

Acetabular Fracture after Hip Hemiarthroplasty: One Stage Procedure to a Total Hip Arthroplasty after Stabilization of the Fracture by Means of Cerclage Wires

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Learning Points for this Article:

Acetabular fractures after hemiarthroplasty can be treated by conversion to a total hip arthroplasty after stabilization of the fracture by means of cerclage wires.

Abstract

Introduction: Hip fractures in the elderly pose an increasing problem in society. In the elderly, a bipolar hemiarthroplasty (HA) remains the treatment of choice in case of hip fractures related to osteoporosis. However, due to an ongoing osteoporosis in this age group, a periprosthetic femoral fracture and a fracture of the unresurfaced acetabulum are increasingly noticed.

In the literature, no information can be found regarding the treatment options for this kind of periprosthetic acetabular fracture.

Case Report: We present a case report of a patient suffering an acetabular fracture 6 years after a HA. A one stage surgical procedure was the treatment of choice, consisting of a stabilization the acetabulum fracture by means of cerclage wires and a conversion of the HA to a total hip arthroplasty (THA). 4 months after surgery, she regained her pre-operative functional status, and a radiographic evaluation of the right hemipelvis showed good signs of the fracture healing without migration of the acetabular component.

Conclusion: This case shows a “one stage” surgery solution for an acetabular fracture after HA. Stabilization of the acetabulum fracture by means of cerclage wires and a conversion of the HA to a THA is a viable solution for this rare and challenging problem.

Keywords: Hemiarthroplasty, acetabular fracture, cerclage wires.

Introduction

Hip fractures in the elderly pose an increasing problem in society. This increase can be attributed to a greater longevity of the population, associated with a high prevalence of osteoporosis and concomitant morbidities.

In the elderly, a bipolar hemiarthroplasty (HA) remains the treatment of choice in case of hip fractures related to osteoporosis [1]. However, due to an ongoing osteoporosis in this age group, a periprosthetic femoral fracture [2] and a fracture of the unresurfaced acetabulum [3] are increasingly noticed. This latter complication is a rather rare but a devastating complication after a hip HA.

In the literature, no information can be found regarding the treatment options for this kind of periprosthetic acetabular fracture. We present a case report of a patient suffering an acetabular fracture 6 years after a HA. A one stage surgical procedure was the treatment of choice, consisting of a stabilization the acetabulum fracture by means of cerclage wires and a conversion of the HA to a total hip arthroplasty (THA).

Case Report

A 90-year-old female was transferred to the hospital after sustaining a low-energy trauma, a simple fall. She experienced

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Figure 1 a: Displaced acetabular fracture with a central dislocation of the bipolar head. The greater trochanter is also fractured.



Figure 1 b: Coronal computed tomography image of the displaced acetabular fracture with a central dislocation of the bipolar head.

pain in the right hip and pelvis. Weight-bearing on the affected side was no longer possible. The medical file revealed a HA for a displaced femoral neck fracture at the right and left side, respectively, 6 and 8 years ago. She was ambulating only short distances using a walking stick. Radiographic assessment revealed a displaced acetabular fracture with a central dislocation of the bipolar head. Impaction against the acetabular roof resulted in a displaced fracture of the greater trochanter (Fig. 1a and b).

No other bony lesions or associated neurovascular injuries were noted. After a careful pre-operative assessment, the surgical plan consisted of a stabilization of the acetabulum fracture by means of cerclage wires together with a conversion of the HA to a total hip prosthesis.

The patient was positioned in a lateral decubitus. A triradiate approach was preferred to gain a wide exposure to the hip joint. The greater trochanter was already fractured. Hence, no osteotomy at that level needed to be done. After removal of the bipolar head, the femoral component seemed to be fixed very

well and was left in place. First of all, a 2 mm braided cable (Zimmer, Inc., Warsaw, Indiana) passed around the body of the ischial bone using Satinsky aortic clamps. Thereafter, one end of the wire carefully passed along the inner pelvic surface while the other passed under beneath the sacrospinal ligament. Both ends were clamped together above the acetabulum, creating a configuration (Fig. 2a) as described by Mears and Shirahama [4]. A second cerclage wire was used to fix the posterior column (Fig. 2b). After reduction and stabilization of the acetabular fracture, the acetabulum was progressively reamed to the appropriate size. A cementless trabecular metal cup (Zimmer, Inc., Warsaw, Indiana) was inserted, and titanium screws were applied to provide additional stability to the construct. A highly cross linked polyethylene liner was implanted together with a new metallic femoral head. The fracture of the greater trochanter was reduced and fixed by means of two AO screws. Finally, a reduction of the total hip prosthesis was performed which seemed to be stable without major leg length discrepancy.



Figure 2 a: Radiographic evaluation of the right hemipelvis 4 months after surgery. Cerclage wiring with Fig.-8 configuration. Good signs of fracture healing without migration of the acetabular component.

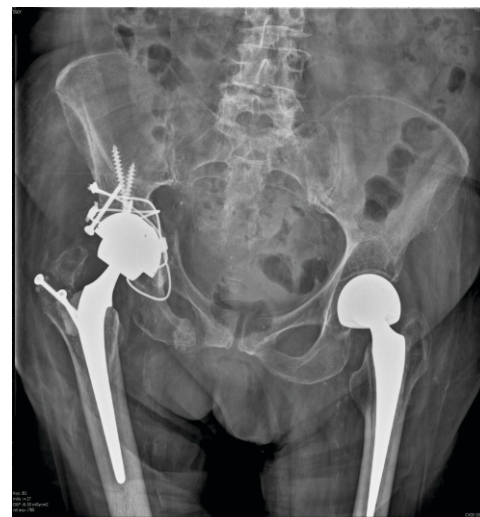


Figure 2 b: Radiographic evaluation of the right hemipelvis 4 months after surgery. Good signs of fracture healing without migration of the acetabular component.

Postoperatively, continuous passive motion of the operated hip was started immediately. Weight-bearing was not allowed during the first 6 weeks. Thereafter, ambulating using a walking device and partial weight bearing (20 kg) was allowed. 4 months after surgery, she regained her pre-operative functional status, and a radiographic evaluation of the right hemipelvis showed good signs of the fracture healing without migration of the acetabular component (Fig. 2a and b).

Discussion

When dealing with an aging population, the prevalence and burden of all osteopenic fractures continue to be of great concern. The incidence of femoral fractures seems to stabilize and even to decrease. On the other hand, the incidence of acetabular fractures shows a 2.4-fold increase over the past quarter of a century. This increasing incidence can be attributed to geriatric patients with osteoporotic bone which are the fastest-growing subgroup of patients with acetabular fractures [3, 5, 6].

Arthroplasty is a well-accepted treatment for patients with displaced femoral neck fractures, showing a decreased patient risk of operation compared with internal fixation at mid-and long-term follow-ups [7]. Regarding the type of implant, current evidence supports a thermoplastic as the treatment of choice for the low-demand elderly patient [8, 9]. Since these patients are at high risk of subsequent fractures, it is not unlikely they sustain an ipsilateral acetabular fragility fracture, resulting from a low-energy trauma such as a fall from a standing height [3, 10].

Few reports have been published discussing the treatment of traumatic periprosthetic acetabular fractures after THA. Several treatment options were described including conservative treatment and acute or delayed revision arthroplasty [11, 12]. To our knowledge, no literature exists

regarding the treatment of an acute acetabular fracture after HA of the ipsilateral hip. In this case report, we preferred an acute one stage procedure: Conversion to a THA with open reduction and stabilization of the acetabular fracture with two cerclage wires. Several techniques of fracture reduction and stabilization (cables, formal, open reduction and internal fixation [ORIF], or percutaneous ORIF) can be used but the goal of the treatment remains the reduction both columns in such a way that a fracture stability can be achieved for the acetabular component, which is imperative to minimize the risk of aseptic cup loosening [13]. In our case, the cerclage technique as described by Mears and Shirahama was used [4]. Good functional and radiographical results have been reported with this technique when treating acetabular fractures with acute THA [4, 14].

The advantage of a one stage surgical procedure is obvious: Reduction of the post-operative time of bed rest and full weight bearing which can be allowed rapidly. In this way, associated complications such as decubitus and venous thrombosis can be reduced.

Conclusion

This case shows a “one stage” surgery solution for an acetabular fracture after HA. Our short-term follow-up showed an adequate fixation of the acetabular component, an adequate healing of the acetabular fracture which allows a rapid mobilization of the patient. Therefore, we believe this is a viable solution for this rare and challenging problem. A longer follow-up and more cases are necessary to confirm these findings.

Clinical Message

A periprosthetic fracture of the unresurfaced acetabulum after a HA is a rare but severe complication. Acute stabilization of the acetabulum fracture by means of cerclage wires and a conversion of the HA to a THA is a viable solution for this challenging problem.

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