Pelvic insufficiency fractures in the elderly: a challenging diagnosis

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Insufficiency bone fractures, result from a normal or repetitive load applied to a demineralized or osteoporotic bone[1].

Insufficiency pelvic fractures, namely the sacrum and pubis, are relatively common in the elderly[2]. However, iliac wing fractures are rare, and when documented are frequently associated to other pelvic fractures[3]. Postmenopausal osteoporosis is the most common predisposing factor. Other risk factors include: rheumatoid arthritis, radiotherapy, prolonged corticotherapy, chronic renal failure, and mechanical changes after hip replacement surgery[1]. Fractures can be spontaneous, with no history of trauma[2]. Clinically and radiologically, they must be distinguished from osseous metastases or infections.

The authors describe a case report that reflects the diagnostic challenge in detecting such fractures.

A 70-year-old, caucasian woman, presented with a prior history of Parkinson's disease, seronegative rheumatoid arthritis (no reference of corticotherapy), and severe osteoporosis (treated with oral bisphosphonates with irregular compliance) with fractures of bilateral distal radius in April 2011, and left parasymphyseal pubic avulsion-fracture in March 2014 (Figure 1), both of low-impact. Six months later, she refers insidious onset of low back and right buttock pain, 8 in 10 in intensity, with two weeks duration, and progressive deterioration (becoming disabling in the last week to independent gait), irradiating to the ipsilateral knee without paresthesia, not exacerbating with Valsalva maneuvers and decreasing with rest. She denied recent trauma and personal or family neoplasic history.

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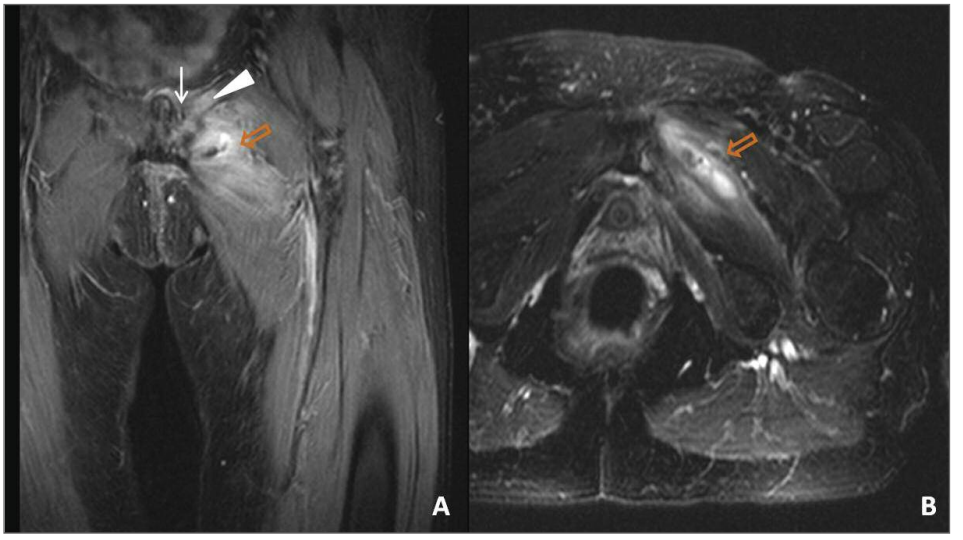

FIGURE 1. Coronal (**A**) and axial (**B**) STIR images of pelvic MRI showing left parasymphyseal pubic fracture (white arrow) with associated bone oedema (arrow head) and adjacent partial muscular avulsion (orange arrow), namely of the external obturador muscle (avulsion-fracture)

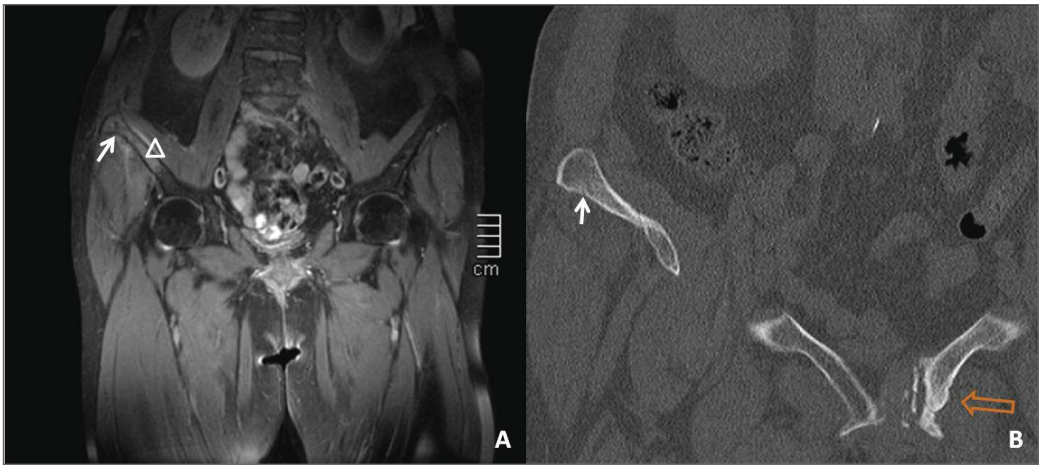

FIGURE 2. Coronal (A) STIR image of pelvic MRI showing diffuse bone oedema of the right iliac wing and adjacent soft tissue (arrow head) and apparent fracture line (white arrow), also perceptible on the coronal CT image (B) performed in the same date. There is also bone remodeling in the left parasymphyseal pubic region (orange arrow) of the previous fracture showed in Figure 1.

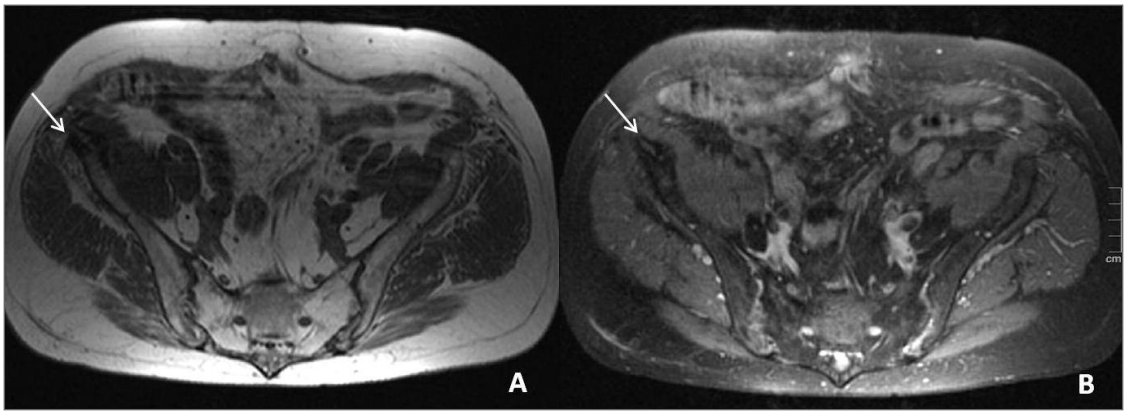

FIGURE 3. Axial T1-weighted (A) and STIR image (B) of pelvic MRI revealing right iliac wing bone oedema and adjacent muscle oedema resolution. Identified hypointensity focus at the level of anterior superior iliac crest on T1-weighted and linear hyperintensity on STIR, showing bone fracture line.

On examination, she was apyretic, with right iliac crest painful palpation. No neurological deficits were detected. Her analytic evaluation (complete blood count, serum biochemistry, acute phase reagents, phosphocalcic metabolism, vitamin D, parathyroid hormone and proteins electrophoresis) was within normal range.

Lumbar and pelvic radiographic studies showed diffuse osteopenia, without fractures images. Lumbar Computed Tomography (CT) scan was normal. Pelvic Magnetic Resonance Imaging (MRI) revealed diffuse bone marrow oedema of the right iliac wing with apparent fracture line (Figure 2A), also perceptible at pelvic CT complementary study (Figure 2B). Bone densitometry results with T-score of -4.5 and -3.4 of the lumbar spine and femoral neck, respectively. Treatment with zoledronic acid 5 mg intravenous was performed, and the patient had a favorable response to conservative treatment with gradual improvement of pain, mobility and independence for the gait.

Follow-up MRI after 3 months, identified hypointensity focus on T1-weighted and linear hyperintensity on T2, suggesting bone fracture line (Figure 3).

The combination of the background (including the history of insufficiency fractures elsewhere), physical examination and imaging findings, led us to the diagnosis of atypical iliac wing insufficiency fracture, being the rheumatoid arthritis and severe osteoporosis, the predisposing factors.

MRI is the best imaging diagnostic method in the detection of these fractures with a greater sensitivity (98% *vs* 53% in CT)[5]. Early recognition of these types of fractures, avoids unnecessary invasive procedures and late treatment, which is associated with increasing incidence of re-fracture and failure in bone healing, and may lead to chronic pain, loss of muscle strength, immobility and other indirect complications.

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