

The value of arthroscopy in joint fractures of the lower limb

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Abstract

Introduction: Lower extremity joint fractures are common and require precise management to avoid complications. Arthroscopy offers advantages in terms of precise control, detection of associated lesions and minimally invasive surgery, thus improving post-operative outcomes.

Material and methods: The retrospective study focused on 51 cases of joint fractures of the lower limb treated by arthroscopy at the Ibn Rochd University Hospital over a period of four years including : 30 ankle fractures, 20 knee fractures and a single case of hip joint fracture. The pathological study was carried out on a radiological analysis and the fractures were then classified according to the appropriate classification.

Results: In the first case, a 16-year-old adolescent victim of a road accident suffered a postero-superior dislocation of the left hip, requiring emergency reduction followed by arthroscopy to remove three intra-articular foreign bodies. For the second case, knee joint fractures were observed in adults aged 20 to 55 years, mainly men, following road accidents. Surgical treatment included fracture reduction and internal fixation, with satisfactory postoperative results. Finally, in the third case, ankle joint fractures were observed in young and active adults, with a male predominance. Surgical treatment, carried out on average four days after the accident, also consisted of reduction of the fractures followed by osteosynthesis. Postoperative results were very positive, with rapid functional recovery and no complications reported.

Discussion: Joint fractures of the lower limb include those of the hip, tibial plateaus and ankle. For hip fractures, more common in young adults, reduction of dislocations is crucial, often carried out under general anesthesia. Tibial plateau fractures, observed mainly in young men, require precise detection of associated lesions, which are often difficult to identify initially. As for ankle fractures, common in active adults, precise imaging, such as CT, is recommended to guide treatment, including arthroscopic screw fixation in cases of syndesmosis damage.

Conclusion: Joint fractures of the lower limb are complex and require careful evaluation. Arthroscopy has revolutionized their treatment by providing precise assessment, direct reduction and treatment of associated lesions allowing rapid recovery and reduced post-operative risks compared to conventional surgery.

Keywords: Arthroscopy; Joint Fracture; Hip; Knee; Ankle

1. Introduction

THE fractures joints of member lower are of the lesions Frequently traumatic, they are the prerogative of traffic accidents. Their management remains a subject of concern due to post-operative complications in the short, medium and long term. Although they are characterized by anatomical - clinical polymorphism, these fractures must respond

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mainly to three imperatives: exposure operative minimum, the reduction anatomical and fixation stable. Over the last few decades, the management of joint fractures of the lower limb has undergone a revolution and considerable progress with the advent of arthroscopy. This technique requires a long learning curve and several technical requirements. The indication therapeutic depends of kind of fracture, of the lesions associated and on the ground. THE aim of our study East of to show there place of arthroscopic treatment in: control of the surfaces joints And SO of there reduction of fracture focus ; the precise injury assessment of associated ligamentous, cartilaginous and meniscal lesions Who born can be reveal by A balance sheet radiological standard ; reducing the delay operative in allowing a surgery mini invasive; reduction of risk infectious grace At washing articular And of minimally invasive surgery.

2. Materials and methods

Our work is a retrospective study of 51 cases of joint fractures of the lower limb, treated by arthroscopy, managed In THE service of surgery trauma-orthopedics Wing 4 of University Hospital Ibn Rochd of Casablanca on a period of four years. Among these fractures treated arthroscopically we found: 30 ankle fractures, 20 knee fractures and a single case of a hip joint fracture. The study anatomopathological has summer performed on a radiological analysis, and the fractures were then classified according to the appropriate classification.

Technique: All our patients were operated on under loco-regional anesthesia except 13% of ankle fractures under general anesthesia. We used an arthroscope, a shaver and other instruments. Joint exploration was systematic, making it possible to assess the severity of the lesions by studying the relationships between the bone and neighboring ligamentous elements. The first step of the intervention was the fluoroscopic control then after installation of the arthroscope and the irrigation system. It was necessary to carefully clean the joint which was the site of a hematoma. In our series we were not bothered by hemarthrosis. The average intervention time in our series was five (05) days. After placement of the arthroscope, the fragments are lowered using a pin or palpator .

Associated injuries : Concerning knee joint fractures, we have 12 cases of meniscal injuries, three cases of ligament injuries (ACL tear, ACL hemorrhagic contusion, ACL elongation and three cases of bone injuries (patella fracture, knee fracture). the fibular head , supra and inter condylar fracture of the femur). In the joint fractures of the ankle we observed five cases of osteochondral lesion of the talar dome, located at the anterolateral level, which went unnoticed on the radiological assessment, an injury to the anterior tibio -peroneal ligament and the rupture. syndesmosis was observed in seven cases , treated by screwing.

3. Results

3.1. Hip joint fractures

This is a 16-year-old patient, victim of a road accident, causing trauma to the left hip in whom the radiological assessment revealed a posterior superior dislocation of the left hip. There CT scan highlighted the presence of three intra-articular foreign bodies. There reduction of there dislocation in emergency has summer done by external maneuvers . Arthroscopy diagnostic and therapeutic on a patient in lateral decubitus (figure 1) revealed a rupture of the pelvic trochanteric muscles, in particular the twin and external obturator muscles, as well as a capsular defect between the pelvitrochanteric muscles, which was used to introduce the arthroscopic trocar. Three intra-articular fragments were objectified: two fragments at the expense of the femoral head and one fragment at the expense of the acetabulum which are non- osseo - synthesizable. They are removed, then closed on a suction redon drain.



Figure 1 Arthroscopic exploration

3.2. Knee joint fractures

The age of our patients varied between 20 and 55 years, with an average age of 39 years and a large male predominance with a sex ratio of 3 (15 men for 5 women). The accidents of there way public constituted etiology the most frequent. A standard radiological assessment was carried out as well as a complementary CT scan. with three-dimensional reconstruction. THE deadline of treatment has varied between three and seven days with a average of five days. All our patients have summer operated below anesthesia locoregional. Installed in supine position, on an ordinary table, a pneumatic tourniquet inflated at the root of the thigh. The image intensifier is systematically applied to allow front and profile checks. The arthroscopic approach its do by of the ways antero -internal, antero -external and a superior -external incision made to place a washing cannula. After joint washing by the arthro -pump (figure 2), the reduction was done either by external maneuvers or by endo -articular maneuvers: for fractures with low displacement the reduction was ensured by assembling the fragments separated by instrumental means using a hook or spatula or joystick (figure 3).

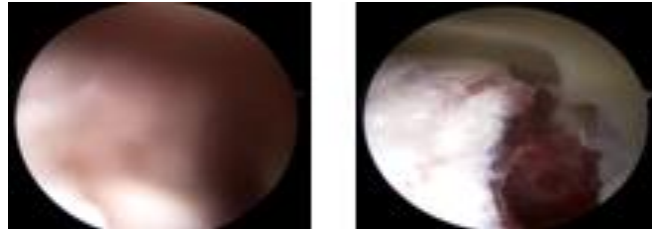


Figure 2 Arthroscopic exploration before and after washing

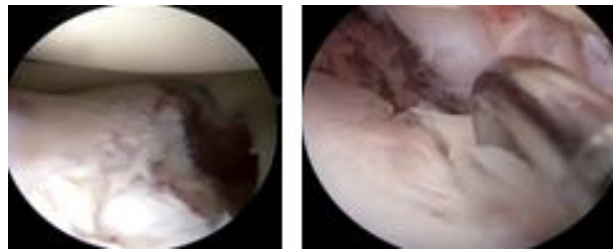


Figure 3 Fracture plateau tibial before and after reduction of their separation depression by hook and graft chase

There reduction For THE depressions important its done by A bearing fragments packed into a block using a trephine guided by a ligamentoplasty sight . The osteosynthesis performed was a screwing at the house of 14 cases, one plate anatomical at the house of 4 case and an association of the two at the house of 2 case (figure 4).



Figure 4 Good consolidation After osteosynthesis by plate and screwing

Meniscal suture was performed in 12 cases, two patients have benefited of a filling with of spongy bone. THE hindsight average of our series East of 24 months , we had results anatomical and functional (IKS score) satisfactory in 19 cases (score functional IKS : 89.5 and knee score : 88.5) and only one l case presented a hypo-reduction for a Type II fracture, the knee score was 75 and the IKS functional score was 85. reduction has summer judged excellent in 18 cases on there arthroscopic view and 16 case on there x-ray post operative. We we don't have observed none case of disassembly early or secondary.

3.3. Ankle joint fractures

The average age was 36 years with extremes of 18 to 64 years. The peak is between 20 and 40 years, which shows that ankle fractures occur mainly in young active subjects with a net predominance male (22 men for 8 women). THE deadline operative, was of 4 days In 27 case And has exceeded 15 days in 3 cases due to the non availability of material osteosynthesis, the arrival late of the sick has the hospital and troubles trophic. The standard radiological assessment was carried out followed by additional CT scanning (figure 5).

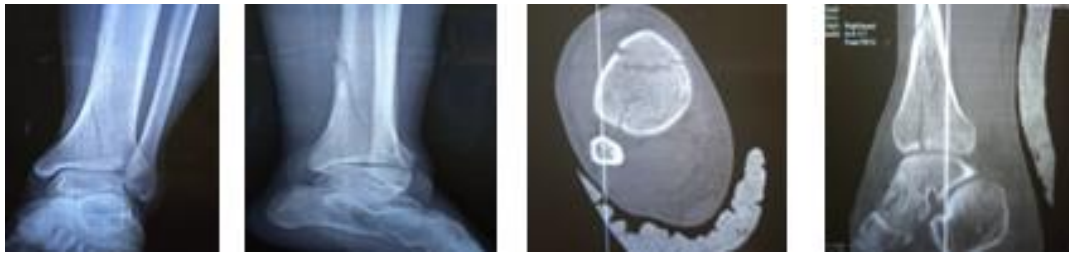


Figure 5 X-ray from the front and profile showing a fracture of pestle tibial and CT systematic For there fracture of tibial pestle.

The classifications of Duparc and Alnot as well as the AO were used and according to the site we have fractures of the malleolar clamp and fractures of the tibial pilon respectively dominated by bimalleolar fractures and type B fractures. Two types anesthesia have summer used : anesthesia general was carried out at the house of 4 case either 13% and spinal anesthesia was carried out at the house of 26 case either 87%. All patients were placed in a supine position on a table ordinary, with A tourniquet pneumatic has there root of member lower And a block under the ipsilateral buttock. Without arthrostress , ankle at the end of the table. The incision at the house of all our patients was done has through THE two ways classics and principals of ankle arthroscopy: the way antero - medial and way anterolateral. Joint washing , essential for everyone THE patients for better initial exploration and obtaining a complete lesion assessment consisted of injecting 10 ml of physiological serum anteromedially without the use of an arthro -pump (figure 6).

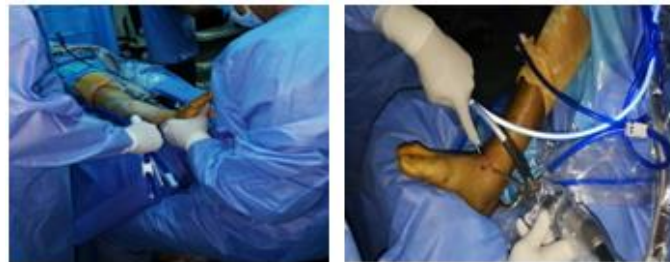


Figure 6 Operator At edge of there table in front him THE member of the patient; ways First of all arthroscopic of ankle

There reduction to summer made either by maneuvers external either by endo -articular maneuvers maintained by of the pins And verified below double control optical And fluoroscopic. Depending on the type of fracture, we have adopted several types of osteosynthesis, namely screw spongy cannulated, the screw spongy No cannulated, plate screwed, racking in, racking in guying (figure 7and 8).

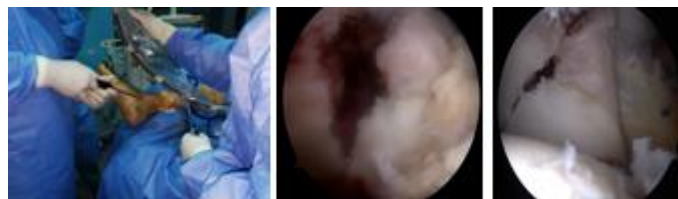


Figure 7 Screwing of the internal malleolus, arthroscopic view before and after reduction

The debridement has summer accomplished at the house of all our patients. There re-education has summer started the following day and support has summer authorized after 3 months hindsight minimum was 6 month. For the evaluation of our results clinics and functional, We have adopted the AOFAS score. There pain had totally disappeared at

the house of all our patients And THE score Average AOFAS was 98 postoperatively. All x-rays showed good results, and no complications were noted.

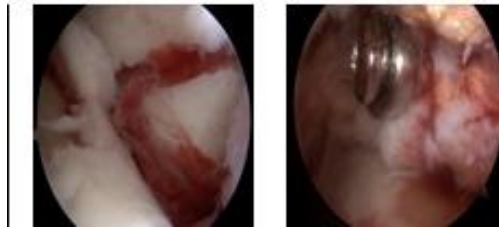


Figure 8 Arthroscopic view of the tibial pylon before and after placement of the cancellous bone screw

4. Discussion

4.1. Hip arthroscopy

Hip joint fractures in young adults have an average age of 28.3 years for fractures of the acetabulum and 31.1 years for those of the femoral head. General anesthesia is recommended for better muscle relaxation and supine position is described as the most commonly used position for patient setup. Reduction of a hip dislocation is considered an urgent procedure, although the optimal timing is debated. The BOEHLER technique is presented as a reduction method for posterior dislocations. Finally, it highlights the importance of arthroscopy to remove foreign bodies caused by traumatic dislocation, even in patients whose preoperative imaging studies are negative [1-9] [11-14] [47].

4.2. Knee arthroscopy

Tibial plateau fractures primarily affect young, active adults, with a mean age of 39 years in this study, and they are more common in men. Initial diagnosis is based on analysis of the mechanism of injury and functional symptoms, but associated ligament and meniscal injuries are often difficult to detect initially due to pain. Arthroscopy has become essential to comprehensively evaluate these lesions during surgery. Computed tomography (CT) with three-dimensional reconstruction is often necessary for accurate evaluation of fractures and embedded joint fragments. Preservation of the menisci is preferred when possible. Ligament injuries, particularly of the anterior cruciate ligament (ACL), are common and can have a negative impact on functional prognosis if left untreated. The surgical management of ligament injuries varies according to the authors and can be carried out in one or two stages [2] [15-33] [35-39].

4.3. Ankle arthroscopy

Ankle fractures, which can affect all age groups, are more common among young, active adults, with an average age of 36 years in this study. Initial symptoms include swelling and bruising with an inability to mobilize the ankle. Skin lesions are common and influence the choice and timing of treatment. Although vascular-nervous complications are rare, their early detection is crucial. Diagnosis is usually based on standard x-rays, but CT may be necessary for a more accurate assessment, especially in cases of tibial pylon fracture. The Duparc and Alnot classifications, as well as that of the AO, are often used to classify fractures. Osteochondral lesions of the talar dome can be diagnosed and treated by arthroscopic debridement. Syndesmosis injuries are common, and their treatment may require arthroscopic screw fixation. The patient's positioning and use of a pneumatic tourniquet are individually adapted depending on the fracture and the patient's morphology [40-45] [47-48].

5. Conclusion

THE fractures joints of the member lower constitute A pattern frequent to consultation in emergency, they are characterized by their complexity And by a difference in therapeutic techniques. The difficulty of evaluating these fractures explains the multiplicity of classifications. The anatomic-pathological type of each fracture must be carefully described, in se basant on a analysis meticulous of the x-rays standards, CT scans and/or magnetic resonance imaging. The management of these fractures has undergone a revolution with the advent of arthroscopy. Who has acquired his securities of nobility In there Traumatology fractured. She permits a approach different of these fractures compared to open surgery. Arthroscopy has the advantage of give A balance sheet articular complete And documented, a assessment direct intraoperative of there reduction, of the ways first reduced, a extraction fragments free And A debridement of the joint, Thus one treatment of possible lesions associated on THE even gesture operative. She is technically feasible, safe and reliable. Arthroscopy allow No only to improve THE results has short has AVERAGE and to

long term on the different plans, but also a early mobilization and a short hospitalization, All by reducing the postoperative risks and complications observed after open surgery.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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