

Clinical-Medical Image

Essential Bone Cyst: Fallen Fragment Sign and Trap Door Sign

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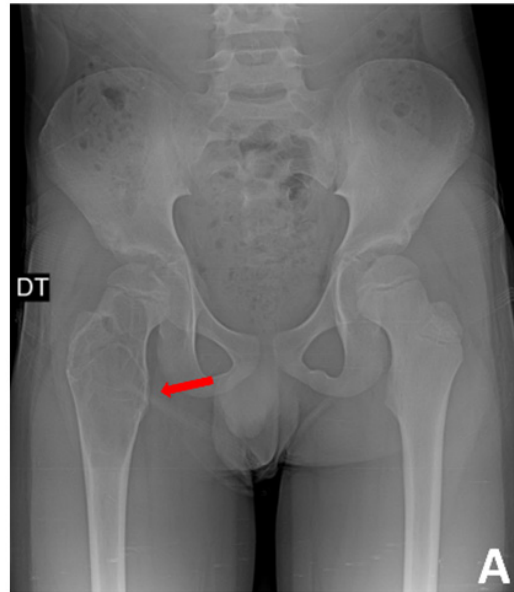


Figure 1: Frontal radiograph of the pelvis of a 15-year-old boy, presenting with right hip pain with total functional impotence, following a trauma at home, showing a bony lacunar lesion centered on the proximal right femoral metaphysis, lytic, expansive, with sharp contours, thinning of the bone cortex opposite and surrounded by a fine dense border of osteosclerosis on the diaphyseal side, giving the appearance of an “egg cup”.

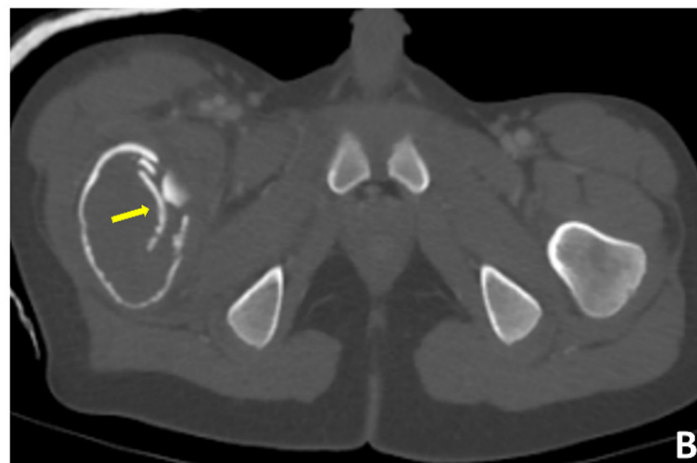


Figure 2: Injected CT scan in axial section showing a right proximal femoral metaphyseal lytic bone lesion, centromedullary, of liquid density, non-enhanced after injection, associated with fractures realizing the aspect of the “fallen fragment sign” (yellow arrow) confirming the diagnosis of essential bone cyst complicated with fractures.

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Figure 3: CT scan in coronal section showing a fracture with a “trap door sign” (white arrow).

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The essential or solitary or unicameral bone cyst is a cystic bone dystrophy of unknown origin producing a pseudo-tumor lesion, in the form of a uni or plurilocular metaphyseal bone cavity weakening the bone and containing a clear, lemon-yellow, but sometimes hemorrhagic fluid [1]. It affects mostly children between 5 and 15 years of age, with a predominance of males, is most often discovered by chance [2], is often unique and is generally located on the upper metaphysis of the long bones (humerus 50%, femur 25%, tibia) [1,2]. On standard radiography, the typical KOE appears as an ovoid lacuna of geographic osteolysis, without a septum, centered in the metaphyseal region in contact with the conjugation cartilage, with a major axis parallel to the bearing bone, with clear, well-limited contours, with peripheral sclerosis, more accentuated on the diaphyseal side, creating the “egg cup” appearance (Figure 1). The cortices are thinned but respected. It may contain fine internal septa [1]. The CT scan reveals a thin-walled, often pseudoseptate, osteolytic lesion with fluid density. Its main interest is to evaluate the thickness of the cyst walls, the potential fracture risk and the extension of the lesion into a complex region, such as the spine or pelvis [1]. Fracture is the most frequent mode of revelation. Two radiographic aspects can be found: -the pathognomonic “fallen fragment sign”, corresponding to the presence of cortical fragments that settle at the bottom of the cyst and that change position with the patient’s mobility [1,2] (Figure 2) and the “trap door sign” with the fractured bone fragment remaining attached to the periosteum (Figure 3) [1]. MRI confirms the cystic nature of the lesion. The typical KOE appears as a single lacuna, without septa with fluid content in hyposignal T1 hypersignal T2. After injection of gadolinium, the periphery of the cyst and any septa may be enhanced. A liquid level is rarely found. A fractured KOE may be the site of fluid levels with intracystic hemorrhage and sedimentation of old blood and may show pseudonodular enhancement [1,2].

Keywords: Essential bone cyst; Fallen fragment sign; Trap door sign; Imaging

Conflict of Interest

The authors declare that they have no conflict of interest in relation to this article

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