Case 14182
Subperiosteal hematoma of the ilium: an unusual complication of acetabular fracture

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Section: Musculoskeletal System
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Patient: 12 year(s), female

Clinical History

A 12-year-old female entered the Emergency Department after a fall on the buttock occurred while abducting and externally rotating the right hip. The patient experienced sudden onset of pain in the inguinal region, progressive tenderness in the iliac fossa and gait disturbance. There was no history of bleeding diathesis.

Imaging Findings

No hip fractures were revealed by a plain radiograph on the day of the injury (Fig.1). MRI demonstrated a lens-shaped lesion (maximum diameters: cranio-caudal, 14 cm; antero-posterior, 5.5 cm; latero-lateral, 2.5 cm), with smooth edges, overlying the internal aspect of the right iliac bone and extending homolaterally downward to the anterior wall of the acetabulum. The right iliacus muscle was dislocated medially; the adjacent psoas muscle was not involved. The lesion appeared isointense to skeletal muscle on T1-weighted images and heterogeneously hyperintense on T2-weighted images, being suggestive of a subperiosteal blood collection (Figs.2-3). Concomitantly, the anterior pillar of the right acetabulum presented with intense bone marrow edema, where a thin, hypointense line of fracture was seen (Fig.3c).
The patient was managed conservatively. Forty days after trauma, the subperiosteal hematoma was reduced in size (Fig.4) and the fracture line was not seen anymore. Complete recovery occurred within 6 months of the injury.

Discussion

We report a peculiar case of large subperiosteal iliac hematoma associated to an occult fracture of the anterior pillar of the acetabulum. Subperiosteal hematomas of the ilium are uncommon lesions that specifically occur in children and young adults as a result of a trauma [1-6]. In fact, in young patients the periosteum is loosely attached to the underlying bone and then at risk for traumatic detachment, which is responsible for injury of nutrient vessels and resulting subperiosteal hemorrhage [2]. The anterior pillar is an uncommon site of isolated acetabular fractures in young patients, which include elementary (anterior wall, posterior wall, anterior column, posterior column, and transverse) and combined fractures [7-8].

Clinically, in the acute phase after trauma, subperiosteal hematoma of the ilium is asymptomatic or poorly symptomatic with unspecific discomfort. Gradual worsening with painful limitation of hip motion occurs after a variable delay, usually of a few days [2]. In our case, the concomitant injury of the acetabulum certainly contributed to early development of symptoms such as groin pain and gait disturbance. Subperiosteal hemorrhage may also increase in size and determine neurological symptoms due to impairment of lumbar plexus nerves [3-6], which however were not involved in this case. The hematoma may evolve towards recovery with complete reabsorption, as observed in our patient, or towards progressive ossification [2]. Surgery should be considered if there is a worsening of symptoms or nerve suffering [6]; in our case, since there was no neurological impairment and the acetabular fracture was limited to the trabecular bone with no cortical interruption, conservative therapy was undertaken successfully.

Imaging is essential for diagnosis as well for surgical planning. Both CT and MRI may be helpful but this latter is preferable in young patients, as it does not use ionizing radiations. In acute and subacute phases after injury, a subperiosteal hematoma of the ilium is strongly suggested by a lens-shaped lesion confined between the internal aspect of the iliac bone, on the lateral side, and the iliacus muscle, on the medial side [2]. Importantly, since subperiosteal iliac hematoma may be poorly symptomatic, it may be undiagnosed in patients with no history of major trauma and incidentally discovered as a chronic ossified lesion in adulthood [9].

In conclusion, subperiosteal iliac hematoma should be suspected in young patients presenting with a history of recent hip trauma and poor or unspecific symptoms. MRI ensures optimal diagnosis and allows identifying concomitant injuries such as occult fractures.

Final Diagnosis

Subperiosteal iliac hematoma and trabecular fracture of the acetabulum

Differential Diagnosis List

Intramuscular hematoma of the iliacus [10-11], Iliac wing sign (Fig.5) that indicates various bone and soft-tissue injuries of the pelvis and hips [12]

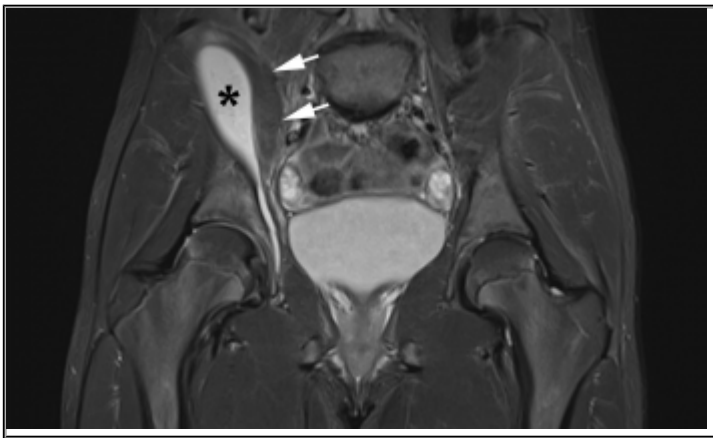
Figures

Figure 1 Anteroposterior plain radiography

The exam is unremarkable.

Area of Interest: Musculoskeletal system;
Imaging Technique: Plain radiographic studies;
Procedure: Diagnostic procedure;
Special Focus: Trauma;

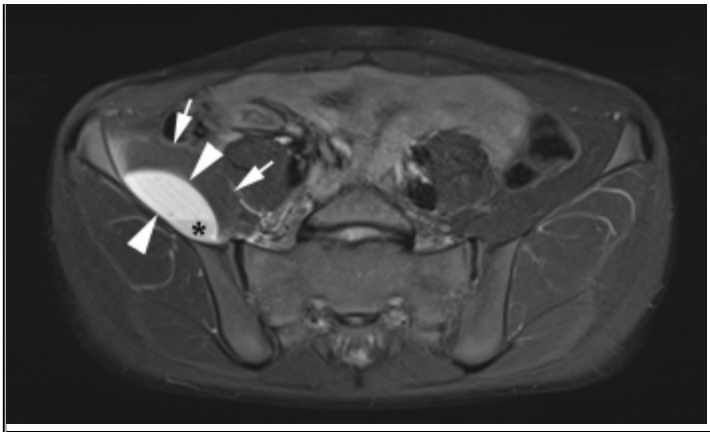
Figure 2 Coronal T2-weighted TIRM image



A large subperiosteal hematoma of the iliac bone (asterisk) appears as a hyperintense, lens-shaped lesion delimited between the internal aspect of the right iliac bone and the right iliacus muscle (arrows), which is shifted medially.

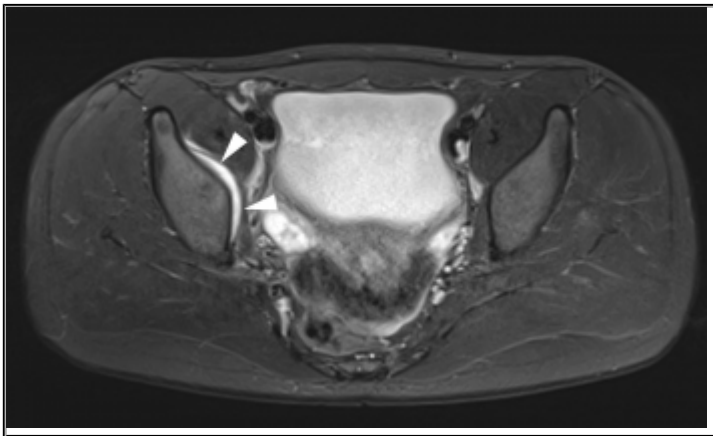
Area of Interest: Musculoskeletal system;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Trauma;

Figure 3 Axial T2-weighted TIRM image



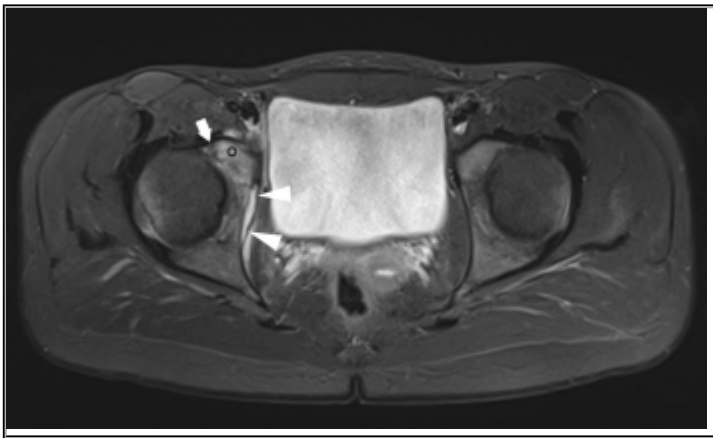
The subperiosteal hematoma (arrowheads) overlies the internal aspect of the right iliac bone. The right iliacus muscle (arrows) is dislocated medially. Within the hematoma, a fluid-fluid level is also seen (asterisk).

Area of Interest: Musculoskeletal system;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Trauma;



The subperiosteal iliac hematoma (arrowheads) extends downward to the acetabulum.

Area of Interest: Musculoskeletal system;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Trauma;

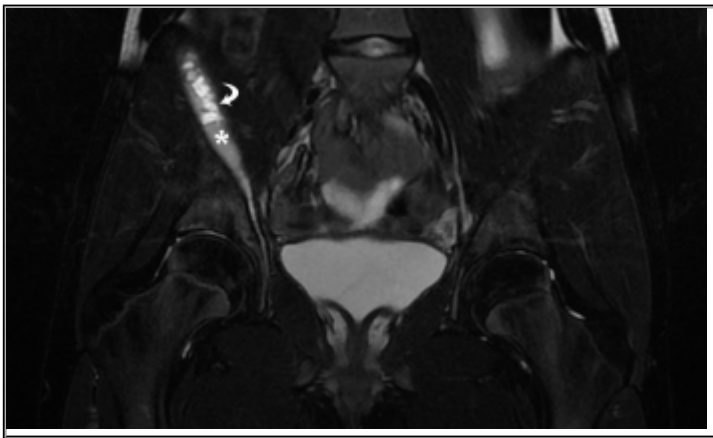


A concomitant trabecular fracture line of the anterior pillar of the acetabulum (thick arrow) is

seen in association with perifocal bone marrow edema appearing as a high signal area (circle).

Area of Interest: Musculoskeletal system;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Trauma;

Figure 4 Coronal T2-weighted fat-suppressed image forty days after trauma



Forty days after trauma, the subperiosteal hematoma of the right iliac bone (asterisk) is decreased in size. Within the collection, some clots can be seen (curved arrow).

Area of Interest: Musculoskeletal system;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Trauma;

Figure 5 Coronal T2-weighted fat-suppressed sequence in a different patient

The iliac wing sign" consists of linear edema-like signal at the iliacus muscle attachment entering the iliac wing (arrows). This should be differentiated from subperiosteal iliac hematoma as they often share a common clinical presentation.

Area of Interest: Musculoskeletal system;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Trauma;

References

[1] Choi HJ, Lee CC, Lim TH, Singer AJ (2009) Traumatic subperiosteal pseudoaneurysm: rare cause of subperiosteal hematoma Am J Emerg Med 27:1172 e1175-1177

[2] Guillin R, Moser T, Koob M, Khoury V, Chapuis M, Ropars M, et al. (2012) Subperiosteal hematoma of the iliac bone: imaging features of acute and chronic stages with emphasis on pathophysiology Skeletal Radiol 41:667-675

[3] Naude RJ, Thomson SR (1993) Femoral nerve palsy following a subperiosteal haematoma Injury 24:62-63

[4] Pirouzmand F, Midha R (2001) Subacute femoral compressive neuropathy from iliacus compartment hematoma Can J Neurol Sci 28:155-158

[5] Wallace M, Kruse R, Eutsler EP, Averill LW (2016) MRI findings of post-traumatic subperiosteal hematoma of the iliac bone with resultant femoral nerve palsy in an adolescent boy Pediatr Radiol 46:1350-1353

[6] Weiss JM, Tolo V (2008) Femoral nerve palsy following iliacus hematoma Orthopedics 31:178

[7] Heeg M, Klasen HJ, Visser JD (1989) Acetabular fractures in children and adolescents J Bone Joint Surg Br 71:418-21

[8] Scheinfeld MH, Dym AA, Spektor M, Avery LL, Dym RJ, Amanatullah DF (2015) Acetabular fractures: what radiologists should know and how 3D CT can aid classification Radiographics 35:555-77

[9] Ben Zakoun J, Dallaudiere B, Palazzo E, Lefere M, Monteil J, Dieude P (2014) Chronic ossified subperiosteal hematoma of the iliac bone Diagn Interv Imaging 95:889-891

[10] Holscher RS, Leyten FS, Oudenhoven LF, Puylaert JB (1997) Percutaneous decompression of an iliopsoas hematoma Abdom Imaging 22:114-6

[11] Wada Y, Yanagihara C, Nishimura Y (2005) Bilateral iliopsoas hematomas complicating anticoagulant therapy Intern Med 44:641-3

[12] Kakigi T, Hosono M, Shimono T, Hiraoka T, Nishimura K (2012) The iliac wing sign: an indicator of the presence of bone and/or soft-tissue injury of the pelvis and hips Eur J Radiol 81:2348-52

Citation

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