Traumatic posterior hip instability and reconstruction with a femoral head allograft in a young man

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ABSTRACT

Introduction: Hip fracture-dislocations after a traumatic event are devastating conditions. As a result of the increasing traffic road accidents, the incidence of the hip fracture-dislocations raise. Most of the hip dislocations require surgical management especially in the presence of acetabular wall or femoral head fractures. If the primary surgical management fails, there are not many options for the revision of hip instability. Case Report: A 20-year-old drug addicted man, who had a traffic accident brought to our emergency department with a hip fracture-dislocation and posterior acetabular wall fracture. After a satisfactory surgical management patient had a second major trauma after eight months and the hip was unstable after this trauma. An allograft reconstruction of the posterior acetabular wall is made for this instability. Conclusion: The patient’s range of motion was very good and he had no complaint about his hip at the 22nd month follow-up. This technique should be kept in mind in rare cases in which the acetabular defect causing instability of the hip is not correctible with routine ways.

Keywords: Femoral head allograft, Hip dislocation, Instability

INTRODUCTION

Traumatic fracture–dislocation of the hip is an orthopaedic emergent condition requiring immediate reduction of the hip. Most of the dislocations occur posteriorly. The incidence of fracture–dislocations of the hip is rising as a result of the increased frequency of road accidents [1]. Traumatic hip fracture–dislocations are frequently associated with devastating complication. Degenerative arthritis of the hip, osteonecrosis of the femoral head, heterotopic ossification, and sciatic nerve palsy are the worst complications of this trauma. When the fracture of the acetabulum or the femoral head accompanies, surgical treatment of hip dislocation is mostly preferred [2].

Here we try to explain an unusual method of reconstruction of the acetabular posterior wall defect with a femoral head allograft in a young patient having unsuccessful prior surgical attempts.
CASE REPORT

A 20-year-old drug addicted man, who had a traffic accident, had been brought to our emergency room complaining of a deformity and pain in his left hip joint. Range of motion of hip joint was very limited and his left hip was externally rotated and a shortness of the left lower extremity was observed. Antero-posterior (AP) roentgenography revealed a posterior dislocation of hip and an acetabular posterior wall fracture (Figure 1). The hip was reduced with a smooth manipulation under sedo-analgesia in the emergency room. Computed tomographic (CT) evaluation after reduction of the hip showed an unreduced acetabular posterior wall fragment (Figure 2A and B). The patient was operated under general anesthesia via posterior approach in the third day of trauma. A 2 part fracture of the posterior wall was revealed and reduction of the wall fragments + fixation with a reconstruction plate was done. The range of motion of his hip was full and no instability was documented intra-operatively. Early postoperative view of his left hip revealed a satisfactory reduction (Figure 3A and B).

After the first operation, the patient didn’t come to any outpatient control to our clinics. At the eighth month of the operation, patient was brought to our emergency department after a fall from a high wall. The patient was complaining of left hip pain and deformity. The roentgenography revealed a dislocation of the left hip and re-fracture of the acetabular fragment (Figure 4).

Closed reduction of the hip under sedo-analgesia was tried; the hip reduced but it was unstable. A skeletal traction from the distal femoral condyle was performed and the patient re-operated after four days of the second trauma. Under general anesthesia, the hip and acetabulum were visualized by the same incision of the first operation. Reconstruction plate and screws were removed. A nonunion of the fracture field was revealed. One of the fracture fragments was reduced and fixated by two screws after curettage of the nonunion site (Figure 5). The hip was unstable after this fixation. Some degree of lysis of the other fragment was observed and it was not suitable for the stable fixation. A femoral head allograft from human being was reshaped and fixated to the defect of the posterior wall with three screws (Figure 6). The hip was stable in all range of motions of the left lower extremity intra-operatively.

The patient was allowed weight bearing at the first day of the operation, but excessive hip flexion and adduction was restricted for 6 weeks by an abduction hip brace. After twenty two months of the operation, patient had no hip complaint with having nearly full range of motion (Figure 7 and 8). In the control CT of his hip at 22nd month from the last operation, the union of the allograft was observed and no sign of early osteoarthritis was seen (Figure 9).

DISCUSSION

There are several studies demonstrating good results after surgical management of the hip fracture-dislocations. In a study by Rice et al, good to excellent results in 85% of patients after surgical management were reported [3]. Matta also revealed 82% good to excellent results after
Figure 4: Second dislocation of the hip at the eighth month of the first operation.

Figure 5: After fixation of the fracture fragment; the defect of the postero-inferior wall and the femoral head from this defect are seen. The hip was unstable with internal rotation, adduction and flexion in this time.

Figure 6: (A) Intraoperative view of the hip after reconstruction of the acetabular defect with a femoral head allograft. (B) The femoral allograft after re-shaping.

Figure 7: Anterio-posterio view of the hip at the 22nd month of the second operation.

Figure 8: The range of motion of the hip was nearly full, and the patient had no hip complain after 22nd month of operation.
good reduction with surgical care [2]. But acetabular open reduction and internal fixation is a very demanding surgery and unsatisfactory patient outcomes can be encountered in up to 30% of patients [4]. More than 2mm displacement after reduction is one of the major causes of poor outcome which cause rapid arthritis development [5]. Although the patient in our case is a drug addict and incompatible with our suggestions, up to the traumatic fall from a high wall, he didn’t have any problems with his hips and didn’t search for an outpatient care.

Femoral head osteonecrosis can affect 10 to 25% of patients after traumatic hip dislocations [3]. While some of the authors emphasize the duration between the injury and reduction of the dislocation for osteonecrosis development [6], some lay stress on impact of the primary injury [7]. Other factors affecting the development of femoral head osteonecrosis include direction and grade of dislocation, patient’s age and associated fractures like acetabulum [8]. In a study by Brav, it is reported that; radiographic signs of osteonecrosis could be seen within 2 years after the initial trauma [9]. The patient’s hip in our case was reduced in emergency room under sedoanalgesia in 2 hours of trauma and we didn’t see any sign of femoral head osteonecrosis (pain or radiographic changes) at the 22nd month follow up. According to Mitsionis et al, for patients with traumatic fracture dislocations, a 24 month follow up is sufficient to exclude the development of osteonecrosis [5].

Most of the old literature suggests the use of posterior approach in the surgical management of these types of fracture-dislocations [10, 11]. But in case of femoral head fractures, use of anterior approach is more popular among recent authors to reduce the risk of femoral head vascular problems [12]. Posterior acetabular wall or column fractures should be fixated by a posterior approach and if present, femoral head fractures can be managed through safe dislocation after trochanterotomy [13]. A posterior approach was enough to manage the problems in our case and we didn’t need any trochanteric osteotomy in our case.

The reported cases of recurrent dislocation after hip trauma mostly consist of simple dislocations not associated with fractures. The documented treatment modalities generally involve soft tissue repairs (labral or capsular repair) [14]. In cases of acetabular wall deficiency; the only literature about allograft bone block reconstruction is by Hershey A et al. and in his report the graft was osteochondral and the follow-up time was very short [15].

In our case the graft was only bone block in nature (no any chondral part) and the follow-up time was enough to eradicate osteonecrosis of the femoral head. The patient’s range of motion was very good and he had no complaint about his hip at the 22nd month follow-up.

CONCLUSION

This technique should be kept in mind in rare cases in which the acetabular defect causing instability of the hip is not correctible with routine ways.

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Author Contributions

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Conflict of Interest

Authors declare no conflict of interest.

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