www.jkns.or.kr 10.3340/jkns.2011.49.6.384 Print ISSN 2005-3711 On-line ISSN 1598-7876
J Korean Neurosurg Soc 49 : 384-386, 2011

Case Report

Sudden Foot Drop Caused by Foraminal Gas Pseudocyst

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A foraminal gas pseudocyst is a rare cause of lumbar radiculopathy. The association with a sudden foot drop has not been previously reported. Here, a 67-year-old woman with sudden foot drop on the left side is reported. Computed tomography and magnetic resonance imaging identified a foraminal gas containing lesion compressing the left L5 root at the L5-S1 foramen. The foraminal gas containing lesion compressing the L5 ganglion was successfully removed by the posterior approach. The histological diagnosis was a gas pseudocyst. This unique case of surgically proven gas pseudocyst indicates that it should be included in the differential diagnosis of patients presenting with sudden foot drop.

Key Words : Gas pseudocyst · Foramen · Foot drop.

INTRODUCTION

Intraspinal gas pseudocysts may be a cause of radiculopathy[2-4,7,8]; it has been assumed that they are related to an intervertebral vacuum phenomenon, and degenerative processes are usually responsible for vacuum phenomenon[10]. However, there is no prior report of sudden foot drop caused by a foraminal gas pseudocyst. Here, a case of foraminal gas pseudocyst causing sudden foot drop was successfully treated by surgical removal via the posterior approach. The pathophysiological mechanisms of this uncommon entity are discussed and the relevant literature reviewed.

CASE REPORT

A 67-year-old woman presented with sudden foot drop on the left side that occurred three days ago. On past medical history, the patient had hypertension for five years and chronic low back pain radiating to the buttocks, which had been treated conservatively. The patient denied any recent trauma. She complained of a sharp aching pain over the left buttock and intermittent radiating pain along the left L5 sensory dermatome. On physical examination, there was complete foot drop on the left side (motor power : Grade I) and hypoesthesia of the fifth lumbar root dermatome was detected. A plain X-ray showed degenerative spondylosis at the L5-S1 level, but there was no definite instability. Magnetic resonance imaging (MRI) showed low-signal intensity, a well demarcated, round mass lesion compressing the L5 root at the left L5-S1 foramen. This was revealed as the gas on computed tomography (CT) scan. However, there was no intervertebral vacuum phenomenon at the L5-S1 level. With the diagnosis of a gas pseudocyst compressing the L5 root in the foramen, emergency surgical intervention was performed. The gas containing lesion was removed by the posterior approach. A left L5-S1 total facetectomy and interbody fusion were performed to remove the gas containing lesion. During the surgery, a 1.8 cm well-demarcated tense oval-shaped pseudocyst filled with gas, which was compressing the L5 ganglion, was detected in the foraminal zone. There was no adhesion between the gas pseudocyst and the L5 root, and herniated disc material around the pseudocyst was not found. The thin wall of the gas pseudocyst was excised and completely removed (Fig. 2). The pathologic examination revealed a fibrous connective tissue wall with thin and irregular synovial like cells and infiltration of inflammatory mononuclear cells (Fig. 3). The patient showed marked improvement of motor power (Grade IV) with gradual recovery of the sensory deficits by six months after the surgery, and gained independent mobility.

DISCUSSION

Gas lucencies may be seen on X-ray and CT scans within the

• Received : October 20, 2010 • Revised : December 13, 2010
• Accepted : May 30, 2011
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intervertebral disc space or the spinal facet joints as radiological manifestations of a degenerative process referred to as the "vacuum disc phenomenon"[5,6]. However, the presence of intraspinal extradural gas at other sites is rare. Teplick et al.[9] reported only seven cases of intraspinal gas in a series of 2500 CT scans. Degenerative processes are thought to be responsible for vacuum disk phenomena; traumatic or infectious vacuum phenomena are rare. Gas may extend through a ruptured annulus toward a herniated disk, epidural or paravertebral space. Gas located within the facet joint may fill a synovial cyst[1,6]. The exact mechanism associated with an intraspinal extradural gas pseudocyst is unclear. Gas localized outside the intervertebral disc has been suggested to originate from the intervertebral disc and likely migrates through a tear in the annulus fibrosus with movement. A weak point in the posterior longitudinal ligament, caused by developmental impairment, has also been suggested to play a role in the formation of a pseudocyst. Yoshida et al.[10] reported on the flow of contrast media into the pseudocyst using CT after discography; this suggested the existence of communication between intradiscal gas and the intraspinal gas pseudocyst. Recurrence of the pseudocyst in the same location after surgery also suggested persistent migration of the gas from the intervetebral disc to the intraspinal canal. However, some of these communications may not be detected. In the present case, there was no direct communication between the gas pseudocyst and the L5-S1 intervertebral disc on magnetic resonance imaging and the gas pseudocyst was not associated with a foraminal disc herniation. Therefore, the origin of the gas pseudocyst from the gas in the L5-S1 intervertebral disc could not be confirmed by radiological studies. However, we believe it was possible that there was undetectable small amount of gas at L5-S1 intervertebral disc space. A gas pseudocyst in the foraminal or extraforaminal zone is extremely rare. To date, two cases of gas containing pseudocysts in this location have been described without histological confirmation; both cases manifested as radiating pain. Lee and Lee[4] reported an L2 radiculopathy caused by a foraminal gas pseudocyst. However, in that case, the gas pseudocyst was connected to the L2-L3 intervertebral disc, which contained intradiscal gas; which differs from the present case. Bosser et al.[2] reported L5 radicular pain related to a lumbar extradural gas-containing pseudocyst that was treated by CT-guided aspiration. Different from these prior cases, this case with a foraminal gas pseudocyst that was associated with a sudden foot drop, which was successfully treated by surgical removal of the pseudocyst.

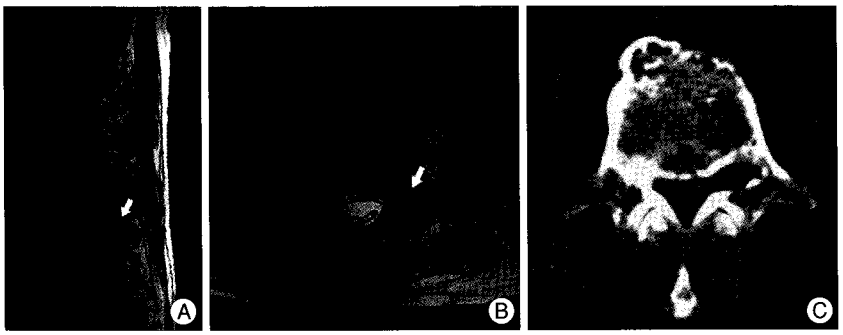

Fig. 1. A and B : T2-weighted sagittal and axial magnetic resonance images show a gas pseduocyst that is compressing the root at the left L5-S1 foramen (arrows). C : Computed tomography scan reveals a gas bubble within the foramen.

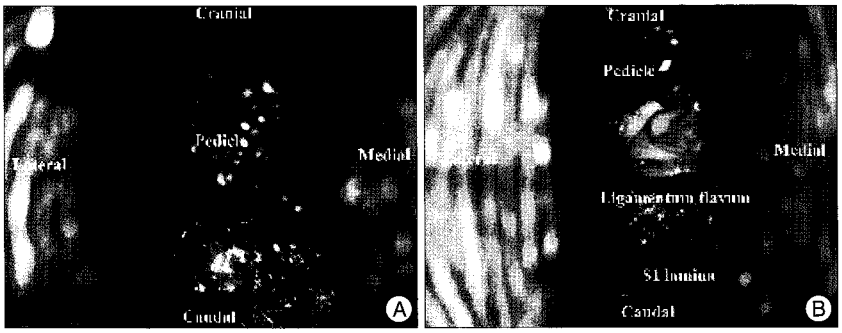

Fig. 2. A : After facetectomy and removal of ligamentum flavum, tense gas containing pseudocyst (*) is exposed. B : After total removal of gas pseudocyst, L5 nerve root (blue arrow) is totally decompressed.

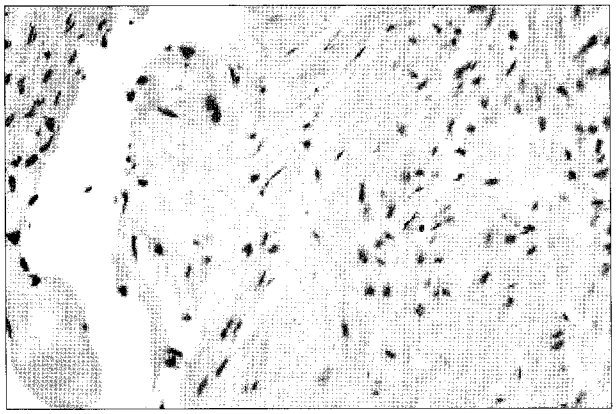

Fig. 3. Photomicrograph of the cyst shows irregular synovial-like cells and infiltration of inflammatory mononuclear cells (H&E ×100).

The definitive treatment for symptomatic gas pseudocysts is complete surgical excision. Recurrence of a gas pseudocyst was reported after CT-guided percutaneous needle aspiration or surgery with needle aspiration[2,3,10]. The patient in the present study underwent complete decompression and fusion to remove the lesion because she showed severe neurologic deficit. Moreover, percutaneous endoscopic removal via transforaminal approach was difficult to perform in case of high iliac crest at L5-S1 level. We couldn't perform endoscopic approach due to her high iliac crest. After emergency surgical excision of the gas pseudocyst, the patient showed a marked improvement of motor power.

CONCLUSION

This rare case of a surgically proven foraminal gas containing pseudocyst causing sudden foot drop indicates that it should be kept in mind in the differential diagnosis of patients presenting with sudden foot drop. A complete neurological recovery was achieved after prompt surgical excision.

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