

Case Report

Non-traumatic bilateral comminuted acetabular fracture

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ABSTRACT

High-energy trauma has been confirmed as a cause of bilateral acetabular fracture. However, there are few reports on nontraumatic bilateral acetabular fracture. We report a case of bilateral acetabular fracture that occurred acutely with no preceding trauma in a 50-year-old man with osteoporosis. The case shows the significance of regular annual calcium and vitamin D screening of patients at a high risk of pathological fracture.

Keywords: Acetabular fracture, Bilateral acetabular fracture, Fracture without trauma, Insufficiency fracture, Osteoporosis fracture

INTRODUCTION

High-energy trauma is the most common cause of acetabular fractures in young patients. However, insufficiency fractures caused by osteoporosis are the most common cause of acetabular fractures in the elderly population.¹ Although bilateral acetabular fractures have been reported in the context of high-energy trauma, there are only few cases of atraumatic bilateral acetabular fractures. These are mostly related to seizure activity caused by epilepsy or electroconvulsive therapy.² We present a case of bilateral insufficiency acetabular fractures without any history of trauma in a 50-year-old man. The subject provided written informed consent for publication of his case.

CASE REPORT

A 50-year-old man, a smoker with systemic osteoporosis, presented to the emergency room for pain in both hips and inability to bear weight. He alleged that he woke up and could not move out of bed with pelvic pain on the day of admission and no other complaints. His past medical history includes osteoporosis (T-score, -3.6; Z-score, -2.9),

primary hyperparathyroidism, and subclinical hypothyroidism with goitre. On clinical examination, the patient looked well and cooperative. He was conscious and oriented to person, time, and place. He was vitally stable with intact neurovascular status and tenderness in the pelvic area and restricted range of motion in both hips. We investigated the underlying cause of presentation via serial examinations. Anteroposterior radiography of the pelvis was performed and showed bilateral comminuted displaced acetabular fractures (Figure 1). Computed tomography of the chest, abdomen, and pelvis showed paraseptal emphysematous changes in the bilateral upper lobes, bilateral posterior pleural reactions, bilateral multiple displaced acetabular fractures, and pelvic hematoma (Figure 2). Moreover, computed tomography (CT) with contrast was conducted to rule out pulmonary embolism. Ultrasonography of the thyroid showed an enlarged, heterogeneous thyroid with increased vascularity in the right lobe, suggestive of thyroiditis. In the laboratory test, vitamin D level was 12.47 nmol/l, parathyroid hormone level was 11.56 pmol/l, and thyroid-stimulating hormone level was 15.52 uIU/ml. Non-surgical management was applied through skeletal traction of bilateral lower extremities for one month.



Figure 1: Pelvic radiograph showing bilateral acetabular comminuted fractures.

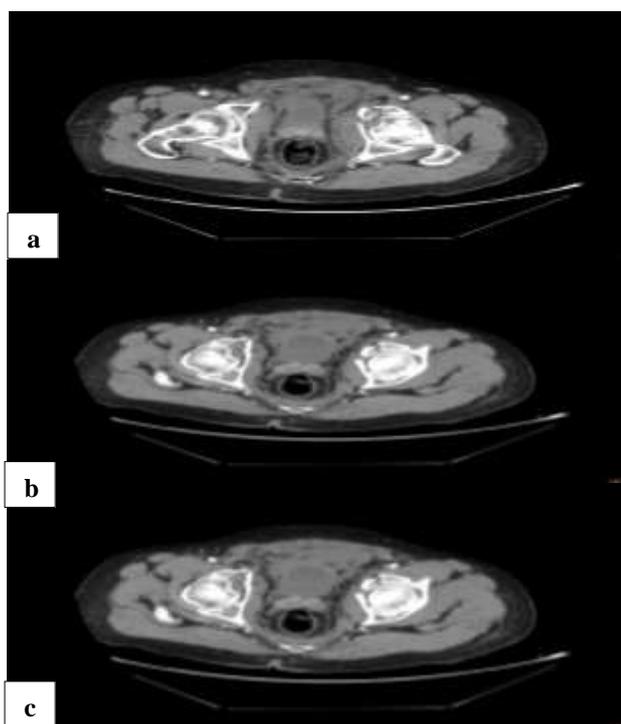


Figure 2: (a), (b) and (c) Axial computed tomography scan of the pelvis confirming the presence of bilateral comminuted acetabular fractures.

DISCUSSION

The majority of acetabular fractures occur due to trauma, with an overall incidence of 3 cases per 100,000 in the local population.³ In comparison to acute traumatic fractures, insufficiency fractures are caused by normal stresses applied to the bone with lower mechanical strength.⁴ They frequently affect the spine, pelvis, and lower extremities, but an osteoporotic vertebral compression fracture is the most common type. Insufficiency fractures in the pelvis most commonly occur in the pubis, ilium, and sacrum. However, acetabular fractures are uncommon.⁵

Many factors contribute to the development of insufficiency fractures, including female sex, osteoporosis,

and degenerative arthritis, inflammatory arthritis, and radiation therapy, reconstructive surgery in the lower limbs, Paget's disease, and regional disuse osteopenia.⁶⁻⁹

It is challenging to diagnose acetabular insufficiency fracture by imaging. These fractures usually cannot be detected by routine radiography. Imminent fractures cannot be detected by CT, although it can show accurate images of fractures. Subtle changes in the bone could be determined by scintigraphy because of its high sensitivity. However, the findings are nonspecific and require correlation with other studies. The most sensitive tool for the detection of occult bone injury was magnetic resonance imaging.^{10,11}

To the best of our knowledge, there are two cases reported in the English literature that showed bilateral acetabular insufficiency fracture without pre-existing trauma.^{12,13} However, none of them have significant findings on radiography. The first case was noted in a 70-year-old man who presented with a sudden onset of bilateral pelvic pain without any trauma and reported to have only systemic osteoporosis as a predisposing risk factor. The initial standard radiographs were reported as negative for fractures.¹² In comparison, our case showed bilateral comminuted displaced acetabular fractures on imaging. In both cases, osteoporosis is considered a significant risk factor of insufficiency fractures.

A 49-year-old woman reported acute atraumatic bilateral acetabular insufficiency fractures.¹³ The patient presented with severe abdominal pain. Her past medical history showed chronic renal disease with advanced stage, liver transplantation (requiring regular oral sirolimus), osteoporosis (T score, 3.1), needed zoledronic acid for management, and asthma. This case was investigated using several methods, including upper abdominal and renal tract ultrasonography and CT of the abdomen and pelvis with contrast; at that time, no fracture was identified in both acetabula. Moreover, because the patient has not improved, exploratory laparotomy was performed. No pathology was found. Postoperatively, she complained of bilateral groin pain, and subsequent CT identified bilateral anterior column posterior hemitransverse fractures of both acetabula, which were not detected on imaging performed before surgery. The patient started with nonoperative management but has not improved, so reduction and internal fixation was indicated. After 1 year, the patient was able to mobilize without aid. Similar to our case, this patient has a history of osteoporosis and had atraumatic bilateral acetabular insufficiency fractures.

Compared to one case of unilateral insufficiency fracture reported by Samuel et al, a 93-year-old man reported insufficiency fracture of the medial wall of acetabulum with no history of trauma.¹⁴ The patient presented with sudden onset of left hip pain. Routine radiography showed osteoporosis with minimal superior joint space narrowing in the patient's left hip, which was believed to be the predisposing factor. The patient received non-steroidal

anti-inflammatory medication and bisphosphonate. After 6 weeks, the patient presented with progressively worsening hip pain and significant difficulty in ambulation. The patient underwent serial examinations and finally diagnosed with an insufficiency fracture of the medial wall of acetabulum and underwent total hip arthroplasty. After 2 years, the patient was pain-free and had no difficulty in ambulation. In the same way, our patient presented with acute onset of pain and inability to bear weight, and both patients had osteoporosis, which plays a major role in such fractures. Conversely, the images of our patient showed comminuted displaced fracture in both acetabula, whereas, in Samuel's case, the fracture was in the left hip only.

CONCLUSION

This is a case of a 50-year-old man with known case of systemic osteoporosis, but the patient is not using any medication and presented with acute hip pain and inability to bear weight. Upon investigation, he was diagnosed with bilateral comminuted displaced acetabular fracture. Skeletal traction was placed in both lower limbs, and bed rest for one month was planned. Our goal is to remind the general population of the risk for insufficiency fracture and its risk factors as described above and the orthopedic surgeons of the risk of acetabular fracture, especially in patients with predisposing factors. We recommend all individuals who have one or more risk factors to undergo a full metabolic bone evaluation to determine their risk for future fractures and optimize their health condition.

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