Symptomatic epidural gas cyst treated with epidural block and percutaneous needle aspiration

-A case report-

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A 68-year-old woman suffered from lower back and radiating pain on her right buttock and posterior calf. Axial magnetic resonance imaging showed a 7 × 7 mm nodular lesion (T1 and, T2 low signal intensity) at the epidural space between the L5-S1 level and computed tomography revealed it was an epidural gas cyst. The authors performed an epidural block and percutaneous needle aspiration of the epidural gas cyst. The patient showed almost complete resolution of symptoms one year later. The authors suggest that an epidural nerve block with needle aspiration of a gas cyst could be an alternative treatment option for patients with a symptomatic epidural gas cyst before surgery. (Korean J Anesthesiol 2012; 62: 379-381)

Key Words: Aspiration, Cyst, Epidural, Gas, Intraspinal.

In 1980, Gulati and Weinstein [1] first reported about free gas in the spinal canal in 3 out of 79 patients examined for lumbar spinal stenosis with computed tomography. The clinical significance of an epidural gas cyst is that it may cause lower back or radicular pain due to compression of the dural sac and nerve root. Symptomatic epidural gas cysts have been treated mostly by evacuation of the gas cyst through surgery [2-5]. We present a case in which a symptomatic epidural gas cyst was treated with an epidural block and percutaneous needle aspiration of the gas cyst.

Case Report

A 68-year-old woman suffered from lower back and radicular pain on her right buttock and posterior calf. The patient underwent a spinal fusion due to similar symptoms three years prior to her visit. Symptoms were mildly relieved after the operation but still exacerbated by standing and walking, and were only relieved when the patient was in a recumbent position. Her visual analogue scale (VAS) score for radicular pain was 7–8/10. Physical examination revealed no sensory

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disturbance in the posterior aspect of the calf, and no limited flexion or, toe-raising weakness on the right side. Straight leg-raising test was positive at 60 degrees on the right side. The reflex status in both the lower extremities was intact. Laboratory values were within normal limits.

Magnetic resonance imaging (MRI) of the lumbar spine demonstrated L3/L4/L5 posterior fixations, a laminectomy state and diffuse disc bulging at L2-L3 and, L4-L5. The axial MR image showed a 7×7 mm nodular lesion (T1, T2 low signal intensity) at the epidural space between the L5-S1 level (Fig. 1), which was revealed as gas on the computed tomography (CT) scan (Fig. 2A and 2B).

The authors performed selective transforaminal epidural nerve block via the right first sacral foramen which resulted in 50% remission of the radiating pain. The authors planned to perform percutaneous needle aspiration of the gas cyst. To find the exact location of the aspiration site, 1.0 ml of contrast media was injected, with a 21 gauge epidural needle, into the epidural gas cyst via the L5-S1 posterior epidural space under fluoroscopy. We removed the epidural needle and the patient was sent to the CT room. Contrast filling into the epidural gas cyst was confirmed by CT scan (Fig. 2C and 2D). By repeating

the same procedure, the epidural needle was placed into the epidural gas cyst filled with contrast media under fluoroscopy. Nearly 1.0 ml of contrast media was aspirated. The epidural needle was slightly withdrawn and 4 ml of mepivacaine 0.5% with 5 mg of triamcinolone was instilled into the epidural space around the cyst. After the needle aspiration of the gas cyst, her VAS score for lower back pain was 1–2/10 and the patient had almost complete resolution of radiating pain one year later.

Discussion

In the spine, the presence of gaseous collections or vacuum phenomenon can be found in the intervertebral disc spaces, vertebral body, and spinal canal. The incidence of the vacuum disc phenomenon increases with age, and it has been reported in approximately 50% of patients over 40 years of age [6]. The gas formed in the disc was first analyzed by Ford et al. [7], who reported that the gas was 90–95% nitrogen. Yoshida et al. [2] reported cases of lumbar intraspinal gas causing clinical symptoms of lumbar radiculopathy and analyzed the composition of the gas in one patient by gas chromatography, which revealed an overwhelming preponderance of nitrogen.

Fig. 1. Magnetic resonance (MR) images. (A, B) Sagittal T1-weighted and T2-weighted MR images show a low signal nodular lesion. (C, D) Axial T1-weighted and T2-weighted MR images show a 7×7 mm nodular epidural lesion (low signal intensity on T1 and T2-weighted images) at the L5-S1 spinal level, abutting the right S1 nerve root.

Fig. 2. Computed tomography (CT) images. (A, B) CT shows an epidural gas cyst and vacuum phenomenon within the L5-S1 disc, with disc space loss. (C, D) CT shows the 1.0 ml contrast media injected into the epidural gas cyst to help find the exact location of the aspiration site, which was confirmed by CT scan.

It has been postulated that the entrapped gas formed within the degenerated vacuum disc or apophyseal joint space is extruded into a herniated disc fragment, or the epidural and paravertebral space through tears in the anulus fibrosus or the apophyseal joint ligaments [4].

The gas has low signal intensities on both the T1- and T2-weighted MR images. It is difficult to distinguish between gas and calcification, as both gas and calcifications display low signal on MR images. MR imaging supplemented by CT may be helpful in distinguishing gas from calcification. Kakitsubata et al. [4] reported that CT discography is most helpful in establishing communication of the epidural cyst with the disc tissue. They confirmed a connection between the epidural cyst and the corresponding intervertebral disc on the CT discography visualized as a flow of the contrast material in the two cases. Although connection between the epidural gas cyst and the corresponding intervertebral disc was not confirmed in this case, multilevel vacuum disc phenomenon at T12-L1, L2-L3, and L5-S1 was revealed. We also believe the origin of the epidural gas cyst was degenerated vacuum disc.

There were two former case reports referring to percutaneous CT-guided needle cyst aspiration. Demierre et al. [8] reported S1 radicular pain related to an intraspinal gas pseudocyst and they obtained resolution of the symptoms via needle puncture of the gas-filled cyst under CT guidance. However, the radicular symptoms recurred twice, and the surgeries were done twice. Bosser et al. [9] reported L5 radicular pain related to an epidural gas-containing pseudocyst. They obtained transient resolution of the radicular pain after gas aspiration via CT-guided needle puncture, but the radicular pain recurred soon after. Sequential CT scan showed recurrence of the epidural gas collection, and which led to surgical treatment.

To our knowledge, treatment of symptomatic epidural gas cyst by epidural block and aspiration has not yet been reported. Until now, the exact pain mechanism of epidural gas cysts have not been fully explored. The first mechanism for symptom relief is assumed to be the anti-inflammatory effect of the epidural block. However as the symptoms were not completely relieved by the epidural block, we assumed that an epidural gas cyst might have a role in the space occupying the lesion. Therefore, we performed needle aspiration on the epidural gas cyst, and

achieved remission of the symptoms. One year later after the procedure, the patient's VAS score for lower back pain was 1–2 and it was controlled with intermittent analgesic medications. We think that the suspected cause of her lower back pain was related to a previous spinal surgery rather than the epidural gas cyst. Her radicular pain was almost completely resolved, and has not recurred.

We report a case of symptomatic epidural gas cyst treated with an epidural block and percutaneous needle aspiration. Clinical symptoms of the epidural gas cyst can be similar to those of other more common causes of lumbar radiculopathy. The authors suggest that an epidural nerve block with needle aspiration of a gas cyst could be an alternative treatment option for patients with radicular symptoms caused by symptomatic epidural gas cyst before surgery.

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