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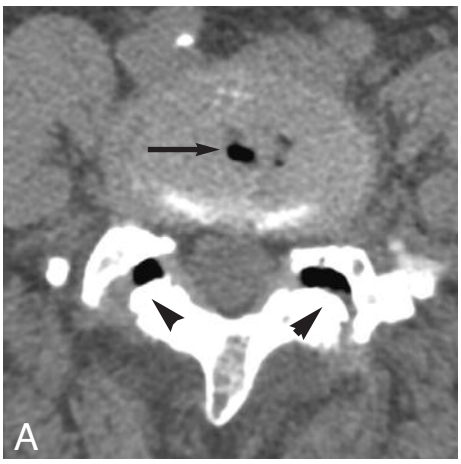
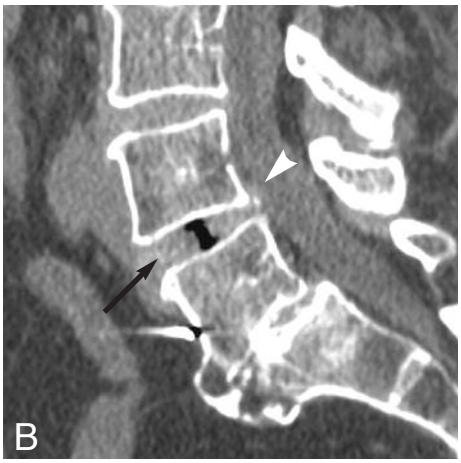
IMAGES IN CLINICAL RADIOLOGY





Unusual vacuum phenomenon suggesting occult vertebral instability

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A 70-year-old female was referred to our department with complaints of bilateral lumbar sciatalgia. Lumbar CT was performed. Bilateral spondylolysis of L5 with secondary olisthesis had been previously surgically stabilised by anterior arthodesis. Ankylosis appeared effective at this level.

On sagittal MPR the vertebra L4 and L5 seemed lined up well. Nevertheless our attention was retained by an unusual large diastasis of the L4-L5 joints (A, black arrowhead) and this diastasis was occupied by massive vacuum phenomenon. An unusual central vacuum phenomenon was also visible in the L4-L5 disk (A & B, black arrow).

It was suggested that this diastasis could be due to a realignment of the vertebra L4 in the supine position (B, white arrowhead).

Complementary upright plain film of the lumbar spine were performed in flexion and extension and revealed a sharp instability of L4 with olisthesis (C, white arrowhead) but also subsidence of the L4-L5 disk when compared with supine CT.

Comment

Many radiological manifestations of vacuum phenomenon (VP) only represent snapshots of a complex dynamic hydropneumatical continuum extending from true VP to gas and/or fluid and vice versa. In the majority of cases VP remains an incidental or anecdotal finding but, nevertheless, it occasionally represents a useful clinical or radiological sing of critical importance for the understanding, clinical diagnosis, prognosis and therapeutic of several spinal diseases.

VP is frequently observed in facet joints during supine CT especially in association with articular arthritis with or without olisthesis.

It only represents an acute transitory phenomenon produced by distraction of joint during supine CT or MR examination.

Sometimes, however, when the distraction is unusually large, the VP can alert the radiologist that there is instability at that level and that measurement of antero-posterior diameter of the central canal will seriously underestimate the true level diameter.

As with discs and vertebrae gas can progressively replace VP in distracted joint and may consequently be forced within cysts of the ligamenta flava, extraspinal expansions of the facet joint or subchondral bone erosions.

In sufficiently prolonged supine position a progressive replacement of gas by fluid may also produce and this replacement has been reported by MR.

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