The Epidural Gas Pseudocyst – a treatable cause of back pain

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Authors: Authors: M W Elias, C Groves
Responsible Author: C Groves
E-mail: Clare.Groves@bradfordhospitals.nhs.uk
Affiliation: Bradford Teaching Hospitals NHS Trust Duckworth Lane, Bradford, BD9 6RJ
Patient: 53 years, female

Clinical History:

Summary of clinical context: 3 patients with lower back pain were found to have epidural gas pseudocysts using cross sectional imaging. The observation of gas in the epidural space is an important finding as it can be a potentially treatable cause of patient symptoms.

Imaging Findings:

Patient Data: 3 patients, age range 53-75 Sex: 1 female; 2 male Clinical history: All 3 patients presented with lower back pain. Case One had a radiculopathy in the left L5 distribution with associated parasthesia, while Cases Two and Three complained of bilateral leg pain without significant neurology. Plain radiographs demonstrated extensive degenerative disease within the lumbar spine, and an intradiscal vacuum phenomenon was present in all three cases. Cross-sectional imaging revealed the presence of epidural gas pseudocysts. The pseudocyst position in these cases did not correspond to neurological deficit, and surgery was not therefore thought to be appropriate. Case One improved with a local anaesthetic block. Cases Two and Three responded to physiotherapy and simple analgesia.

Discussion:

Discussion: The formation of pockets of nitrogen gas within intervertebral discs is a recognised complication of degenerative spinal disease[1]. Known as the vacuum phenomenon, it can be visualised with plain radiography, MR and CT, and occurs predominantly in the lower lumbar spine. Gas-containing pseudocysts have been observed as spherical bubbles within the epidural space[2-4]. They are associated with disc herniation and a direct connection with the intervertebral discs through an annular tear has been observed[5,6]. Gas chromatograph analysis of the gas aspirated from these pseudocysts has demonstrated nitrogen, thus confirming that they almost certainly originate from the gaseous degeneration of intervertebral discs[7]. The pseudocyst wall has been shown to consist of fibrous material, and their firm non-compressible nature is suggested by their ability to displace nerve roots[1,3]. Gas-containing pseudocysts may present as a spinal mass causing pain and radiculopathy. However, whilst they may be asymptomatic, there is a range of severity reported through to complete nerve palsies[8,9] and cauda equina syndrome[10]. When epidural gas is demonstrated it may be intradural or extradural. Epidural gas is also associated with far lateral disc extrusions and, in up to 2%, intradural disc extrusions[10-12]. These findings are relevant to management planning. The management options depend upon the clinical context and range from observation, injection of steroids, aspiration (percutaneous or surgical)[15-16] through to surgical options including
laminectomy or pseudocyst excision.[13-14]

**Differential Diagnosis List:** Final diagnosis: Epidural gas pseudocyst.

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**References:**


Description: Axial CT of lower lumbar vertebra showing epidural gas pseudocyst (arrow). Note mass effect with posterior displacement of the thecal sac. Origin:
**Figure 2**

**Description:** Axial CT at lumbosacral level demonstrating an anterior epidural gas pseudocyst (arrow).

**Origin:**
Figure 3

Description: Sagittal T1W MR demonstrating the vacuum phenomenon (arrow). Origin:
Description: Sagittal reformatted CT demonstrating epidural gas pseudocyst (black arrow) and associated vacuum phenomenon (white arrow). Origin:
Description: Coronal reformatted CT showing epidural gas pseudocyst (arrow) displacing the traversing left S1 nerve root (arrowhead). Origin:
Figure 6

Description: Fig 3a. Axial T2W, and Fig. 3b T1W MR demonstrating low-signal gas pseudocyst in the exit foramen (black arrow). Note proximity to the exiting nerve root (white arrow).

Origin: