

Distal Femur Fractures in Adults

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Abstract

Original Research Article

Objectives: To study the epidemiological, anatomopathological, diagnostic, therapeutic and progressive aspects of patients with distal femur fracture and compare our outcomes with those of the literature. **Introduction:** Distal femur fractures are the origin of sequelae such as osteitis, stiffness and osteoarthritis due to malunion or cartilage trauma. They are caused by high energy trauma, with a high risk of opening the site, or low energy in osteoporotic people. The anatomopathological types of these fractures are numerous, each one posing a different diagnostic and technical problem. **Materials and methods:** Our work is a retrospective study of 17 cases of distal femur fracture colligated in the department of Orthopaedic Surgery and Traumatology II, Mohamed V Military Hospital – Rabat, over a six-year period from 2012 to 2017. The average age of our patients was 45.64 years, with a male predominance of 76.48% of cases. A lesion association was found in 47.05% of the cases. Road accidents accounted for the most common etiology in 58.82% of cases. The classifications of SOFCOT (French Society of Orthopedic and Traumatological Surgery) and NORDIN have been adopted. Type IV simple sus and inter-condylar fractures were the most common in 35.29% of cases. Were the most common in 35.29% of cases? The treatment was surgical in all our patients. Different methods of osteosynthesis were used, the screw-plate DCS (Dynamic Condylar Screw) in 52.94% of the cases, the retrograde intramedullary nailing in 17.64% of the cases and the external fixation in 11.76% of the cases. All patients received postoperative functional rehabilitation. **Results:** Our outcomes were very good in 58.82% of cases, good in 23.52% of cases, and average in 17.64% of cases according to SOFCOT criteria. The complications found were: stiffness of the knee in 11.76% of cases, non-union in 5.88% of cases, sepsis on osteosynthesis equipment in 5.88% of cases and malunion in 5.88% of cases. **Conclusion:** Distal femur fractures are considered difficult fractures; however the majority of these fractures can be surgically treated successfully. This surgical treatment aims to mobilize early, allowing a better function of the knee.

Keywords: Fracture, Distal femur, Surgery.

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INTRODUCTION

Distal femur fractures represent less than 1% of all fractures and 4-6% of femoral fractures [1]. Their distribution is bimodal; they affect the young subject following a high-energy trauma and the elderly subject following a low-energy trauma [2]. These fractures are a cause of significant morbidity for the patient [3], their surgical management can be technically difficult [4] without any clear advantage of a particular type of osteosynthesis [5]. The procedure to be followed from the reception of the injured person to functional rehabilitation must be flawless at the risk of therapeutic failure [6].

MATERIALS AND METHODS

This is a retrospective study of 17 cases of fracture of distal femur fracture, taken in charge in the department of Orthopaedic Surgery and Traumatology

II, Mohamed V Military Hospital of Rabat, for duration of six years from 2012 to 2017. The study methods were based on the use of medical records with the collection of data on clinical examination, radiological, surgical and evolutionary data in these patients.

This study involved 13 men and four women with an average age of 45.64 years. The right side was affected in 58.82% of the cases. Bilateral involvement was found in only one case. Road accidents are the most common etiology (58.82% of cases). The SOFCOT and NORDIN classifications have been adopted. Type IV simple sus and inter-condylar fractures were the most common in 35.29% of cases. In our study the cutaneous opening was found in four cases, 23.52%.

The average time between reception and intervention was 32 hours. This allows the conditioning

of the patient. The operation was performed 13 times under spinal anesthesia; general anesthesia was performed in the rest of the patients. The treatment was surgical in all our patients. Different methods of osteosynthesis were used, the DCS screw-plate in 52.94% of cases (Figure 1), retrograde intramedullary nailing in 17.64% of cases and the external fixator in 11.76% of cases. Post-operative immobilization for 45 days by plaster cruro- pedal was recommended in four patients, 23.52% and by removable splint in the rest of the patients, followed by early and prolonged rehabilitation.

RESULTS

The results were analyzed according to functional and anatomical elements that are judged on the analytical criteria of the SOFCOT 1988 round table.

Functional and anatomical results were very good in 58.82% of cases, good in 23.52% of cases and average in 17.64% of cases. In our series of patients treated with DCS plate screw, 66.66% of them had very good and good results. Patients treated with retrograde intramedullary nailing, 66.66% of them had very good and good results. There were three types of postoperative complications: septic complication in a patient cured by ablation of osteosynthesis material (DCS plate screw) and antibiotic treatment, knee stiffness in two patients treated by arthrolysis of the knee with good evolution and a case of pseudarthrosis whose evolution was favorable after treatment with abrasion and cortico-cancellous graft taken from the ipsilateral iliac crest and osteosynthesis by screw plate DCS.



Fig-1: Standard X-ray showing a distal femur fracture treated by DCS screw-plate

DISCUSSION

Distal femur fractures are infrequent and are most often comminuted and articular [3]. The average age in our series is 45.6 years, this young age could be explained by the high rate of road accidents which mainly concerns the youngest subjects [2]. The majority of the series show a female predominance which goes from 63, 6% to 87, 3 % [7, 8], in our series, we have observed the opposite phenomenon, where men have been affected in 76.48% of cases, this is due to the mode of recruitment of our military formation. All our patients were admitted in the emergency, the initial clinical examination allows the elimination of a major lesion involving the patient's vital prognosis, and the evaluation of the neurovascular and cutaneous state of the traumatized limb as well as the search for other fractures in the pelvis and other limbs that may influence surgical management [3] We performed standard radiographs of all our patients, knee face and profile, ipsilateral femur and pelvis face. A preoperative computed tomography (CT) scan with frontal and sagittal reconstructions is sometimes useful for

analyzing fracture traits, and displacements and the diagnosis of condylar fractures are easily overlooked [9, 10]. A CT scan was performed in eight of our patients allowing a more detailed study of fracture traits and a three-dimensional reconstruction of the fracture. Orthopedic treatment has lost all its value in surgical techniques, and because of the multiple complications it is responsible for. Surgical treatment allows support and early rehabilitation. [11, 12] Surgical means include anterograde and retrograde intramedullary nailing, locked plates, external fixation and arthroplasty [5].

Whatever the material used, and the technique chosen, the surgical treatment is conceived only if it allows a perfect reduction of the epiphysis, a correction of the axis defects and a stable assembly [6].

The DCS screw-plate represents the osteosynthesis material most used in our study, since nine cases had this type of osteosynthesis, or 52.94%. According to some authors the results of this type of

osteosynthesis were excellent and good in 71-74% of cases [13-15, 9].

In our study the results of DCS plate screws were good and excellent in 66.66% of cases, and average in three patients, 33.33% of cases. Retrograde intramedullary nailing was used in three cases in our series, 17.64%, with very good and good results. KHAN *et al.* [16] treated 18 cases (19.16% of their series) by intramedullary nailing. According to literature data, locked plate and intramedullary nailing are effective therapeutic options in the treatment of fractures of the lower end of the femur [16]. First-line arthroplasty seems to be an interesting option, especially in complex knee joint fractures in elderly osteoporotic patients, because it saves the patient's life through early full-support recovery, which limits decubitus complications and save function through immediate joint mobilization without limitation, which limits the loss of autonomy [17] In our series, no case of first-line arthroplasty treatment has been performed. Khan *et al.* [16] performed first-line arthroplasty in one patient in their series (1. 1%).The precocity of the intervention is certainly a determining factor of the evolution of the patient except medical contraindication [18]. According to some authors [19, 20] the intervention was performed in the first 48 hours. In our study, we opted for early osteosynthesis with an average delay of 32 hours. An essential factor influencing the functional outcome is the precocity of rehabilitation [21]. In our series early rehabilitation was undertaken in 94.11% of our patients. Consolidation generally takes place between the second and third months and has been achieved in 95% of the cases in our series.

CONCLUSION

Distal femoral fractures are a source of considerable morbidity. The quality of the reduction is essential to optimize the chance of successful outcome. The main surgical implants are retrograde intramedullary femoral nails and variable angle locking plates, but the best treatment is currently uncertain. Answers may be forthcoming in large scale randomized controlled trials [22].

Conflicts of interest

The authors do not declare any conflict of interest.

Contributions of the authors

All authors have read and approved the final version of the manuscript.

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