

Percutaneous Osteosynthesis in Tibial Pilon Fractures: A Study Concerning a Serie of 8 Patients

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Abstract

Original Research Article

Minimally invasive medial plate osteosynthesis is a reliable method of treatment for tibial pilon fractures. This technique provides a high fracture healing rate and satisfying functional outcome with minimal wound healing complications. Sagittal plan deformity remains a common complication with minimally invasive medial plate osteosynthesis. The aim of this study was to evaluate the long-term follow-up and functional and radiological outcomes of minimally invasive medial plate osteosynthesis in distal tibia fractures concerning a serie of 8 patients.

Keywords: Fracture-Pilon-Percutaneous-MIPO-Plate.

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1. INTRODUCTION

Fractures of the distal end of the tibia are due to high-energy compression trauma axial. They are located in an anatomical region whose tissue envelope is thin and particularly exposed. Surgical treatment should ensure bone reduction that is as precise as possible while respecting the surrounding tissues. The osteosynthesis must be stable to allow early mobilization. Operative planning is an essential moment of care and is done by observation.

Rigorous clinical and exact radiological interpretation of the characteristics of the fracture. The complexity metaphysoepiphyseal of these lesions requires computed tomography imaging with reconstruction multiplanar. The development of anatomical implants with angular stability and the recent improvement definition of surgical approaches have clearly changed the prognosis of these lesions. Recognition of the importance of the free surgical interval before definitive osteosynthesis is the principle certainly having the most secure their care. In addition,

the possibility of a minimally invasive approach for certain fractures contributes to this securing.

2. RESEARCH METHODS

We report in this work the case of 8 patients, hospitalized in the Orthopedic Traumatology department for a fracture of the tibial pilon, during a period of 5 months from September 2022 to January 2023, and who benefited from osteosynthesis by percutaneous trefoil plate. The aim of this work is to evaluate the benefits of the MIPO technique in the treatment of tibial pilon fractures compared to open techniques.

3. RESULTS

With a follow-up of 4 months on average after the intervention, the results of the surgical management by MIPO technique in the fractures of the tibial pilon were very satisfactory. With less aesthetic damage, preservation of the fractured hematoma, shorter operating time and less use of antibiotics, the MIPO technique has demonstrated considerable advantages.



4. DISCUSSION

Over the past 15 years, the surgical treatment of fractures according to AO principles has undergone an evolution. The initial objective of treatment was to achieve a consolidation which allowed adequate

function without pain. A precise reduction and absolute stability with interfragmentary compression were conceived to provide a final, asymptomatic function of the affected joints. Borrelli proved how the risk of altering the vascular supply in the metaphyseal region

of the tibia was increased by conventional approaches. This led to the development of minimally invasive stabilization techniques. The first description of the development of percutaneous techniques through the application of a plate fixed to the bone in the superior and inferior parts of the fracture was carried out by Krettek. The objective of minimally invasive plate osteosynthesis (MIPO) techniques is to minimize the biological risk to soft tissues and decrease the rate of infection and pseudoarthrosis, offering a good functional result. The time until consolidation in our series was similar to that reported in published series of fractures synthesized using plates blocked by MIPO.

The mean time was of 17.08 weeks for the group of the plates and 14.56 weeks for the group of the screws which, although it did not represent a significant difference between groups ($P > .05$), did seem to indicate that the reduced aggression on soft tissues and preservation of bone vascularization could be favorable during the consolidation process. In our study of percutaneous techniques there were no cases of pseudoarthrosis and only 1 case of consolidation delay which achieved the union of fragments 10 months after the initial intervention. The fracture in this patient was initially synthesized with a medial plate, which requires a greater dissection of soft tissues. The fracture finally became consolidated without requiring a second intervention.

The type of anesthesia employed varied between general and subarachnoid. Patients were placed in the supine position on a radiotransparent table, where ischemia of the intervened limb was conducted in all cases. Preoperative antibiotic prophylaxis was applied in all patients.

5. CONCLUSION

Fractures of the distal tibia in adults result from trauma in axial compression associating a rotational component.

Extra-articular fractures involving the distal tibial metaphysis are differentiated from those affecting the articular surface, partially or totally. The former are treated with minimally invasive techniques (intramedullary nails, locked anatomical plates or possibly fixation external tibiotibiale), the seconds by open-hearth reduction.

The clinical evaluation of the tissue envelope is a critical point in their management. Placement of a

fixer external temporary is required in the majority of cases in the purpose of stabilizing the soft tissues and promoting the resorption of traumatic edema. A free interval of several days is observed before definitive osteosynthesis. The surgical approach depends on the precise type of fracture and the location of any skin lesions. Several approaches are possible, some of which have been detailed recently, offering strategies various to the surgeon. The advent of anatomical screw implants self-supporting nails and very distal locking nails considerably facilitates bone reconstruction, and contributes to the improvement prognosis of these lesions.

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