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Case Report

Acetabular fractures in the elderly population: internal fixation combined with acute total hip arthroplasty

Goncalo Modesto*, Catarina Corte-Real, João Boavida, António P. Lopes

Department of Orthopedic Surgery, Centro Hospitalar e Universitário de Coimbra, ULS Coimbra, Portugal

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***Correspondence:**
Dr. Goncalo Modesto,
E-mail: goncalo.modesto@gmail.com

ABSTRACT

The incidence of acetabular fractures in the elderly population is increasing, primarily due to pre-existing osteoporosis and low-energy trauma. Nevertheless, the optimal treatment algorithm remains a subject of debate. This case report details the treatment of a 77-year-old male patient with an acetabular fracture involving both columns and dome, treated with open reduction and internal fixation plus concomitant total hip arthroplasty.

Keywords: Acetabular fracture, Elderly, Fracture hip, Open reduction internal fixation, Total hip arthroplasty

INTRODUCTION

Arthroplasties of major joints are among the most common and successful orthopaedic procedures, with increasing demand worldwide. This can be attributed to several factors, including the aging population, the growing demand for improved quality of life, the desire to maintain high activity levels, and the expansion of indications for joint replacement surgery to even younger populations.

Consequently, there has been a concomitant rise in acetabular fractures among patients over 60 years of age. The predominant mechanism of injury in this demographic is low-height falls (47%), followed by motor vehicle accidents (29%).[1]

The fracture pattern in elderly patients has been reported to largely involve the anterior column (50–60%) and is often associated with significant marginal impaction of the weight-bearing dome, in addition to medialization of the hip joint, because the quadrilateral plate is usually fractured.[2]

The three most common treatment modalities are nonoperative treatment, open reduction and internal fixation (ORIF), and total hip arthroplasty (THA) delayed or acute, with or without combined ORIF.

In the elderly population, achieving anatomical reduction is more challenging, resulting in a higher incidence of complications and conversion to THA.

Conversely, primary THA has emerged as a treatment of choice for specific patient populations. This group includes individuals with pre-existing osteoarthritis (OA), osteoporosis, fracture comminution, posterior wall involvement, articular impaction, femoral head chondral injury, or ipsilateral head and neck fracture.[2]

The optimal treatment of elderly patients with acetabular fracture remains controversial.

CASE REPORT

A 77-year-old male patient was admitted to the emergency department following a hit-and-run incident while cycling. The patient exhibited severe pain in the right hip, accompanied by restricted active and passive hip movements. Initial plain radiographs revealed an acetabular fracture involving both columns, accompanied by mild signs of pre-existing OA. A subsequent computed tomography (CT) scan was performed to assess the fracture pattern, revealing a comminuted fracture of the right acetabulum. This fracture involved the acetabular dome, anterior and posterior pillars, and walls, extending

to the wing of the ipsilateral iliac. Additionally, a fracture of the ischiopubic branch was identified in two separate locations, and a fracture of the base of the iliopubic branch was also noted (Figure 1).

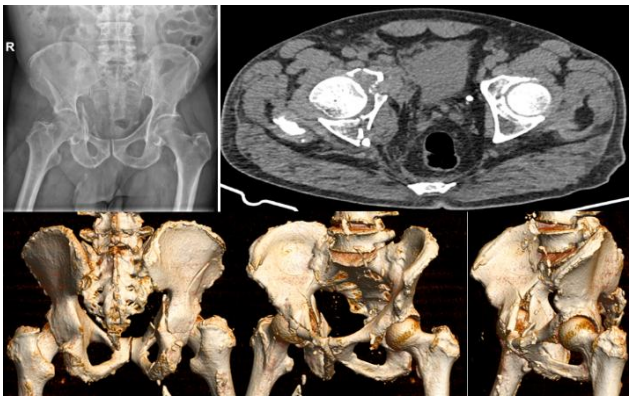

Figure 1: Preoperative radiograph and CT image of the pelvis upon admission to the emergency department, showing a comminuted acetabulum fracture, with mild signs of pre-existing OA.

The patient underwent a medical evaluation by a multidisciplinary team from the anesthesiology and orthopedic departments. The team determined that the patient was a suitable candidate for operative treatment. Skeletal traction was applied until definitive surgery.

The surgical intervention was executed on the tenth day following the initial trauma, employing general anesthesia and a left lateral decubitus position. The surgical approach employed was a combination of the Kocher Langenbeck approach and an iliac lateral window, which was used to facilitate the reduction of the anterior columns and the iliac crest supplemental fixation. Two 3.5 mm contoured plates were applied in the posterior wall and column, with screws directed towards the anterior column. Intraoperative fluoroscopy was employed to ensure precise alignment and stability. The fixation was stable, and hybrid total hip arthroplasty was performed, using a trabecular metal acetabular cup with additional stability provided by two screws and cemented femoral stem (Figure 2).

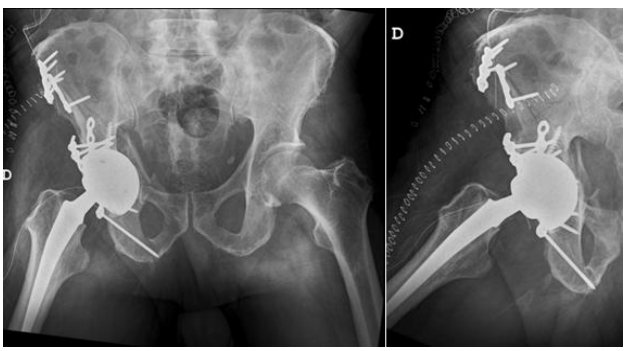

Figure 2: Postoperative radiograph after primary THA, which was performed in conjunction with an ORIF.

Postoperatively, the patient exhibited stable hemoglobin levels and initiated bedside physiotherapy. On the first day following the operation, the patient was mobilized from bed to chair. By the second day, the patient had initiated a physical therapy regimen designed to promote mobilization with crutches and restricted weight bearing. The patient was discharged from the hospital ten days after the procedure, having recovered well. At six months after the surgery, the patient is walking without external support, no limping or pain reported, resuming all daily living activities. Nowadays, at three years postoperative, presented a stable and asymptomatic hip, with a high degree of satisfaction with the outcomes. He presents practically symmetrical mobility, except a flexion deficit of five degrees. It features a Harris hip score of 82. On imaging, the fracture is consolidated, with no signs of loosening of the prosthesis, with slight leg length discrepancy in the right lower limb of 0.5 cm, a slight decrease in the femoral offset and a heterotopic ossification grade 2 of Brooker classification (Figure 3).

Figure 3: Postoperative radiograph at 3-year follow-up.

DISCUSSION

Acetabular fractures have been observed across all age demographics, with a predilection for high- energy trauma. However, in recent decades, there has been a notable increase in the number of elderly patients who have sustained acetabular fractures due to low-energy trauma.[1] Acetabular fractures in the elderly population have been shown to have a significant impact on mobility and longevity, underscoring the need for increased attention from healthcare professionals.

The decision to pursue operative treatment for these fractures is often influenced by factors such as age, comorbidities, and the presence of osteoporosis, which can dissuade surgeons from recommending surgery, even in cases where it would be considered a viable option for younger patients.[3]

Despite the rising incidence of acetabular fractures in the elderly population, the optimal management of these fractures remains to be elucidated. The efficacy of ORIF for acetabular fractures in elderly patients is suboptimal,

particularly in cases of osteoporotic fractures, which can compromise the quality of articular reduction.[4]

Immobilization for prolonged weight-bearing restrictions following ORIF carries significant risks. Moreover, comparative analyses of acute and delayed THA reveal an elevated revision rate in the delayed THA group, suggesting that primary THA may facilitate a higher rate of ambulatory patients at discharge.[2,5]

The authors opted for osteosynthesis via a posterior approach with an iliac window, which allowed at the same time and with the same patient positioning to get the stability of the two columns sufficiently stable to safely use a cementless trabecular metal cup. The use of uncemented press fit acetabular components is usually associated with superior outcomes in both acute and delayed THA.[2]

The hip center of rotation could be better restored with an anterior intra-pelvic approach; however, the surgical aggression would be much higher. The use of a lateralized stem or liner could be options to consider for a more complete biomechanical restitution of the hip.

CONCLUSION

The present case report indicates that, within the specified population, the concomitant application of ORIF and THA in the setting of an acetabular fracture is a valid therapeutic option.

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