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Original Research Article

Tibial pilon fractures: management and evaluation of the outcome in mean and long term about 51 cases

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ABSTRACT

Background: the management of tibial pilon fractures is a real challenge in our regions.
Methods: This was a mixed study: dynamic from January 1 to December 31, 2013 involving 19 patients; retrospective from January 1, 2014 to December 31, 2018, covering 32 patients, received, treated and followed up for tibial pilon fracture in the Orthopedics-Traumatology department of the Donka university hospital center, Conakry Republic of Guinea. The clinical diagnosis was guided by the pain, functional impotence, a context of high trauma energy and confirmed by the X-ray of the ankle in antero-posterior and lateral views. The AO (association for Osteosynthesis) classification was used in our department.
Results: The average age was 36.21 years old with male predominance, the sex ratio was 5.4. The road accidents were the mostly found (86.27%). The motorbicycles were the mostly involved; the osseous lesions the mostly found were the type C according to AO classification (56.86%), followed by type B (33.33%). The orthopaedical treatment (27.45%), and surgical (72.55%). The ankle arthrosis was the most complication found (27.45%).
Conclusions: Tibial pilon fractures are rare but serious however the treatment depends on the anatomopathological type. The prognosis of these lesions remains always reverved in our context of lack of equipment in our hospitals.

Keywords: Ankle arthrosis, Osteosynthesis, Screwed plate, Tibial pilon, Fractures

INTRODUCTION

Tibial pilon fractures are articular metaphyseal epiphyseal fractures with a high potential sagittal instability. They are relatively rare, account for about 1% of all lower limb fractures and 5-10 % of tibial fractures.[1-7] Tibial pilon fractures are related to axial loads with high energy apply to the foot and ankle which lead to serious lesions of the tibial ceiling and soft tissues with metaphyseal comminution.[8] The functional prognosis is often defavorable, the surgical treatment remains the best option, however the success depends on the anatomical reconstruction of the articular surface.[9] Because of the complications of complex tibial pilon fractures there is a controversy in clinical practice regarding complex tibial pilon fractures in terms of the internal fixation choice and the treatment strategy.[10] The association for Osteosynthesis/the association for study on internal fixation (AO/ASIF) has proposed four principes for classic management of tibial pilon fractures, mainly the restoration of fibular length, the anatomical reduction of the articular surface, filling up the residual osseous defect with autologous spongious graft and stabilization of the medial column surface.[1-4,11] The purpose of our stud was to evaluate the outcomes of treatment of tibial pilon fractures.

METHODS

This was a mixed study: dynamic from January 1 to December 31, 2013 involving 19 patients; retrospective from January 1, 2014 to December 31, 2018, covering 32 patients, received, treated and followed up for tibial pilon fracture in the Orthopedics-Traumatology Department of the Donka university hospital center, Conakry Republic of Guinea.

Inclusion criteria

All patients received for tibial pilon fractures, treated, followed and evaluated in the department during the study period.

Exclusion criteria

Fractures of the distal end of the tibia in children, patients received for tibial pilon fractures who did not accept treatment, and patients lost to follow-up during outcome evaluation. The lesion mechanism was combined and complex, associating axial compression, to a rotation, a flexion or a torsion of the ankle. Clinically, the soft tissue lesions were classified according to Gustilo-Anderson. All our patients performed the X-ray of the ankle in antero-posterior and lateral views; sometime the 3/4 view was necessary for the diagnosis; the fractures were classified according to AO classification (Table 1).

Table 1: AO Classification of the tibial pilon fractures.

Types	1	2	3
43-A	Simple metaphyseal	Metaphyseal wedge	Complex metaphyseal
43-B	Pure separation	Séparation-compressiont	Multifragmentous compression
43-C	Simple articular, Simple metaphyseal	Simple articulaire, multifragmentous metaphyseal	Multifragmentous articular, multifragmentous metaphyseal

The management of the fractures was orthopaedical by external reduction and cruro-pedal casting; the surgical management was characterized by a reduction and Osteosynthesis by screwed plate or external fixation or screwing or combined treatment, associating two or three surgical methods. All the patients treated surgically received a rachial anesthesis. Installation was in supine position on the ordinary table and cushion under the homolateral ankle and buttock, tourniquet at the root of the thigh. The surgical approaches depended on the type of the injury (the quality of soft tissues and osseous fragments). Our results were evaluated after a hindsight of 24 months according to the clinical score of de De la caffiniere which gathers four criteria (tiboastragalar and subastragalar motion, pain, trophic disorder and walking) Our sources of data. Were the consultation and hospitalisation register of the patients, medical folders and operation registers. Our data were entered using Word and analyzed using Epi info version 7.2.

RESULTS

The data collected 51 patients: 43 men (84.31%) and 8 women (15.69%), with a sex-ratio of 5.4. the mean age was 36.21 years of age with the extremities of 20 and 79 years of age.

Table 2: Repartition of the patients according to the age groups.

Age groups (in years)	Numbers	Percentage (%)
<30	21	41,18
30-39	16	31,37
40-49	2	3,92
50-59	2	3,92
60-69	2	3,92
>69	8	15.69
Total	51	100

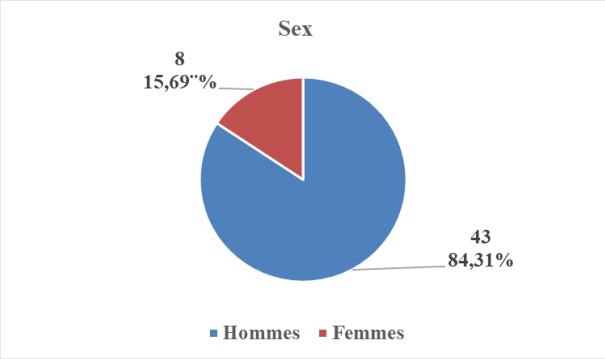

Figure 1: Repartition of the patients according to the sex.

The route accidents were the most causes found with 44 cases (86.27%), dominated by motor bicycles accidents in 38 cases (86.36%); the soft tissue lesions were dominated by the type 2 according to Gustilo-Anderson classification in 33 cases (64.70%); the osseous lesions the mostly found were the type C according to AO classification in 29 cases (56.86%), followed by type B in 17 cases (33.33 %). The orthopaedical treatment in 14 cases (27.45%), and surgical in 37cases (72.55%).

Table 3: Repartition of the patients according to the type of surgical treatments.

Surgical treatment	Number	Percentage (%)
Screwed plate	21	56.76
Screwing	2	5.40
External fixation	10	27.03
Combined	4	10.81
Total	37	100

The average stay was 27 days plus or minus 75 hours with the extremities of 5 and 67 days. In our study we noticed two categories of complications: the secondary complications (skin necrosis in 1cas, infection in 6 cases) and latest complications (ankle arthrosis in 14 cases, vicious callous in 6 cases, trophic disorders in 5 cases). After a hindsight of 24 months our patients were evaluated and we noticed the best and good results in 39 cases, average in 8 cases and bad in 4 cases according to the de la caffiniere criteria.

Table 4: Repartition of the patients according to the De La Caffiniere criteria.

Scores	Numbers	Percentage (%)
Best	12	23.53
Good	27	52.94
Average	8	15.69
Bag	4	7.84
Total	51	100

DISCUSSION

Tibial pilon fractures are rare and often occur after a high trauma energy and in the young person. In our study the average age was 36.21 years old and male predominance with ratio of 5.4. These results are conformed to those in the literature that can be explained by the hyperactivity of the young people in their socio-professional activities in order to satisfy their need' which expose them to work or route accidents.[1-3,12]

Tibial pilon lesions are classified by many authors.[13,14]In our study we used AO classification which seems to be more exhaustive, and the lesions were dominated by the type C, which necessitated a surgical treatment of these fractures. For these many methods were used, from a simple screwing of some type B, and passing by an anatomical plate, simple external fixation or combined in the types C3 which explain the difficulty of these fracture managements making the functional prognostic uncertain.[15] The complications were secondary, dominated by cutaneous necrosis and infection, respectively one case and three cases.[1,6] We performed a prelevement for a bacteriological study and antibiogram which allowed us to identify the source or sources of the infection and perform adapted anti biotherapy.

The latest complications, mainly vicious callous and tibio talous arthrosis were treated surgically, by osteotomy, reduction, and plate osteosynthesis (vicious callous), an arthrodesis (tibio talous arthrosis). Lesions from tibial pilon fractures are serious because of the trauma energy, with soft tissues crush. Exposing the skin to a secondary necrosis and soft tissue infection.[16] In these conditions the management of the fracture was delayed in order bestly manage the soft tissues and prevent les secondary complications like the necrosis. In the long term all our patients were evaluated. Which was possible thanks to the data base in which the telephone numbers were registered; which allowed us to call them back in order to evaluate them'. Our results were generally satisfactory. The poor quality of some radiographic images and the unavailability of CT scans in the department at the time of the study meant that we were unable to diagnose certain anatomopathological types with certainty. The absence of an image intensifier limited our ability to treat certain closed lesions.

CONCLUSION

In this study, it is concluded that tibial pilon fractures are commonly for young male patients, which is due to high energy trauma, and the management is mostly surgical with often some complications which make the functional outcomes reserved. The surgical treatment allowed to get satisfactory functional outcomes.

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