

CASE REPORT: TREATMENT BY SCREW FIXATION OF AN OSTEO-CHONDROAL FRAGMENT ASSOCIATED WITH A DISLOCATION OF THE PATELLA AND REVIEW OF THE LITERATURE

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ABSTRACT

Fractures of the patella are serious articular fractures, since they can jeopardize the functional prognosis of the knee. The frequency is 0.5 to 1.7% of all skeletal fractures. Various surgical procedures exist, dominated by the technique of pinning and bracing. A recent numerical study has demonstrated the value of screwing with superficial screw placement, which provides better stability and lower wire loads and bone contact pressure than deep placement. We report on a particular case of a dislocated osteochondral fragment associated with a dislocated patella, following a sports accident. The dual-purpose procedure of reducing the dislocation and synthesizing the osteochondral fragment consisted of a triple screwing procedure without anterior thread with capsulomyoplasty.

KEYWORDS: Osteochondral fragment, patella dislocation, screwing, capsulomyoplasty.

INTRODUCTION

Patella fractures account for 1% of all skeletal fractures, with an incidence of 13.5/100,000 person-years. For displaced patellar fractures, surgical fixation is often required to maintain reduction of the fractured patella and function of the lower extremity extension mechanism.^[1] The goal of the operation is to facilitate anatomic reduction of the patellar fragments and articular surface to allow for stable fixation.^[2] Various surgical procedures cited in the literature: Kirschner wires with cerclage, interfragmentary screws and cannulated screws with additional cerclage, external fixation; we report a particular case of removal of an osteochondral fragment associated with a dislocated patella, the dual purpose procedure the reduction of the dislocation and the synthesis of the osteochondral fragment consisted of a triple screwing with capsulomyoplasty.

CASE PRESENTATION

A 15-year-old female patient was admitted to the emergency room with a closed left knee injury following a sports accident, a fall at the ice rink with direct impact on the knee.

Knee X-ray: presence of a bone fragment in the anterior sub-patellar area on the profile click



Figure 1: X-rays Frontal and lateral views showing the removal of the osteochondral fragment.



Figure 2: Intraoperative images of the removal of the osteochondral fragment from the inferomedial part of the patella.

CT scan of the knee showed a lateral subluxation of the patella with osteochondral fragment coming from the

posterolateral side of the patella and hematic joint effusion.



Figure 3: CT images showing an osteochondral fragment associated with a dislocated patella.

We initially suspected a fracture of the lateral epicondyle on the standard X-ray, but when we completed the scan of the knee, we found a dislocated patella.

At the preoperative examination, when the patella was mobilized, the bone fragment that appeared to be a fracture was mobilized with the patella, in fact, it was an osteochondral fragment at the expense of the patella with patellar instability. The surgical procedure consisted of a capsulomyoplasty to recenter the patella and osteosynthesis of the osteochondral fragment, The

reduction of the fragment was at the expense of the lower and internal part of the patella which is articular and then screwed in using 03 screws of 2.5 diameter and 24 mm in length, two screws going from the extra-articular side of the patella to the articular side and one screw going from the articular side to the extra-articular side, this screw was well buried in the knee so as not to disturb the articular surfaces, closure of the internal fin in a clamp; Testing at the end of the operation shows a stable patella, support was authorized under cover of a splint in extension worn for 06 weeks.

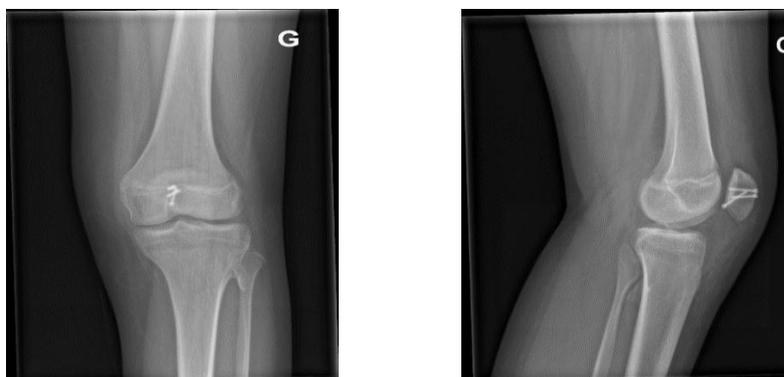


Figure 4: Radiological control at 02 months post-surgery of face and profile showing a consolidated focus with good joint congruence.

The evolution was characterised by a clean scar and a consolidated focus, physical therapy was started at the end of the 06 postoperative weeks.

DISCUSSION

The aim of the surgical fixation of the patellar fracture is to construct a rigid fixation for early rehabilitation soon after the surgical intervention.^[1]

The use of cannulated screws was introduced as a minimally invasive treatment approach to overcome the disadvantages of implant irritation by Kirschner wires.^[2]

Lin *et al* once reported that cannulated screw fixation in a minimally invasive manner had significantly improved clinical results compared to open reduction and internal fixation groups measured using the score. lower pain scores, early mobilization and a lower incidence of complications were also noted.^[3]

Biomechanical studies indicated that the tension band wiring was only able to transform the distraction force into a compression force and was not able to achieve direct fracture site compression. By contrast, percutaneous cannulated screws were able to provide a direct compression force among the fragments. These

screws were more stable and rigid for fracture fixation in the patella.^[4,5]

Therefore, certain studies demonstrated that stabilization of patellar transverse fractures with screws or screws with tension band sled to significantly reduced displacement.^[6] and soft-tissue irritation and a lower rate of hardware removal.^[7] than fixation with Kirschner wires and modified tension bands.

Since Sattler and Schikorski.^[8] first described percutaneous reduction and fixation with the assistance of arthroscopy for displaced transverse patellar fracture in 1987; The reduction and stability of the internal fixation was able to be confirmed with arthroscopy, particularly when flexing and extending the knee.^[9]

However, there were still certain limitations to arthroscopically assisted techniques. These techniques were not suitable for treating comminuted fractures with multiple and displaced fragments or disruption of the extensor mechanism.^[10]

Percutaneous cannulated screws are able to provide a direct compression force among the fragments with reduced soft-tissue irritation and a lower rate of hardware removal.^[2]

A new concept of applying an additional third screw to construct a triangular configuration with the traditional two parallel cannulated screws was proposed in a study by Chih-Wei Chang and All in 2020 to improve the weakness of superficial or deep screw placements.^[11]

The effect of the additional third screw on increasing the stability was especially obvious in the two parallel deep screws, particularly without the anterior wire, because the added third screw increased the ability to resist torsional loading on the fractured patella.^[11]

In addition to the improved stability, the use of an additional third screw has another advantage –the feasibility of minimally invasive surgery over the wire. The insertion of cannulated screw can be executed via minimally invasive techniques, whereas the wiring of the encircling of the wire often required open manners.^[12]

CONCLUSION

Fractures of the patella are serious joint fractures, as they involve put the functional prognosis of the knee; different surgical techniques exist using a minimally invasive or open approach; the percutaneous cannulated screw fixation technique was shown to provide satisfactory clinical results and excellent knee functions, with less pain and a low incidence of complications. This procedure could be a new option for the treatment of transverse patellar fractures.

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