Multimodality imaging in a patient with hydatid disease of the pelvic bone

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DESCRIPTION

A 50-year-old man presented to the orthopaedic outpatient department with a history of fever with chills and chronic right gluteal region swelling with sudden onset increase in size following trivial trauma. On local examination, there was localised warmth with swelling and tenderness in the right gluteal region and restricted hip movements. Routine blood investigation revealed haemoglobin of 62 g/L, total leucocyte count of 15.6×10^9 cells/L and raised C reactive protein.

Anteroposterior pelvic radiograph (figure 1A) demonstrated multifocal lytic lesions of the right ilium, ischium, pubis and sacral ala. Ultrasonography of the abdomen (figure 1B) demonstrated hypoechoic collection in the right iliopsoas with near total loss of muscular architecture. MRI of pelvis (figure 2A,B) demonstrated two large communicating multiseptated T2/short tau inversion recovery hyperintense collection in the right lumbar region extending into the retroperitoneal and paraspinal region which were in communication with similar lesions in the right iliac fossa and gluteal regions. Inferiorly, there was extension into the proximal thigh with few round lesions showing internal membranes. There was near total destruction of the right hip joint and iliac bone. Plain CT of the abdomen and pelvis (figure 1C–F) demonstrated multiple subcutaneous, intramuscular, intra-abdominal and pelvic isodense to hypodense collections with the retroperitoneal and subcutaneous collections showing internal fat component and rim calcification. Based on imaging findings, possibility of hydatid disease was raised, surgical excision was performed. Histopathology of the specimen revealed features of hydatid disease.

Hydatid disease is a parasitic infection caused by *Echinococcus granulosus*,¹ most commonly affecting the liver and lungs.² Bone hydatid disease commonly involves vertebrae (30% of cases) followed by pelvis (20%).³ In bone hydatid, there is no pericyst formation with the vesicles replacing the osseous tissue and causing cortical erosion with extension into the surrounding tissue.^{4–6} The extraosseous part of the lesion may show calcification unlike the intraosseous part which rarely shows calcification.⁵ The characteristic findings of bone hydatid on a radiograph are coarsened bony trabeculae with honeycomb pattern, bone expansion with cortical thinning and soft tissue swelling with calcifications.⁷ Typical CT findings are multiloculated osteolytic lesions with features of bone expansion, cortical thinning and adjacent soft tissue component.¹ MRI can be used in assessment of the soft tissue component, which appears as multiple

Figure 1 (A) Anteroposterior radiograph of pelvis demonstrates lytic lesions (white arrows) in the right ilium, ischium, pubis and acetabulum, (B) ultrasound image demonstrating hypoechoic collection in the right psoas region, (C, D) CT images demonstrating lytic lesions (white arrow) in the pelvic bone with intra-abdominal and subcutaneous isodense lesions with peripheral calcification (white arrow), (E, F) CT images demonstrate daughter cyst (white arrow).

vesicles showing a cyst within cyst appearance, which appears hypointense on T1 and hypo-hyperintense on T2 weighted images. The outer layer of the cyst

Figure 2 (A) Coronal T2 fast recovery fast spin echo (FRFSE) image demonstrates daughter cyst within the cystic lesion (white arrow) and (B) sagittal T2 FRFSE image demonstrates separated membrane from the cyst wall (serpent sign) (white arrow).

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Images in...

represents pericyst which appears hypointense on T2 weighted images (rim sign), however pericysts are absent in bone hydatid. Detached membrane from cyst wall appears hypointense on all sequences (serpent sign).⁸

Imaging differentials include chondromyxoid fibroma, metastasis, chondrosarcoma, haemophilic pseudotumour, giant cell tumour, aneurysmal bone cyst and osteomyelitis (tuberculous). Solitary lesions can mimic simple bone cyst, plasmacytoma and brown tumour of hyperparathyroidism, while chronic hydatidosis can mimic fibrous dysplasia.⁹ Histopathological examination of the resected tissue is confirmatory of the diagnosis.¹⁰ Surgical excision of lesion with chemotherapy is the preferred treatment modality for bone hydatid, however advanced disease carries grave prognosis and surgery is a risky option in such cases.¹¹

Learning points

- ▶ Key imaging of hydatid disease on radiograph and CT are lytic lesions with expansion of bone and thinning of cortex. Extraosseous component shows calcification.
- ▶ On MRI, hydatid cyst appears hyperintense with hypointense wall on T2 weighted images. Separated membrane from wall produces serpent sign.
- ▶ Key differentials for hydatid disease of bone should be kept in mind while reviewing images.
- ▶ Travel history and endemicity are important histories to be elicited.

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