Acta Med. Nagasaki 44 : 58－60

Epidural Calcified Sequestration of Cervical Intervertebral Disk

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A 57-year-old man with epidural calcified disk sequestration in the cervical spine, which was discovered after trauma, is reported. Differentiation between cervical disk herniation and other disease entities on magnetic resonance imaging (MRI) was difficult. The confirmation of the presence of extradural calcification by computed tomography (CT) was helpful in the diagnosis of this disease.

Key Words: cervical disk herniation, sequestrated disk, calcified disk, epidural mass, CT, MRI

Case report

A 57-year-old man was transferred to an emergency hospital due to trauma to the head and neck. He demonstrated quadriparesis on admission; and this was followed by right hemiparesis during one week of conservative treatment. He had had a traffic accident with neck trauma 14 years before. At that time, radiography of the cervical spine showed no definite abnormality.

One month later, he was admitted to our hospital for further examination and treatment. Cervical spine radiography revealed spondylosis most marked at C5-6 with disk space narrowing and spur formation, and no evidence of calcification at the intervertebral disks or spinal canal (Fig. 1). MRI demonstrated a large extradural mass compressing the spinal cord at the C4-C5 level (Fig. 2A,B). The mass had slightly high intensity on both T1 and T2 weighted images. There was a low intensity rim at the periphery of the mass on axial T1 weighted images (Fig. 2C). Although MRI showed disk degeneration at C5-6, continuity of the extradural mass with that disk was not observed. Spinal cord injury was not detected on MRI. CT performed after MRI showed ring-like calcification corresponding to the low intensity rim of the mass on MRI (Fig. 3).

Figure 1 Calcification is not evident in the spinal canal or disk spaces on lateral plain radiography.

To decompress the spinal cord, removal of intervertebral disk materials at C3-C4 and C4-C5 and subtotal removal of the C4 vertebral body were performed. Rupture of the posterior longitudinal ligament was not observed where the mass compressed the spinal cord. Incision of the ligament revealed an anterior epidural mass which had the macroscopic appearance of herniated disk material. The lesion was completely removed and an autogenous bone graft was performed to restore the anatomy.

Histological examination of the mass revealed fragments of fibrocartilage with hyaline degeneration and calcification (Fig. 4). The patient improved but demonstrated

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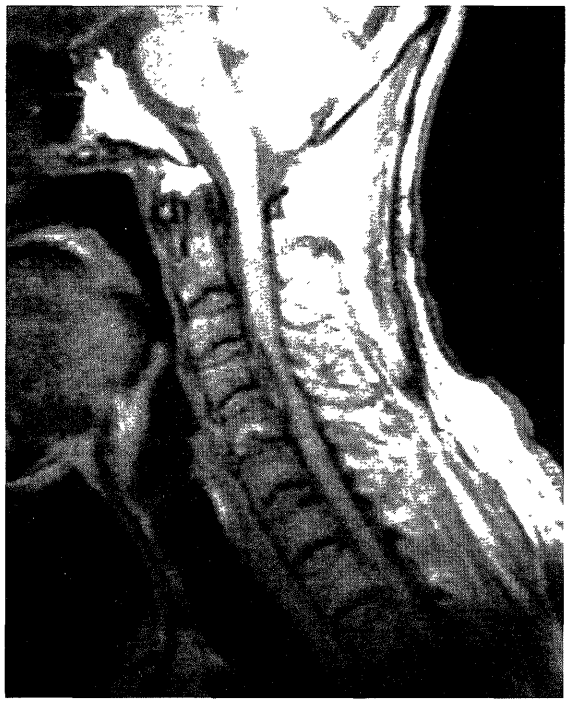
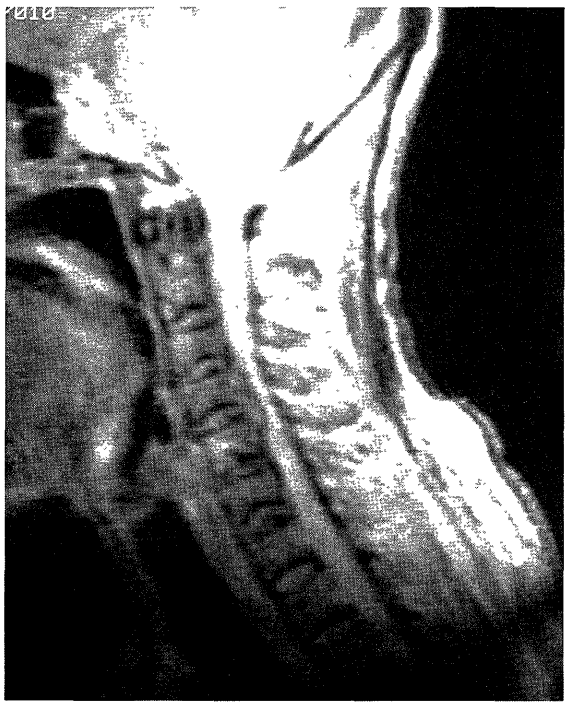
mild residual motor and sensory deficits several months after surgery.



(A)



(B)

Figure 2A, B Sagittal MRI demonstrates a slightly high intensity extradural mass at the level of C4 and C5 on both T1-weighted (500/30) and T2-weighted (2000/80) images.

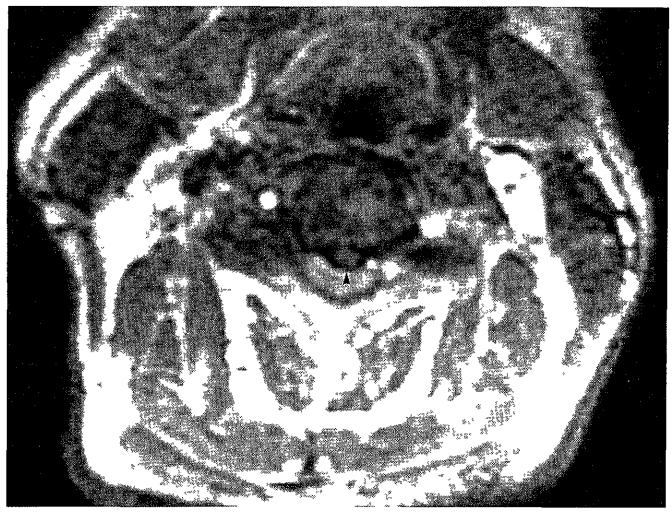


Figure 2C Axial MRI at the C3-C4 level shows a low intensity rim (arrowhead) at the periphery of the mass.

Figure 3 Ring-like calcification at the mass is clearly demonstrated on axial CT at the C4 level.

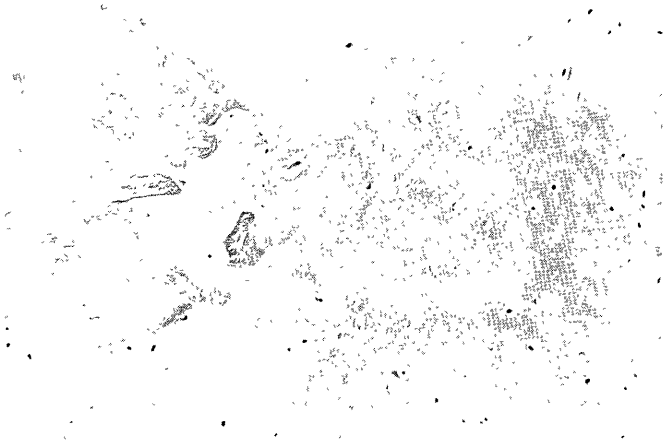


Figure 4 Photomicrograph of the mass shows fibrocartilage with hyaline degeneration and calcification.

Discussion

Disk herniation in the cervical spine is not infrequent, although less common than in the lumber spine. Herniated disk fragments can migrate freely in the epidural space with or without rupture of the posterior longitudinal ligament [1,2]. Disk sequestrations migrating to the lateral aspect of the spinal canal produce symptoms of nerve root compression. In rare cases, disk fragments migrating to the anterior or posterior surface of the spinal canal may cause myelopathy [1]. In the present case, it was thought that a free disk fragment migrated superiorly away from the disk of origin, although rupture of the posterior longitudinal ligament at the C5-C6 level was not confirmed during the operation. The presence of calcification seemed to represent that the sequestrated disk existed many years before discovery.

In adults, degenerative calcification of the intervertebral disks is a relatively common finding, especially in the thoracic spine [3,4]. Calcified thoracic intervertebral disks are often associated with continuous calcified disk herniation [5]. Therefore, calcified herniated disk material in the spinal canal is found in a higher percentage of thoracic than lumber or cervical disks. On the other hand, sequestrated disk herniation with calcification in the cervical spine is rare, although its exact frequency is unknown. In our case, no calcified intervertebral disks were found and the herniated disk fragment was not continuous with the intervertebral disks. These features made the correct diagnosis before surgery difficult. However, disk herniation is a common disorder, and should always be considered in the differential diagnosis even when radiologic findings reveal less common abnormalities such as calcification.

A wide variety of lesions are recognized as causes of extradural mass which may occasionally mimic sequestrated disk herniation. On MRI, the differential diagnosis in our case would include epidural hematoma, ossification of the posterior longitudinal ligament (OPLL), and extradural tumor. The possibility of an epidural hematoma was the major concern in our case, since the neurological symptoms appeared after trauma. However, the confirmation of calcification within the mass by CT made it unlikely that it was an epidural hematoma. OPLL, seen most commonly in the cervical spine, usually demonstrates homogeneous low signal intensity on both T1 and T2 weighted images. Occasionally, ossification with associated marrow formation can demonstrate high signal intensity within the mass similar to the findings in our case. However, the diagnosis of OPLL is established by plain radiographs or CT as a dense, ossified band posterior to the vertebral bodies and intervertebral disks. MRI is not always sufficient to distinguish disk sequestration from epidural neoplasm, even when Gd-DTPA enhancement is performed.

Generally, MRI in combination with plain radiography can provide the best information for evaluating cervical spondylosis and herniated disk disease [6-8]. The application of radiography is useful in the assessment of the osseous elements of the spine and calcification. MRI is useful in the detection of disk herniation including sequestrated disk fragments and in evaluating its relationship to the spinal cord. However, calcification and osseous change of the spine may be difficult to detect with MRI and plain radiographs alone [4]. CT is beneficial in detecting calcification and separating hypertrophic bony change from soft disk herniation [4,9,10]. In the present case, CT confirmed that the low intensity rim of the mass on MRI corresponded to calcification and was not hemosiderin associated with hematoma. We, therefore, emphasize that CT has an important role as a supplementary examination tool in the diagnosis of cervical disk herniation to provide information not clearly defined on MRI and plain radiography.

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