over three years after the procedures were carried out no new infections or suppurations have been reported and the functional result has remained satisfactory.

TECHNIQUE

The procedure is carried out under general anesthesia and a pneumatic tourniquet. Locally, draping is used to prevent the loss of cutaneous substance; a sterile drape is used to protect the entire limb. The fibula is approached from its posterolateral aspect (fig. 1). The periosteum is removed of the parts of the fibula that correspond to the upper and lower fragments of the pseudoarthrosis. Using a long bit of about 5 mm in diameter, 4 paths are drilled that begin at the posterolateral aspect of the fibula and reach the anteromedial aspect of the tibial cortex. The direction is oblique, some 20-30 degrees with respect to the horizontal, bottom up for those corresponding to the upper fragment of the pseudoarthrosis, and top down for those corresponding to the lower fragment. Using a square file, the hole is made bigger so as to give it a rectangular shape, about 15 mm high and 8-10 mm wide. A tibial graft is obtained from the healthy leg, that should be as wide as possible (about 3 cm) and about 12 cm long. Four fragments about 6 cm long and 1.5 cm wide are obtained with an electric saw. These are introduced through the holes in the fibula and fitted into the tibia by means of an impactor (figs. 2 and 3). The wound is sutured by layers. Continuous redon drainage. Immobilization is achieved by means of a long-leg cast.

CASES

M. C., 49 years of age, married. Open fracture of the tibia and fibula. Fixation by means of several screws did not succeed in resolving the problem. Infection at the fracture



Figure 1. Incision.

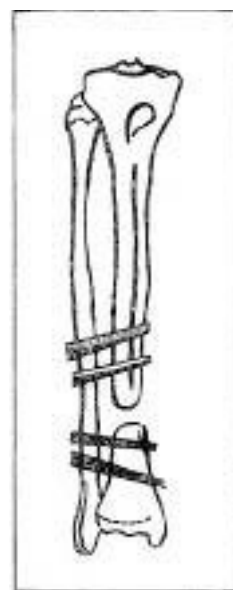


Figure 2. Graft placement.

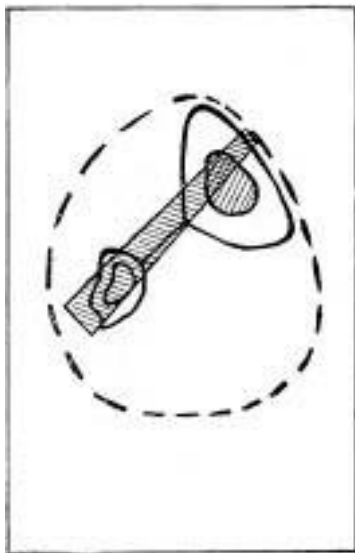


Figure 3. Graft placement.



Figure 5. Graft healing.



Figure 4. Case 1. Pre-operative images.



Figure 6. Healing of nonunion.

site. Several treatments: surgical cleaning, sequesterectomy, continuous perfusion and aspiration with antibiotics, Grafensteiner, etc. Twenty-five months after the fracture (30 nov 1962) tibiofibular grafts were applied above and below the site (fig. 4). "Preoperative x-ray (28 Oct 1962). Graft healing (fig. 5). (3 May 1965). The fracture has healed, the wound has remained closed and bone has regenerated in the area of bone loss (fig. 6).

J.M.S.A., 38 years of age, married. Fracture of the tibia and fibula. Incorrect intramedullary nailing. Infection. Twenty months after sustaining the fracture and after multiple attempts to address the fracture site the patient was op-

erated on 8th January 1962; tibiofibular grafts were used (fig. 7). Postoperative x-ray (8th December 1964) showing graft healing (fig. 8A y 8B). 3rd June 1965: healing persists in spite of a new trauma; the loss of cutaneous substance has cicatrized; the lost bone has all but regenerated itself (fig. 9).

COMMENTARY

We believe that the method proposed helps achieve the following results:



Figure 7. Case 2. Pre-operative x-rays.

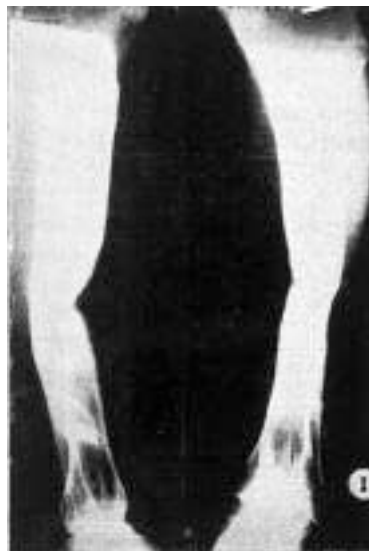


Figure 9. Healing of the nonunion.

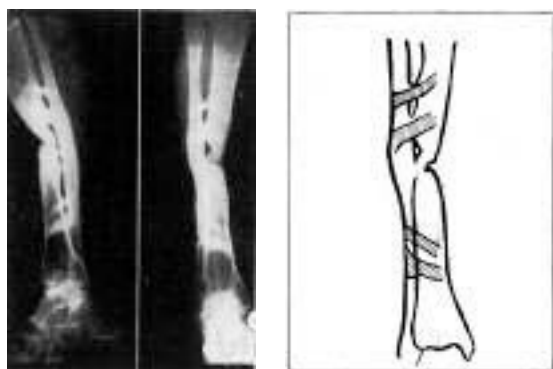


Figure 8A. Graft healing.
Figure 8B. Callus-healing.

1. Mechanical repose of the fracture site.
2. Revitalizing the bone margins with fresh grafts
3. Being able to operate away from the infected site.
4. Resolving the infection by immobilizing the pseudoarthrosis.

5. We believe that there is radiographic evidence that healing was successful and the greater development of the fibular shaft has contributed to giving way to a useful, powerful and solid limb.

SUMMARY

We would like to submit that, by means of the suggested method, i.e. the use of multiple tibiofibular grafts, it is possible to treat both the loss of bone stock and infection, since the healing of the grafts makes the limb stronger and mechanical repose favors the resolution of the infection. The main advantage of the method lies in the fact that the procedure is carried out at a distance of the infected area.

Commentary

Treatment of infected pseudoarthroses of the tibia remains a difficult-to-solve problem. Patients where lack of union and infection persist months after the fracture is sustained are as much of a problem today as they were when Dr. Jordá López wrote his paper.

The technique described by the author is based on concepts that are still regarded as Basic principles for treatment: stabilization of the pseudoarthrosis site and addition of a bone graft. According to the technique described, the tibial pseudoarthrosis is bridged using an autologous cortical

graft, away from the infected focus and taking advantage of the fact that the fibula is intact. Thus tibiofibular synostosis and stability are achieved.

Currently the standard treatment consists in open surgery to debride the pseudoarthrosis site and thus prepare the bone edges for healing. Intraoperative samples are cultured in order to identify the pathogenous agent so as to be able to administer the most appropriate antibiotic treatment. Immobilization is preferably carried out by means of external fixation. The bone graft will be reserved for use in an