

EPIDEMIOLOGICAL FACTORS AND RESULTS OF THE MANAGEMENT OF OPEN LEG FRACTURES IN ADULTS IN RABAT**Omar Aguenau, Amine EL Maqrout*, Moncef Boufettal, Reda Lah Bassir, Mohamed Kharmaz, Moulay Omar Lamrani and Mohamed Saleh Berrada**

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ABSTRACT

This work reports a series of 178 cases of open leg fracture, hospitalized and treated at the Traumatology-Orthopedics Department of the CHU AVICENNE RABAT, for a period of 6 years from 2013 to 2018. Open leg fractures mainly affect males, with a percentage of 86.5%, and primarily concern young people aged between 26-35 years, i.e. 28% of the cases reported in our series. Their main cause is represented by road accidents, with a percentage reaching 80.8%. On the other hand, these fractures were classified as Type II according to the Cauchoix and Duparc classification in 41% of cases and as complex fractures in 70% of cases. In addition, surgical treatment interested 93% of our patients with predominance of the centromedullary nailing used at a rate of 53%.

KEYWORDS: Open fracture - leg – RABAT.**INTRODUCTION**

The fractures of the leg are very frequent and account for 15 to 20% of all fractures.^[1] The leg is the most frequent site of open fractures in adults (50% of cases),^[2] due to the subcutaneous location of the medial aspect of the tibia. Regardless of the degree of opening, it is always a surgical emergency.^[3] It involves functional prognosis and vital prognosis due to associated injuries.^[4,5] The causes of open fractures are the same as those of closed fractures, with a particular effect in two-wheeled accidents (high-energy trauma).^[6] In Morocco, the diffusion of certain means of transport such as scooters and the lack of respect for traffic regulations are factors that explain the high frequency of traffic accidents, which is the main etiology of these fractures.^[7,8,9]

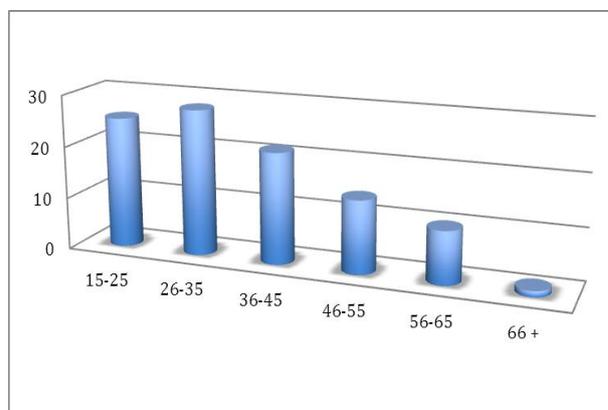
The aim of this work was to study the epidemiological, clinical, therapeutic and developmental aspects of open leg fractures.

MATERIALS AND METHOD

The authors report a retrospective study of 178 patients treated at the Traumatology-Orthopedics IBN SINA service in Rabat over a 6-year period, between January 2013 and December 2018. The study methods were based on the exploitation of medical records with collection of data from clinical examination, radiological data, surgical data and evolution in these patients.

RESULTS

The mean age of the patients was 37.16 years with extremes of 15 and 70 years. Patients aged 15 - 35 years were the most represented with 53.2% of cases (Fig 1). The predominance was male with 154 males versus 24 females, a sex ratio of 6.4.

**Fig. 1: Distribution of Subjects by Age.**

Road traffic accidents (RTA) were the main etiological circumstance (80.8%). The other etiologies were aggression (5.6%), domestic accidents (7.8%) and work accidents (4.4%). Fig.2

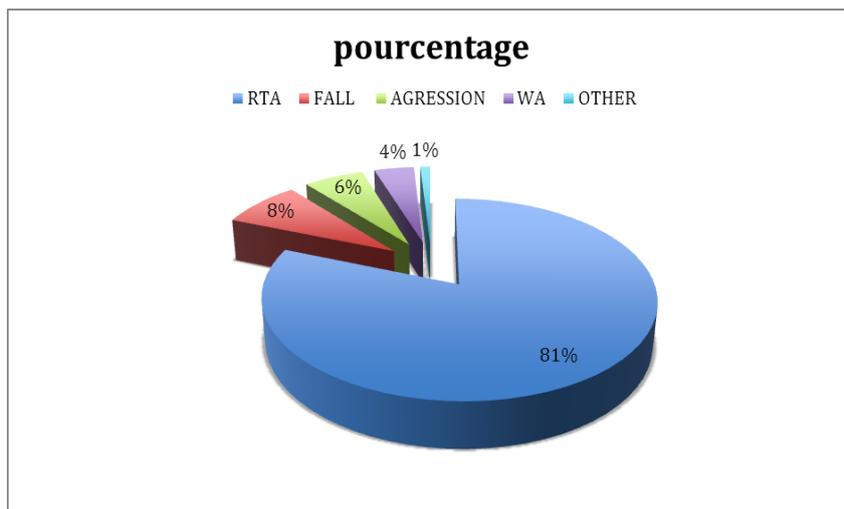


Fig. 2: Distribution by Etiology.

The type II opening of CAUCHOIX and DUPARC was predominant (41%), followed by type I (37.6%) (Fig.3).

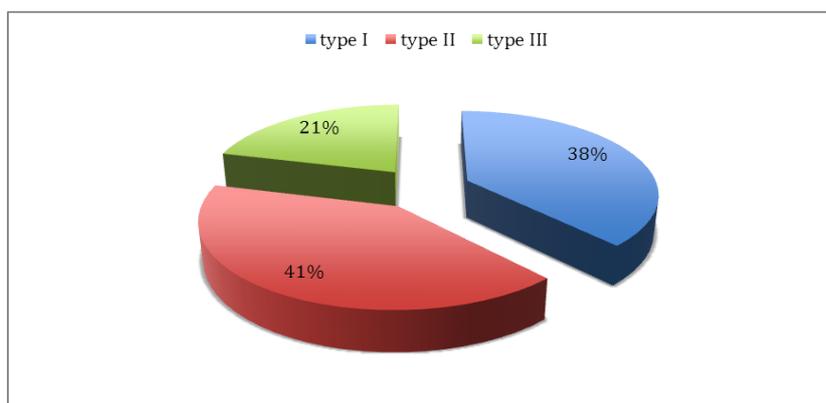


Fig. 3: Distribution of fracture opening according to Cauchoix and Duparc.

Most of the fractures were located in the middle 1/3 of the tibial diaphysis (37%); the upper 1/3 and lower 1/3 were found in 7.3 and 37.6% of cases respectively. Lesions were located at the union 1/3 proximal-1/3

medial and 1/3 medial-1/3 distal in 2.2 and 14.4% of cases respectively. The fracture line was often comminuted (39.4%) on the tibia (Fig. 4).

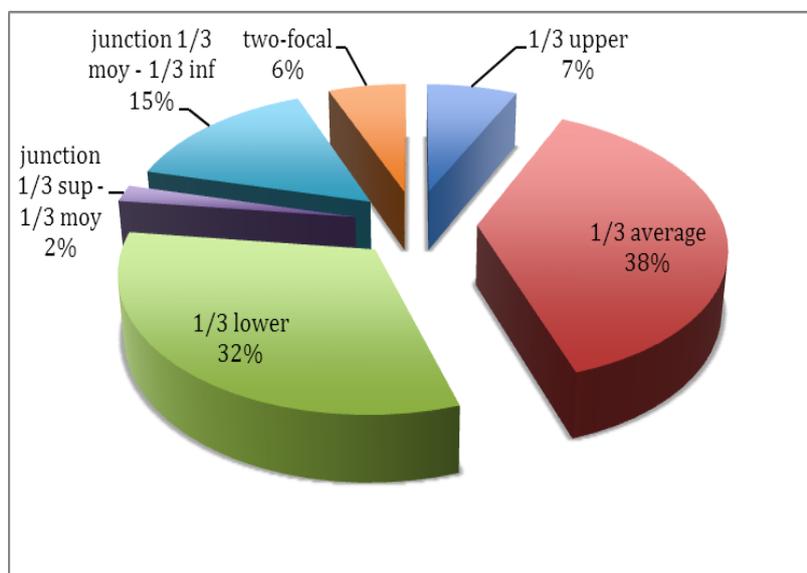


Fig. 4: Distribution according to the location of the fracture line.

All our patients benefited from drug treatment with serum and tetanus vaccine, analgesics, antibiotics, and anticoagulants. Likewise, decontamination and wound trimming were systematic. Suturing was done without tension.

Treatment was orthopaedic in 7% and surgical in 93%.

Fenestrated femoropedic plaster was the most commonly used orthopaedic method, while surgical treatment was dominated by double medullary centro-medullary nailing of the tibia (53%), followed by external fixator (33%) as shown in Table II. The fibula was osteosynthesized by stapling in 3 cases in addition to tibial osteosynthesis.

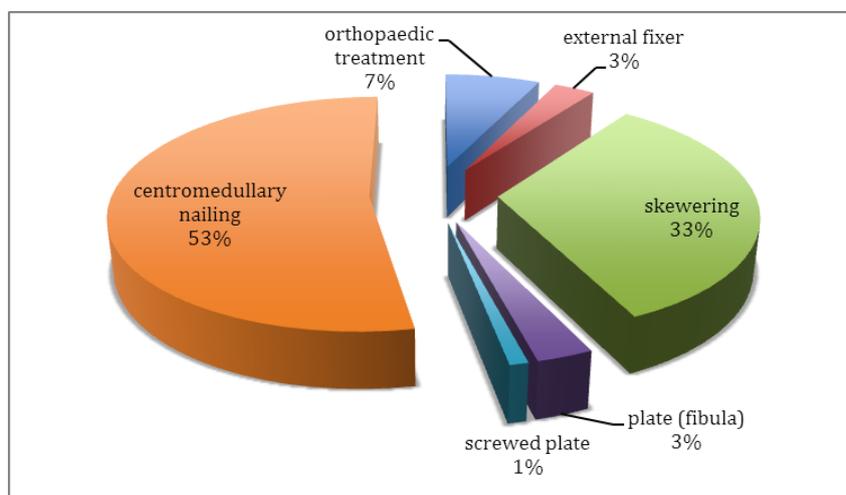


Fig. 5: Distribution by treatment used.

Secondary soft tissue management was required in 23 patients who received coverage for skin loss. These were: 20 skin grafts after budding, of 03 muscle flaps. A good catch of the skin grafts and flaps was noted.

The evolution in a general way was enamelled with complications in 101 patients, i.e. 67.3%. The various complications are grouped in table III. The most common complication was soft tissue infection, which was observed in 16 patients, i.e. 10.16% of complications, followed by secondary skin necrosis (4.6%). Soft tissue infections were controlled under local care or after surgical lavage; necrosectomies were performed for secondary skin necrosis often followed by muscle flaps or skin grafts after budding. Pseudarthrosis and osteitis required revision surgery. One case of amputation. The 8 vicious calluses were tolerable and did not benefit from correction.

The average consolidation period was 5.1 months with extremes of 4.1 and 12.1 months. Prior to 6 months, 77.2% of our fractures were consolidated. Between 6 and 10 months, 11.8% of fractures were consolidated and 11% of fractures were consolidated beyond 10 months.

Functional results were good in 67.3% of cases. These results were treatment dependent.

DISCUSSION

The average age of our patients was 37.16 years (15-70 years), so they were mostly young and active subjects. McQueen,^[10] and Thakore,^[11] found similar results with mean ages of 39 and 36 years respectively. The predominance was male with a sex ratio of 6.40. This

male predominance was also found by McQueen (68.9%) and Weber,^[12] These results could be explained by the fact that men are more exposed to trauma because of the activities they carry out.

These lesions are serious; in fact the type II skin opening according to CAUCHOIX and DUPARC was 41% followed by type I (37.6%). This can be explained by the subcutaneous situation of the tibia and the mechanism of the accident, which was often of the auto-motorcycle type. Our results are similar to those of Avilucea *et al.*,^[13] who found a type II opening according to Cauchoix and Duparc in 43.9%. Leg fractures occur mainly as a result of traffic accidents, which explains the high frequency of associated injuries. They often involve trauma to the head, pelvis or other injuries to the same limb or to the contralateral limb. For antibiotic therapy, we note that in all series, an antistaphylococcal antibiotic prophylaxis is used, the type of antibiotic differs from one series to another probably this depends on the availability and cost of the molecules. Doshi *et al.*^[14] Cephalosporin (96.8%) 8% infection.

Our Amoxicillin + Ac series. Clavulanic +/- Metronidazole 10.3%.

The effectiveness of antibiotic therapy depends largely on the delay in its administration, since a delay in the time of administration is a predictor of infection.^[15]

In our series the skin gestures concerned 23 cases are distributed as follows:

- Skin healing was spontaneous first-line in 83 cases, i.e. a percentage of 78.3%.

- A skin graft was necessary in 20 patients, i.e. a percentage of 18.8%.
- A fascio-muscular flap was performed in 3 patients, i.e. a percentage of 2.8%.
- A clear male predominance was observed, the most exposed age group is the active population, the main cause of this traumatic injury is represented by traffic accidents.

Anatomopathologically, a predominance of fractures of the average 1/3 was observed. Complex fractures are more frequent than simple fractures.

The stage II skin opening of Cauchoix and Duparc is most often found.

It is therefore important to remember: The open leg fracture is an emergency; it is the prerogative of major traumas, especially road accidents.

Its treatment must be urgent, complete and definitive: Ensure stabilization of the fracture site Treat skin and soft tissue injuries. Fight against infection.

CONCLUSION

Open fractures of the tibial diaphysis are high-energy traumas affecting young adults. The risk of complication is high and management is an emergency. The first steps of treatment consist of surgical debridement, stabilization of the fracture, and antibiotic therapy and tetanus booster. Because of the risk of infection and soft tissue damage, central medullary nailing is the treatment of choice in the majority of cases. The most important complications are compartment syndrome, infection, pseudarthrosis, thromboembolic disease and anterior knee pain.

Competing Interests

The authors declare no competing interest.

Authors 'Contributions

All authors have read and agreed to the final version of this manuscript and have equally contributed to its content and to the management of the manuscript.

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