Gas in spinal articulations

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Summary. The purpose of this review is to illustrate, some for the first time, a variety of gas collections in lumbar facet joints and intervertebral discs and in the sacroiliac joint.

Key words: Gas collections – Lumbar facet joints – Intervertebral discs – Sacroiliac joint

Facet joint

Although gas within degenerated facet joints is a familiar CT finding [1], gas within synovial cysts has been reported infrequently [2, 3] (Fig. 1). Degeneration of the facet joint, in particular at L4-5, leads to synovium-lined cystic structures usually medial to the joint that communicate with the joint space [4-6]. Synovial cysts between the ligamentum flavum and the lamina near the joint have been reported in both anatomic [7] and arthrographic [8] studies. The CT appearance of a gas filled cyst in this location (Fig. 2) has not been reported previously. Another location of synovial cysts is posterior to the facet joint. CT demonstration of gas in one of these cysts which has not been described previously is illustrated in Fig. 3. Sequential CT studies may show the synovial cysts filled alternately with fluid or with gas suggesting a communication of the cyst with a joint, in which gas collects as a result of the "vacuum phenomenon" (Fig. 1). In some cases the cyst wall is thin enough that when the cavity fills with gas the wall is not resolved (Fig. 4). Subchondral erosions, another manifestation of facet joint degeneration, may also contain gas, indicating that the erosion communicates with the joint space (Fig. 5).

Intervertebral disc

Gas replacing portions of a degenerated nucleus pulposus is a familiar observation that does not require illustration [9-10]. Other collections of gas in the disc should be emphasized. Gas within the annulus of an otherwise normal disc has been recorded [11] (Fig. 6). Clinically it appears to have little significance. Gas may also be noted in the periphery of an annulus fibrosus which is bulging due to degeneration (Fig. 7). Gas near the periphery of a disc therefore does not necessarily signify herniation. Gas collections in the annulus must be distinguished from gas-containing nuclear herniations which appear as a focal displacement of the disc margin or a soft tissue fragment in the epidural space, or even in the dural sac (Fig. 8) [12-16]. A disc fragment with or without gas could conceivably be mistaken for a synovial cyst if it were located just medial to the facet joint. Other causes of intraspinal gas have been recorded [13-15, 17].

Sacroiliac joint

Gas has been observed incidentally in a sacroiliac joint, presumably as a result of a vacuum phenomenon (Fig. 9). It was not associated with any important clinical symptomatology in the case we examined. This CT finding has not been reported previously.

Discussion

With the exception of the herniated disc and one synovial cyst, the cases illustrated here have not been verified anatomically because the clinical findings were minimal and poorly correlated with the structure containing gas. Review of the patients' histories
Fig. 1. a Gas-containing synovial cyst (arrow) adjacent to the degenerated right L4-5 facet. Contralaterally, a gas collection (arrowhead) is seen in a subchondral erosion. b Low-dose metrizamide CT scans at the same level one month later show that fluid has replaced the gas in the synovial cyst

Fig. 2. Gas (arrow) in a presumed synovial cyst between the ligamentum flavum and inner surface of the left lamina. Gas (arrowhead) is also present in the facet joint

Fig. 3. Gas (white arrow) in a presumed synovial cyst posterior to the facet joint

and charts in our cases failed to reveal any evidence of instrumentation or of coincidental infection, to suggest an alternative explanation for the intraspinal gas. These gas collections were therefore presumed to be incidental. They must be distinguished from others with greater clinical significance, such as abscesses due to a gas-forming organism.

References