

Subchondral Insufficiency Fracture of the Acetabulum: A Case Report

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ABSTRACT

Subchondral insufficiency fractures are a rare cause of hip pain. Unlike acute traumatic fractures, acetabulum insufficiency fractures are less common than femoral fractures. They commonly occur in postmenopausal women with comorbidities. Its initial diagnosis is usually difficult and clinical suspicion is of great importance. Magnetic resonance imaging (MRI) is a fundamental tool for the detection of this pathology. Underestimating these injuries can lead to the development of rapidly progressive osteoarthritis and joint replacement as an outcome. We present the case of a 68-year-old patient with a subchondral insufficiency fracture of the acetabulum who underwent uncemented total hip arthroplasty.

Key words: Insufficiency fracture; acetabulum; total hip arthroplasty.

Level of Evidence: IV

Artrosis rápidamente progresiva de cadera secundaria a una fractura por insuficiencia subcondral del acetábulo. Reporte de un caso

RESUMEN

Las fracturas por insuficiencia subcondral son una causa poco frecuente de cadera dolorosa. A diferencia de las fracturas traumáticas agudas, las fracturas por insuficiencia del acetábulo son menos frecuentes que las femorales. Ocurren habitualmente en mujeres posmenopáusicas con comorbilidades. Su diagnóstico inicial suele ser dificultoso y la sospecha clínica es de gran importancia. La resonancia magnética es una herramienta fundamental para detectar este cuadro. Subestimar estas lesiones puede llevar al desarrollo de una artrosis rápidamente progresiva y al reemplazo articular como desenlace. Se presenta el caso de una paciente de 68 años con una fractura por insuficiencia subcondral del acetábulo a quien se le indicó una artroplastia total de cadera no cementada.

Palabras clave: Fractura por insuficiencia; acetábulo; artroplastia total de cadera.

Nivel de Evidencia: IV

INTRODUCTION

Subchondral insufficiency fractures are a rare cause of hip pain in adults. There are several published reports on subchondral fractures of the femoral head, but little has been described about acetabular insufficiency disease.^{1,2}

It usually occurs in postmenopausal women with comorbidities and usually affects the spine, pelvis, and lower limbs. This fracture pattern usually occurs atraumatically and, although the causes that produce it are not fully defined, various factors have been reported, such as prolonged corticosteroid therapy, kidney disease, obesity, and lumbopelvic balance disorders.³

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This pathology is usually underestimated, because, in the initial stages, the absence of clear radiographic signs makes early diagnosis difficult. Suspicion of this injury is essential and identifying it early can prevent rapidly progressive osteoarthritis, the outcome of which will be joint replacement.⁴

We report the case of a 68-year-old woman with a diagnosis of acetabulum insufficiency fracture without associated trauma.

CLINICAL CASE

A 68-year-old woman consulted at our center for a one-year history of right hip pain, with no traumatic history. Her body mass index (BMI) was 30.9 and she did not report chronic consumption of medication, alcohol or tobacco, or other relevant comorbidities, as well as no previous orthopedic surgeries. Before the onset of symptoms, the patient was self-reliant, with a 6/6 level in activities of daily living. When tested, she had a Katz score of 4/6. The pain—mainly mechanical—had increased in the past three months, forcing her to walk with a cane and use painkillers sporadically. On physical examination of the right hip, the maximum flexion was 145°; the extension, 20°; internal rotation, 40°; external rotation, 50°; abduction, 40° and adduction, 25°. There were no apparent discrepancy or deviations in the mechanical axis of both lower limbs.

On the anteroposterior (AP) and lateral radiographs of both hips, a cervico-diaphyseal angle of 131° was observed, and the acetabular index and Wiberg's lateral center-edge angle were within normal limits in both hips. In the right hip, there were obvious signs of joint wear with joint space narrowing and subchondral sclerosis, classified as Tönnis grade 2. Upon closer inspection, an acetabular articular step-off was detected at the posterior superior level (Figure 1). An MRI was requested. The images revealed a zone of hyperintensity in the weight-bearing area of the acetabulum, which confirmed the injury (Figure 2). The biochemical parameters did not show significant alterations.

Based on these findings, a subchondral insufficiency fracture of the right acetabulum was diagnosed. In the first instance, and after having explained the prognosis and probable evolution, it was decided to perform a CAT-guided infiltration with hyaluronic acid and a depot corticosteroid. The patient was indicated to continue using a cane during 6 weeks to reduce the load on the affected limb. The pain improved slightly after three months, but she still had significant limitations to walk more than 100 meters. Finally, after 4 months from the initial consultation in our center and due to the progression of symptoms, she underwent a cementless right THA (Figure 3). Radiographic controls 3 and 6 months after surgery showed stable implants. The patient had resumed her usual activity without any restriction (Figure 4).

DISCUSSION

Acetabular fractures are generally associated with high-energy trauma.⁵ In contrast, a subchondral insufficiency fracture is caused by normal or physiological stress applied to bone tissue with poor elastic resistance.⁶

Unlike acute traumatic fractures, acetabulum insufficiency fractures are extremely rare compared to femoral fractures.⁷ Various predisposing factors have been published, including chronic use of corticosteroids, osteopenia, alcoholism, and a high body mass index; the latter is the only pathological finding in our patient.^{8,9}

Early diagnosis of these lesions is essential; otherwise, they can trigger rapidly progressive osteoarthritis and increase morbidity and mortality in these patients.^{10,11} Routine radiographs often fail to identify these fractures, osteopenia is the only evident radiographic finding. Angles et al. published a case of an acetabular insufficiency fracture in an 83-year-old patient, whose radiographs did not initially show alterations and, after three weeks of continuing symptoms, the diagnosis of the acetabular lesion was reached by CAT.¹²

Upon consultation for acute coxalgia without a traumatic history and without visible radiographic abnormalities, the possibility of performing an MRI should be considered. This study is characterized by its high sensitivity to detect acetabular and femoral insufficiency fractures, and provides additional information on other diseases. For example, bone edema without a fracture could correspond to transient bone marrow edema. In some cases, these MRI findings could be directly related to the natural evolution of a subchondral insufficiency fracture of the hip.¹³



A



B



C

Figure 1. Preoperative anteroposterior (A), enlarged anteroposterior (B) and lateral (C) radiographs of the right hip. The 2 mm deep focal subchondral collapse is seen in the posterior superior portion of the acetabular roof (arrows).

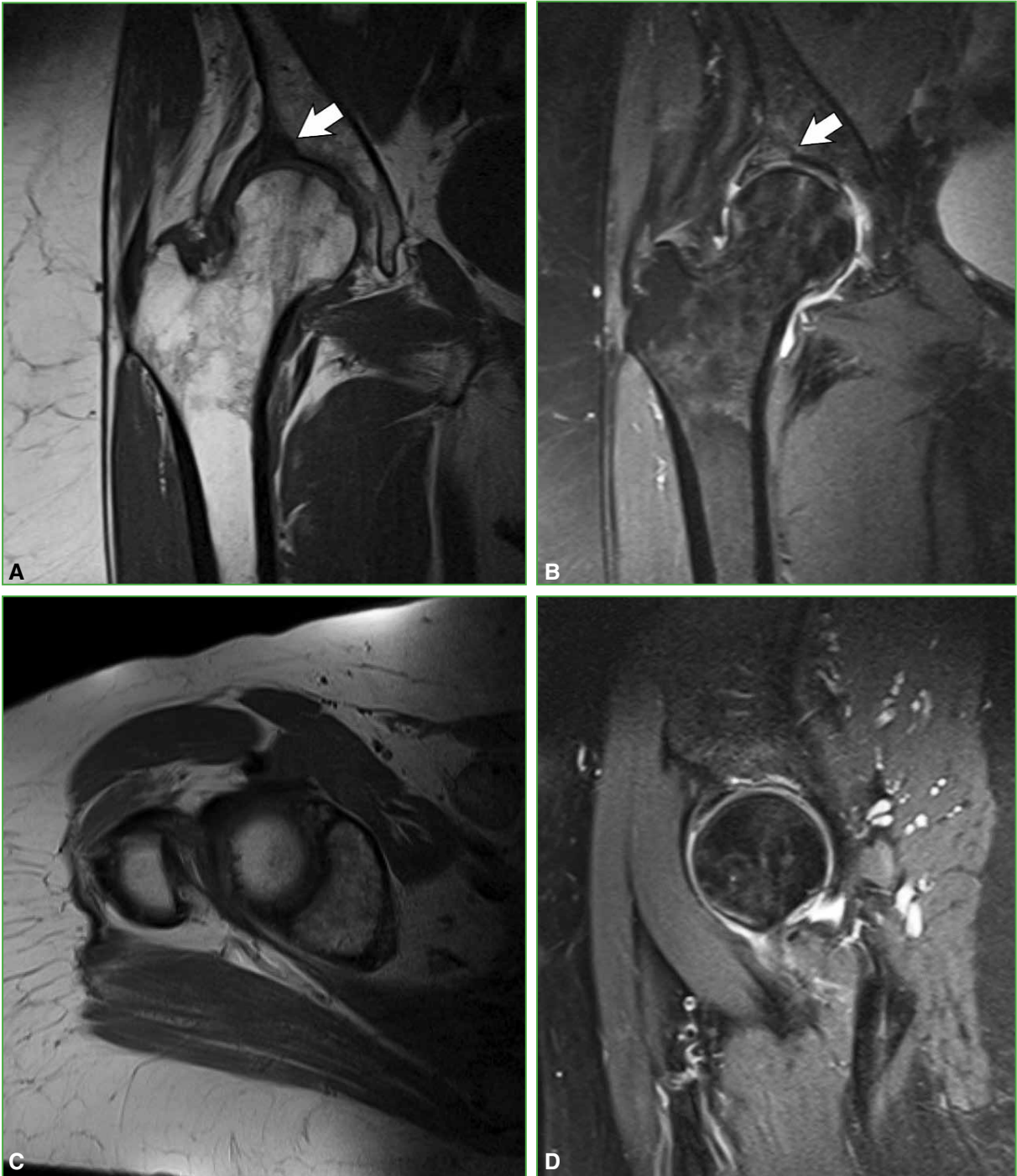


Figure 2. Magnetic resonance imaging, coronal planes (A and B), axial plane (C), sagittal plane (D). Hypointense signal in T1-weighted sequence and hyperintense signal in T2-weighted sequence. Periacetabular edema suggestive of insufficiency fracture.



Figure 3. Immediate postoperative radiograph. The cementless total replacement of the right hip is observed.



Figure 4. Radiograph at 6 months after surgery.

As differential diagnoses, the following conditions should be considered: occult fracture, bone edema, transient osteoporosis, osteochondral lesions, and hip osteonecrosis.¹⁴ After the initial diagnostic MRI, it is necessary to conduct a serial follow-up of these lesions, at least three weeks after diagnosis.¹⁵ We believe that CAT scans should be reserved for those cases in which there is a traumatic history or previous ipsilateral surgery. Guerado et al. described a series of patients over 75 years of age who had been diagnosed with an occult fracture of the acetabulum secondary to intramedullary osteosynthesis to treat a hip fracture.¹⁶

Imaging evaluation of the spine should not be neglected, since lumbar degenerative kyphosis and other spinopelvic balance alterations could be predisposing factors.¹⁷ However, in the reported case, our patient had no alterations in the spinogram.

The known evidence on the treatment of acetabular insufficiency fractures is varied, and therapeutic options depend on the clinical presentation and include conservative and surgical methods.¹⁸ The initial management of an acetabulum or femoral head insufficiency fracture is controversial. If there are no signs of collapse on imaging studies, some authors recommend weight bearing restriction as first-line treatment.¹⁹ After the failure of conservative treatment in the first instance, our patient was indicated for a cementless total hip arthroplasty.

Clinical suspicion is important in a patient with acute coxalgia and associated predisposing factors, whose initial radiographs are normal. MRI continues to be a fundamental tool in the diagnosis of these lesions; it should be requested immediately upon suspicion to avoid joint collapse and rapidly progressive osteoarthritis.²⁰

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