



Case Report

Sequential complex bilateral total hip arthroplasty in neglected acetabular fractures – A case report



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المخلص

تتعدد العديد من حالات كسور الخُق بسبب الإهمال، مما يؤدي إلى مزيد من الضرر لرأس عظم الفخذ بما في ذلك الفصال العظمي بعد الصدمة والتصلب. تؤدي هذه الأحداث الضائرة في النهاية إلى تعقيدات في معالجة هؤلاء المرضى. ويعتبر رأب مفصل الورك الكلي خياراً جراحياً لتحسين ثبات المفصل ووظيفته، بالإضافة إلى التحكم في الألم. أبلغنا عن ذكر يبلغ من العمر ٧٠ عاماً مصاباً بكسر خفي ثنائي مهمل، قدم إلينا مع الفصال العظمي بعد الصدمة والتصلب والنتوء. على الرغم من الفارق الكبير بين طول الطرفين السفليين مع تشوه الورك الأيسر، فقد خضع المريض لرأب مفصل الورك الكلي الأيمن وتعافى بثبات ملحوظ. وبعد عام واحد، خضع المريض بنجاح لرأب مفصل الورك الكلي الآخر. الآن بعد مرور عام على العلاج الجراحي، أصبح المريض بدون ألم مع قدرة ملحوظة على الحركة. عند علاج مريض مصاب بكسر خفي مهمل وفصال عظمي بعد الصدمة ثنائي فإن رأب مفصل الورك الكلي الثنائي هو خيار علاجي قابل للتطبيق مع نتائج مواتية للمريض.

الكلمات المفتاحية: تتابع عمل الجهتين المعقد؛ رأب مفصل الورك الكلي؛ كسر خفي؛ الفصال العظمي بعد الصدمة؛ رأس عظم الفخذ

Abstract

Severe cases of acetabular fractures are complicated, leading to further damage to the femoral head and post-traumatic osteoarthritis (PTOA). These adverse events eventually lead to complexities in the management of patients with the aforementioned conditions. Total hip

arthroplasty (THA) is a surgical option for improving both stability and functionality, and for controlling pain in patients with PTOA. Herein, we report the case of a 70-year-old male patient with neglected bilateral acetabular fracture who presented with PTOA and protrusion. Despite significant limb-length discrepancy with the deformity of both hips, the patient underwent a successful right THA and recovered with remarkable stability. One year later, the patient underwent successful left THA. One year following the surgical treatment, the patient is pain free with notable mobility. When treating a patient with a neglected acetabular fracture and bilateral PTOA, bilateral THA is a viable treatment option with favourable patient outcome.

Keywords: Acetabular fracture; Femoral head; Post-traumatic hip arthritis; Sequential complex bilateral; Total hip arthroplasty

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Introduction

Acetabular fractures can pose a treatment challenge in elderly patients. Approximately 57% of acetabular fractures develop posttraumatic arthritis.¹ Sometimes due to patient negligence, intentional or unintentional, further damage to the femoral head ensues, making management more difficult.² For patients with acetabular fractures, total hip arthroplasty (THA) has been shown to increase stability, improve functionality, and decrease pain but also has increased risk of postoperative complications.^{2,3}

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Even in the case of bilateral neglected acetabular fractures with post-traumatic arthritis, bilateral THA may serve as a viable treatment option. The purpose of this case report is to present a difficult case of bilateral THA following neglected acetabular fractures.

Case presentation

A 70-year-old male veteran with a history of bilateral hip pain presented to our clinic after multiple failed corticosteroid hip injections. The patient was a paratrooper and sustained left hip trauma 40 years ago in a parachute landing and a second time after flipping an ATV. Right hip pain began after a fall from a lawn mower onto his right side a year prior to presentation. He had been ambulating with a walker and complained of extreme pain with any bilateral hip range of motion and denied any weakness or paraesthesia. He was found to have a neglected right acetabular fracture with protrusion and advanced post-traumatic osteoarthritis (PTOA), and severe degenerative changes in the left hip with protrusion and evidence of old acetabular fracture (Figure 1). Since his right hip pain was worse, the patient agreed to proceed with right THA.

Surgery was performed 1 month after initial presentation. The patient underwent general anaesthesia and was positioned in the lateral decubitus position. Preoperative imaging was used to estimate femoral and acetabular components. His right lower extremity was prepped, and 2g of cefazolin were administered. A standard posterior approach was utilized per surgeon preference. After exposure was performed, a significant amount of protrusion was encountered, making dislocation of the femoral head difficult. An in situ osteotomy of the femoral neck was performed prior to removal of the femoral head. Retractors were then placed, and the acetabulum was prepared. Sequential reaming was then performed up to size 61. The bone was well preserved. A size 62 Zimmer trabecular metal cup (Zimmer Orthopedics, Warsaw, IN, USA) was then impacted and secured with two 6.5 mm × 25 mm screws in the posterior-superior quadrant. The cup was positioned 45 degrees of abduction and 20–30 degrees of anteversion. No grafting was necessary as the cup was found to be very stable. A neutral polyethylene liner was then inserted.



Figure 1: Preoperative anteroposterior radiograph of pelvis.



Figure 2: Bilateral anteroposterior radiograph of hip after right total hip arthroplasty.

Attention was then turned to preparation of the femoral canal. An opening reamer was inserted, followed by a box cutter. Sequential broaching was performed, and a size 4 Zimmer Avenir stem was inserted using the press-fit technique, and an appropriate head was placed. The hip was reduced with excellent stability, though the patient did have a significant leg length discrepancy due to the residual deformity of the non-operative hip. By 6 months post-operative, the patient had painless range of motion in his right hip, but ambulated with a walker because of the severe pain in his left hip (Figure 2). He elected to proceed with left THA.

Six months later the patient underwent left THA. Using a standard posterior approach, the hip was dislocated revealing extensive bone loss of his femoral head and acetabulum. A femoral neck osteotomy was made approximately 1 cm superior to the lesser trochanter. Sequential acetabular reaming was then performed up to size 59. The bone was well preserved. A size 60 Pinnacle Gription cup (DePuy Synthes, Raynham, MA, USA) was then impacted and a Pinnacle Altrx polyethylene acetabular liner (DePuy



Figure 3: Anteroposterior radiograph of left hip after second total hip arthroplasty.

Synthes) was placed. No grafting was necessary as the cup was found to be very stable. The femoral canal was then prepared using an opening reamer. Sequential broaching was performed, during which the patient sustained a small calcar fracture, which was secured using cable fixation. A size 10 Corail stem (DePuy Synthes) was inserted using the press-fit technique, and a 36-mm plus 5 head was secured to the stem. The hip was reduced and found to have excellent stability. Leg lengths were found to be equal. The patient had an uneventful postoperative course. One year after the left THA and 18 months after the right THA, and following appropriate rehabilitation and conditioning, the patient is pain free and ambulating without assistance (Figure 3).

Discussion

Acetabular fractures, although accounting for only 3% of all traumatic fractures,³ call for extensive discussion because of the numerous factors that complicate outcomes. Open reduction internal fixation is commonly advocated for most acetabular fractures to preserve the joint, restore acetabular bone block, minimize pelvic deformity, and reduce the chances of PTOA.^{1,4} Despite advanced surgical management, PTOA ensues in 20%–30% of acetabular fractures, and can be attributed to the severity of the initial injury.⁴ Therefore, some surgeons recommend acute THA for acetabular fractures due to a high risk of failing open reduction internal fixation.⁵

Radiographically discernible PTOA is seen in as many as 57% of patients with acetabular fractures.¹ Avascular necrosis is seen in as many as 5.6% of these patients.⁶ THA is performed for complication management in 8%–23% of acetabular fractures.⁶ However, THA after acetabular fracture is considered one of the most difficult primary hip reconstructions due to acetabular bone defect.^{4,6} Other recognized risk factors associated with conversion to a THA are age >55 years at fracture, posterior wall/column fractures, femoral head damage, dislocation, and incongruent reductions.⁴

Compared with THA performed for primary osteoarthritis, THA performed for late complications following acetabular fracture has inferior outcomes and high complication rates in both the short and long term, namely infection, dislocation, leg length discrepancy, and heterotopic ossification.⁷ Poor outcomes are attributed to the increased technical challenge due to the loss of surgical landmarks and prior acetabular open reduction internal fixation.⁸ Patients who undergo THA performed for PTOA following acetabular fractures have double the risk of complication, including 2.5 times the likelihood of THA dislocation and 3.5 times the likelihood of developing heterotopic ossification, when compared with patients who undergo THA for other indications.⁶ Despite complication rates as high as 41%, THA is recommended for PTOA because of significant improvement in pain and function at 10 years' follow-up.⁶

Conclusion

Acetabular fractures are challenging to treat as they give way to long-term complications. Both neglect and delay in

treatment lead to various complications such as femoral head damage and/or avascular necrosis. Neglected acetabular fracture with post-traumatic hip arthritis can still have a good outcome when treated with total hip arthroplasty.

Recommendation

When treating a patient with neglected acetabular fracture and bilateral post-traumatic hip arthritis, bilateral THA is a viable treatment option with good patient outcome.

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Conflict of interest

The authors have no conflict of interest to declare.

Ethical approval

The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services (IRB-300000976) dated 22nd December 2020.

Authors' contributions

AJ served as lead author and was involved in all aspects of the manuscript preparation. RJ, MS, and BA contributed significantly to the manuscript preparation. AS assisted in manuscript editing and provided logistic support. SN served as senior contributing author and operating surgeon, and assisted in manuscript editing. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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