Clinical Quiz

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Fig. 1


Fig. 2

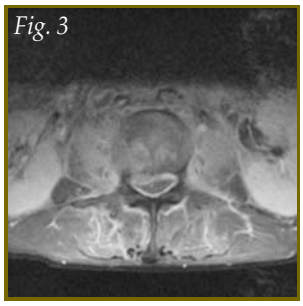
Fig. 3


Fig. 4

Clinical history:

- M/44. Presented with low back pain.
- MRI scan of the L-S spine was performed.
- Please comment on the imaging findings and give your diagnosis.

Diagnosis:

Infective spondylodiscitis of L2-3 with mild epidural extension.
Osteomyelitis of right ilium.

Answer to Clinical Quiz

MRI findings:

1. TIW hypointense and T2W hyperintense areas were seen at the L2-3 vertebrae. The L2-3 disc and adjacent end plates were also involved with T2W hyperintense signal and loss of L2-3 disc height. Mild pre-, para- and epidural extension of lesion were also present. Mild focal spinal stenosis was noted at L2-3 level with crowding of nerve roots. Areas of contrast enhancement were seen at these lesions, indicating active disease.
2. Fusion of T12-Ll vertebral bodies seen with mild anterior wedge deformity. Mild posterior bulge with associated area of T2W hyperintense signal was seen at mid posterior portion of the fused T12-Ll vertebral bodies mildly indenting the thecal sac. No significant compression of the conus medullaris detected. Mild heterogeneous enhancement was seen at this region might represent residual inflammatory changes from previous episode of spondylitis.
3. Bilateral psoas muscles were also involved which were swollen with contrast enhancement and T2W hyperintense signals. No obvious drainable paraspinal abscess was detected.
4. Enhancing T2W hyperintense areas were also seen at the right ilium suggestive of active infection as well.

Operative/histological findings:

Fluroscopic guided percutaneous bone biopsy of L2-3 vertebrae was performed. Histological examination of the tissue obtained showed acute inflammatory changes. Culture revealed staphylococcus aureus. Patient was given appropriate antibiotic therapy.

Discussion:

Pyogenic infections of the spine involve primarily the disc space in children and the vertebral bodies in adults. Men are affected twice as often as women and adults in the sixth and seventh decades are more commonly affected. The lumbar spine is most frequently involved. Predisposing factors include diabetes, use of steroid or chemotherapy for cancer, immunological disease and IV drug abuse. Staphylococcus aureus accounts for 60% of adult infections, while Escherichia coli, Pseudomonas aeruginosa and Klebsiella account for another 30%.
The patient's symptoms often precede the radiographic findings by several weeks. Culture of the disc material obtained by needle biopsy are negative in 50-70% of patients.

The MRI findings of discitis and osteomyelitis closely match the pathological findings. The signal alternations reflect the early inflammatory response characterised by infiltration of polymorphonuclear leukocytes and fibrin deposition in the adjacent end plates. Bony destruction secondary to lytic enzymes and the associated increased water content are reflected by the increase T2W signal intensity and the decreased signal intensity on TIW images. MRI is the most sensitive imaging technique to make the diagnosis. However the MRI findings may lag behind the clinical symptoms of back pain. If the diagnosis is uncertain, a follow up MRI in a week may show the evolution of the early changes. Similarly the MRI findings may lag behind the healing phase of vertebral osteomyelitis. Thus in the early stages of treatment, laboratory findings such as ESR and
white cell count are more helpful in monitoring the response to treatment than the MRI findings.

MRI is helpful in the detection of epidural extension of infective spondylodiscitis. The complete extent of involvement and the degree of cord compression are both clearly delineated by MRI. Gadolinium is useful to distinguish epidural granulation tissue from a frank abscess. Epidural granulation tissue enhances homogeneously while an epidural abscess will be enhanced at its periphery and contains non-enhancing pus in its centre. This differentiation may be helpful in surgical planning.

The findings of healing osteomyelitis include persistent disc space narrowing, decreased T2W signal intensity of the disc consistent with disc degeneration, fusion of adjacent vertebral bodies, and resolution of the high T2W signal intensity in the adjacent end plates corresponding to resolution of the oedema. If an epidural abscess was present, the epidural space also returns to normal.

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