L2 Radicular Compression Caused by a Foraminal Extradural Gas Pseudocyst

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Gas pseudocysts are a rare cause of lumbar radiculopathy and most symptomatic gas pseudocysts are found within the confines of the spinal canal. A gas pseudocyst in the foramen causing lumbar radiculopathy is very rare. We present a case of a 67-year-old woman suffering from severe pain in the right leg. Computed tomography and magnetic resonance imaging revealed a gas pseudocyst compressing the L2 root at the right L2-3 foramen. The patient underwent cyst excision using the lateral transmuscular approach and her leg pain was improved after the operation.

KEY WORDS: Gas pseudocyst - Radiculopathy - Lumbar vertebra.
Four days after the operation, the VAS score was improved to 1 point and the patient was discharged.

**DISCUSSION**

The presence of intraspinal gas is an uncommon phenomenon. Teplick et al.\(^\text{10}\) observed only seven cases of intraspinal gas in a series of 2500 CT scans. The pathologic mechanism of intraspinal extradural gas pseudocyst is still unclear. Gas localized outside the intervertebral disc has been suggested to originate from the intervertebral disc and migrated through a tear in the annulus fibrosus due to the motion of the spine\(^\text{2,9,11}\). A weak point in the posterior longitudinal ligament caused by developmental impairment was also suggested to have a role in the formation of pseudocysts\(^\text{9}\). The gas in the disc, the so-called ‘vacuum phenomenon’, was reported to consist of 90-95% nitrogen\(^\text{4}\).

Yoshida et al.\(^\text{11}\) demonstrated by using gas chromatography that the major composition of gas aspirated from a gas pseudocyst was also nitrogen. They also demonstrated the flow of contrast media into the pseudocyst using CT after discography, which suggested the existence of communication between the intradiscal gas and the intraspinal gas pseudocyst\(^\text{11}\). Recurrence of the pseudocyst in the same location after surgery also suggested persistent migration of the gas from the intervertebral disc to the intraspinal canal\(^\text{1,3,11}\).

In the present case, we could not find any direct communication between the gas pseudocyst and the L2-3 intervertebral disc during the operation and the gas cyst was not accompanied by foraminal disc herniation. However, T2-weighted sagittal MRI showed that the gas pseudocyst was connected to the L2-3 intervertebral disc, which contained intradiscal gas. Therefore, a gas pseudocyst in the foraminal zone was assumed to originate from the gas in the L2-3 intervertebral disc.

A gas pseudocyst in the foraminal and/or extraforaminal zone is very rare. Cheng et al.\(^\text{2}\) reported a case of a large, far lateral extruded disc fragment that contained air. In the case, the nerve root was impaled by an unusual combination of a small extruded disc fragments, as well as an air-filled sac that was surrounded by the walled-off fragment’s capsule, which freely communicated with the gaseous degenerated disc space. They suggested the possibility of disc herniation, which should be seriously considered in cases of nerve root compression where epidural gas is present, especially those associated with gaseous degenerated discs. In the present case, the gas pseudocyst was located in the foraminal zone. The patient’s intractable leg pain seemed to be caused by the progressive enlargement of a gas pseudocyst in the narrow foraminal zone, which directly compressed the dorsal root ganglion. It was speculated that the motion of the lumbar spine induced a pressure gradient, so that the intra-
discal gas moved into the gas pseudocyst by the valve-pump mechanism\textsuperscript{11).}

Surgical excision is the optimal treatment for symptomatic gas pseudocyst. Recurrence of a gas pseudocyst was reported after percutaneous needle aspiration or surgery with needle aspiration\textsuperscript{1,3,11). In this regard, the patient in the present study underwent surgical excision of the gas pseudocyst using the lateral transmuscular approach. Decompression using the lateral transmuscular approach is an effective surgical option for pathologies in the foraminal and/or extraforaminal zone. It enables direct decompression with minimal damage to the surrounding anatomical structures\textsuperscript{6,7). In the present study, the patient showed a marked reduction of leg pain after surgical excision of the gas pseudocyst. However, further long-term follow-up evaluation is necessary because of the possibility of a delayed recurrence of the gas pseudocyst.

CONCLUSION

The authors report a rare case of foraminal extradural gas pseudocyst causing L2 radicular compression. The patient was successfully treated by surgical excision using the lateral transmuscular approach.

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References