Neglected Hip Fracture-Dislocation in 21 Years-Old Young Male

A Case Series

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ABSTRACT

Introduction

Neglected fracture-dislocation of the hip is common in developing countries due to various factors. However the incidence percentage has not been determined yet. This condition causes several complications of the bone and soft tissue and has poor functional outcome. Different options including arthrodesis, Girdlestone arthroplasty and total hip replacement (THR) are used for its treatment. Till date, arthrodesis in youngsters and resection arthroplasty in the elders has been the treatment of choice. THR, however, is being done by a few, but the experience has not been published. Proper treatment was mandatory to prevent complications.

Methods

We are reporting two cases; of 21 years old man with neglected posterior fracture dislocation of the hip with acetabulum fracture and subtrochanteric fracture of femur. The leg discrepancy was 8 cm and there’s already contracture. The second patient was 21 years old male with neglected
dislocation of right hip, with 6 cm leg discrepancy, and there’s atrophy of quadriceps muscle.

**Result**

For the first patient, we performed soft tissue release, hip arthrodesis, and plating of the femur. The patient planned for THR in the next surgery. Recently, patient walked with 2 crutches. For the second patient, we performed open reduction and arthrodesis.

**Conclusion**

Different options are present for treating old unreduced acetabulum fracture-dislocations. Traction and soft tissue release is essential in management of neglected hip dislocation that present for more than 1 year and heavy skeletal traction should be considered. Total hip replacement with reconstruction of the acetabulum has good functional results.

Keywords: Neglected hip dislocation, Soft tissue release, Hip arthrodesis, Plating.

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INTRODUCTION

Neglected traumatic posterior fracture-dislocation of the hip in young people who present with delayed treatment beyond 3 months has a poor prognosis and outcome. It has several complications which involved soft tissue (i.e.: contractures of muscles, ligaments, and joint capsules) and hard tissue (i.e. delayed/non-union, malunion, osteoporosis, AVN of femoral head, and chondrolysis). We are reporting a case of 21 years old man with neglected posterior fracture dislocation of the hip with acetabulum fracture and subtrochanteric fracture of femur. In clinical examination, the leg discrepancy was 8 cm and there’s already contracture.

CASE REPORT

CASE 1

A healthy 21 year-old man reported painful motion of his right hip and femur for 3.5 years. He had been involved in motor vehicle accident 3.5 years earlier and went to local district hospital in Sumba and advised for amputation but the patient refused and then he attended local bone setter. He only consumed traditional medicine. Three years later he came to outpatient clinic and planned for staged surgery.

A physical examination of the right hip showed that there’s external rotation, shortening with 8 centimeters leg discrepancy, atrophy of quadricep muscle and also false movement of right proximal femur.
Roentgenographic images and computed tomography scans revealed fracture of proximal third of femur and posterior dislocation of right hip (Figs. 1, 2)
**Fig 1. A-D.** A. clinical picture showing the leg discrepancy, the left lower limb was 8 cm shorter than the left. B-C. Initial radiograph of pelvis taken 3.5 after the accident. There’s posterior dislocation of right hip with damage of the femoral head and acetabulum. D. radiograph of right femur taken 3.5 after skeletal traction. There’s athropic non union of proximal shaft of the femur.
Patient was admitted for 8 kgs skeletal traction for 23 days. After 23 days, the leg discrepancy was 6cm. Patient underwent soft tissue release surgery of right hip, hip arthrodesis, soft tissue release of right femur and plating of the femur. The surgery performed with lateral approach in supine position. The fragment of the proximal femoral shaft and acetabulum were exposed and there’s minimal callus. The acetabulum and femoral head was damaged and filled with fibrous tissue. There’s also chondrolysis of the hip joint. Refreshment of bone fragments was performed,
the fragment was reduced and fixed with broad LCP with bone graft (fig 3). The hip joint was fixed with 2 parallel Kirschner wires. The roentgenograph after surgery was taken (fig 4)

Fig 3. A. intraoperative picture showing the damage of acetabulum and femoral head which is filled with fibrous tissue and B. showing the head of femur after soft tissue release and proximal shaft of femur. C. Picture showing the femoral head and acetabulum after reduction and D. Plating of the femoral shaft after the fragment refreshed.
A

B

**Fig 4A-B.** Postoperative roentgenograph after the second surgery. The hip joint was fixed with 2 parallel Kirscner wires (A) and the femur was fixed with broad LCP and bone graft (B). On one month follow up after surgery, the K-wires were removed, patient complained minor hip pain and Non weight bearing with 2 crutches.
CASE 2

A healthy 21 year-old man reported painful motion of his right hip and femur for 2 years. He had been involved in motor vehicle accident 2 years earlier and went to local bone setter. Three years later he came to outpatient clinic and planned for staged surgery.

A physical examination of the right hip showed that there’s shortening with 6 centimeters leg discrepancy, atrophy of quadriceps muscle.

Rontgenographic images and computed tomography scans revealed posterior dislocation of right hip (Figs. 5A-D)

Fig 5A. Clinical picture showing leg discrepancy and skeletal traction

Fig 5B. Initial X-Ray of the hip before skeletal traction
Patient was admitted for 12 kgs skeletal traction. After traction the leg discrepancy was 2 cm. Patient underwent soft tissue release surgery of right hip and hip arthrodesis. The surgery performed with lateral approach in supine position. The acetabulum and femoral head was damaged and filled with fibrous tissue.

6A. clinical picture showing post-operative after arthrodesis of hip.
6B. Pelvic AP view of the hip, showing pin placement in the hip joint.

**DISCUSSION**

Dislocation of the hip and ipsilateral fracture of femur is associated with a poor outcome.\(^1\)-\(^5\) This may be a consequence of the greater energy transmission through the hip, which has implication for the degree of chondral damage suffered. This chondral damage may be responsible for subsequent rapid chondrolysis and early osteoarthritis.

The distortion of local anatomy, especially the proximity of sciatic nerve, caused by the persistent posterior dislocation of the femoral head has been well described by Yue et al. \(^6\) This deformation contributes to the difficulty of intraoperative repair. The extent of operative dissection required to facilitate open hip reduction may also have detrimental effect on the blood supply to the femoral head and may thus contribute to the high incidence of AVN.\(^7\)

Unreduced fracture-dislocation of the hip for more than 3 months is considered an old neglected dislocation. Conservative treatment becomes impossible to achieve stable concentric reduction\(^8\) due to unreduced wall fracture leading to instability and fibrous tissue filling the spaces and
covering the fracture. The operative treatment remains the only chance to reduce the hip or reconstruct with arthroplasty. Various investigators use different methods for operative treatment of old unreduced fracture-dislocations including\textsuperscript{8,32}:

**Girdlestone procedure**: The procedure exposes the head section of the femur bone and then the head is removed. Rarely both sides are done in one operation, most times one side is done and allowed to heal before the other side is done. Unlike most other hip surgeries, the head of the femur is not replaced, but is allowed to heal and develop its own fibrous scar tissue so that the joint is no longer bone-to-bone, a pseudoarthrosis. The neck of the femur is usually removed at the same time as the head. This prevents the post operative complication of bone rubbing on bone and continued pain.

**Arthrodesis.**

- **Cobra Head Plate Technique**

  The technique involves stripping the abductor muscles from the iliac crest to accommodate the cobra head of the plate together with a pelvic osteotomy to enlarge the area of contact between femur and pelvis. Fusion rates from 94\% to 100\% have been reported.

- **Anterior Plating Technique**

  The original motivation for the anterior approach was to create a technique that provides fixation to both the pelvis and femur while sparing the hip abductor muscles. In addition, with the patient supine and the pelvis level during the surgery, positioning of the hip is facilitated. With the screws inserted in an anteroposterior direction, excellent purchase is achieved in this area of thick bone, making this technique advantageous when there is loss of acetabular or proximal femoral bone stock. The insertion of a lag screw from the trochanteric area through the supra-acetabular bone into the center of the femoral head provides additional
compression because of a lateral tension band effect. As with other internal fixation techniques, no external fixation (casting) is required unless the patient is expected to be noncompliant. The anterior plating technique can also be effective in the presence of loss of bone stock.

The patient is placed in the supine position on a standard fracture table or, optimally, on a Judet table. On a Judet table, the hip is placed in the desired position before preparing the patient. An intraoperative radiograph verifies the range of abduction-adduction. The modified Smith-Petersen approach involves elevating the abdominal muscles from the iliac crest through their fascial attachment without violating the abductor musculature. The distal extension is within the tensor fascia muscular sheet, with detachment of both the sartorius and rectus femoris muscles. To expose the femur, the vastus lateralis is elevated from a lateral to medial direction to avoid denervation. With the hip joint exposed and denuded of cartilage, the lag screw is inserted first, followed by the 12- to 14-hole low-contact broad dynamic compression plate. Viewed anteriorly, the plate has a 10° concave bend to match the internal iliac fossa, a 50° convex bend crossing the anterior acetabular rim, and a 35° concavity in the intertrochanteric area. Usually the plate is fixed to the pelvis first, followed by a tensioning device applied to the distal end of the plate. The plate may have to be undercontoured to avoid increasing hip flexion as the plate is being tensioned. Iliac crest bone graft from the inner table may be used if necessary. Postoperatively, patients are usually restricted to 30 pounds of weight-bearing for 8 to 10 weeks. After 12 weeks, if radiographic consolidation is present, full weight-bearing is allowed.
Double Plating technique

The first stage is the preparation of the head and the acetabulum for fusion, usually with local fixation and an intertrochanteric osteotomy to remove the lever arm acting on the desired site of fusion. In the second stage, 6 to 8 weeks later, the intertrochanteric area is stabilized. By removing the lever arm of the femur, the fusion site may heal with greater predictability. With the patient in the lateral position, a modified lateral approach is used; the gluteus medius and minimus muscles are elevated with a part of the greater trochanter. The exposure is continued anteriorly in the plane between the sartorius and tensor, with the hip flexed and externally rotated. The lateral plate (broad 4.5 mm) is first applied and contoured over the trochanteric bed and placed anterior to the greater sciatic notch and along the lateral aspect of the femur. The plate is then secured proximally with a tension device applied distally. After removal of the anterior-inferior iliac spine, the anterior plate (narrow 4.5 mm) is applied along the femoral shaft, and a second tensioning device is applied with the plate fixed proximally. Both
tensioning devices are then tightened; the plates tend to lift off the bone but are reapproximated with the insertion of screws. Postoperatively, patients are limited to 30 pounds of weight-bearing for 8 to 12 weeks and allowed full weight-bearing when consolidation is evident on radiographs.

**Fig 6. Double Plating Technique for Hip arthrodesis**

The advantages of this technique in this case are diminished pain and patient can mobilize early and later this procedure can be converted to hip arthroplasty. The disadvantages are the ROM is diminished and can cause discomfort for the patient.

**Endoprosthctic replacement and total hip replacement.** This technique consists of total hip replacement with acetabular reconstruction (acetabuloplasty) and re-alignment of femoral component by using subtrochanteric osteotomy.

The advantages of this procedure are diminished pain, early ROM mobilization so the patient can perform daily life activity comfortly. The disadvantages are difficulty in adjusting the proper acetabular and femoral component due to pathological conditions of acetabulum and femur also the already damaged soft tissue surrounding the joint making the implant less stable unless using
the more advanced prosthesis.

All these procedures have their merits and demerits and give different outcomes. The result can be further altered by avascular necrosis of the femoral head which occurs in more than 50% of the cases. Garrett et al.\(^8\) and Zippel et al.\(^9\) have recommended total hip arthroplasty for hips with posterior dislocations categorised as type IV (fracture of the acetabular rim and floor) or type V (fracture of the femoral head with or without other fractures) that have remained dislocated for more than 3 months. Malkin et al.,\(^10\) Ilyas et al.\(^11\) and others have shown good functional outcome with THR for old unreduced fracture-dislocation of the hip. Similar to our case with posterosuperior acetabulum wall deficiency due to old unreduced dislocation, the investigators recommend acetabulum reconstruction prior to acetabulum cup fixation. They used either bone graft augmentation for the deficient wall or a cage for stability. Hansen E and colleagues used cemented cage with allograft for reconstruction of acetabular defect, and they found favourable results in total hip arthroplasty.\(^12\)

In our case, patients has already presented 3.5 years and the other one 2 years after injury which makes the reduction difficult due to soft tissue tightening. We decided to perform soft tissue release of the hip and femur on the first patient soft tissue release and hip arthrodesis on the second patient to facilitate the reduction and later range of motion exercise. Later, the patient planned for arthroplasty of the hip. Many recommendations exist for the postreduction treatment of simple hip dislocations.\(^15\-18,19\-22\) In this case we choose THA, because compared to arthrodesis it has several advantages;

- The patient is active young age, so after the THA procedure the patient can get back to daily living activity which.
- There’s subtrochanteric fracture which can cause difficulty if only the arthrodesis is
performed because the end of subtrochanteric fragment has been refreshed so the rotation difficult to be achieved properly if only the arthrodesis performed

- In general, THA gives good functional outcome according to Harris hip score in many studies.

Strict immobilization leads to intraarticular adhesions and arthritis and should be avoided. Most surgeons recommend a temporary period of traction or balanced suspension until the patient’s initial pain has subsided. This rarely takes longer than several days. After this, controlled passive range-of-motion exercises with a continuous-passive-motion machine and early mobilization are thought to benefit the patient’s overall condition. Extremes of motion should be avoided for 4 to 6 weeks to allow capsular and softtissuehealing. 24-26

The most controversial point regarding aftercare is the length of time that weight bearing should be prohibited. Time from several days to 1 year have been proposed. The theoretical advantages of a prolonged non-weight-bearing period apply to patients who have had an ischemic insult severe enough to lead to late collapse. Although early weight bearing has not been shown to add to the initial ischemic insult, it is believed that the amount of collapse in patients who develop AVN may be diminished if weight bearing is delayed. 13 This hypothesis has not been tested prospectively, but does have merit on historical grounds. 14

A delay in full weight bearing for 8 to 12 weeks for patients who are at high risk of collapse may be reasonable. This applies when reduction of the hip was delayed for more than 6 hours. Patients who show radiologic signs (on plain radiography or MR imaging) of AVN early in their followup course may also be treated with protected weight bearing and passive ROM exercises. 26,27 For other patients, partial weight bearing can begin when comfortable and be advanced as tolerated, with full weight bearing usually becoming possible after 2 to 4 weeks.
The ability of the patient to control the leg in space is a good indicator that he is ready to progress to full weight bearing. Rehabilitation should include specific strengthening exercises for the musculature about the hip.\textsuperscript{28-31}

Consequently, primary arthroplasty has been recommended by a number of authors. However, it appears reasonable to suggest, that open repair followed by a short period of skeletal traction should be considered as an alternative treatment for young adults, given the tenuous efficacy of total hip replacement, as determined by long-term results, and their poor tolerance of hip arthrodesis or traction alone.

**CONCLUSION**

Different options are present for treating old unreduced acetabulum fracture-dislocations. Traction and soft tissue release is essential in management of neglected hip dislocation that present for more than 1 year and heavy skeletal traction should be considered. Total hip replacement with reconstruction of the acetabulum has good functional results.

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