

Case Report

Chronic Spinal Epidural Hematoma Related to Kummell's Disease

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Chronic spinal epidural hematoma related to Kummell's disease is extremely rare. An 82-year-old woman who had been managed conservatively for seven weeks with the diagnosis of a multi-level osteoporotic compression fracture was transferred to our institute. Lumbar spine magnetic resonance images revealed vertebral body collapse with the formation of a cavitory lesion at L1, and a chronic spinal epidural hematoma extending from L1 to L3. Because of intractable back pain, a percutaneous vertebroplasty was performed. The pain improved dramatically and follow-up magnetic resonance imaging obtained three days after the procedure showed a nearly complete resolution of the hematoma. Here, we present the rare case of a chronic spinal epidural hematoma associated with Kummell's disease and discuss the possible mechanism.

Key Words : Spinal epidural hematoma · Kummell's disease · Percutaneous vertebroplasty.

INTRODUCTION

Although it is uncommon, a spinal epidural hematoma (SEH) is a well known condition that is surgically removed to improve the neurological status of a patient. It can occur from either traumatic or atraumatic etiologies with a variety of underlying predisposing conditions^{3,4}. However, chronic SEH related to Kummell's disease is extremely rare. To date, there has been only one case of chronic SEH related to Kummell's disease¹⁰. Kummell's disease is a type of pseudoarthritis that gradually develops from osteoporotic compression fractures. Due to the chronic course of Kummell's disease, it is not a likely cause of SEH; this is because it is not an acute compression fracture. Here, a rare case of a chronic spinal epidural hematoma in a patient with Kummell's disease is reported with a review of literature.

CASE REPORT

An 82-year-old woman complained of severe back pain after a slight fall seven weeks earlier. She was transferred from a traditional oriental hospital to the emergency room of our hospital. Here, the patient was managed conservatively for multi-level

osteoporotic compression fractures. Because of the persistent and incapacitating back pain as well as difficult sitting, she was transferred to our institute. The patient reported no history of heart disease, cerebrovascular disease, hypertension, or any recent trauma. She also denied any invasive procedures including chiropractic manipulation. The physical examination revealed marked tenderness at the L1 level and increased pain especially during flexion and extension. The patient reported relief of the pain only when lying still in bed. The findings on the neurological examinations were within normal limits. The laboratory findings including coagulation tests were also within normal limits. The plain X-rays demonstrated multiple compression fractures. Computed tomographic scans showed intravertebral gas at the L1 level. Magnetic resonance imaging (MRI) of the thoracolumbar spine revealed collapse of the vertebral body with formation of a fluid filled cavitory lesion at the L1 level and a spinal extradural hematoma extending from L1 to L3, ventral to the spinal cord (Fig. 1). The hematoma was identified by isointense signals of the spinal cord with a thin hyperintense signal at the peripheral rim on the T1-weighted images, and mixed signal intensity on the T2-weighted images. The patient had severe osteoporosis with a T-score on the bone marrow densitometry of -4.60. Because of the intractable pain unrelieved by conservative treatment, a percutaneous vertebroplasty was performed. About 5.7 cc polymethylmethacrylate was carefully injected into the vacuum space of the vertebral body. After the procedure, immediate pain relief was achieved and the patient could ambulate independently wearing a brace. Postoper-

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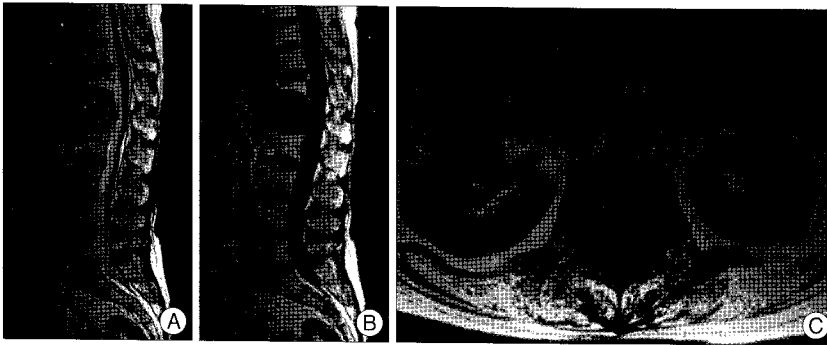


Fig. 1. Magnetic resonance images of the patient with chronic spinal epidural hematoma related to Kummell's disease. A : T2- weighted sagittal image reveals a mixed signal intensity epidural lesion in the ventral aspect of the spinal canal extending from L1 to L3 level. B and C : T1- weighed sagittal and axial images reveal the hematoma showing isointense to the spinal cord at the ventral part of the spinal canal.

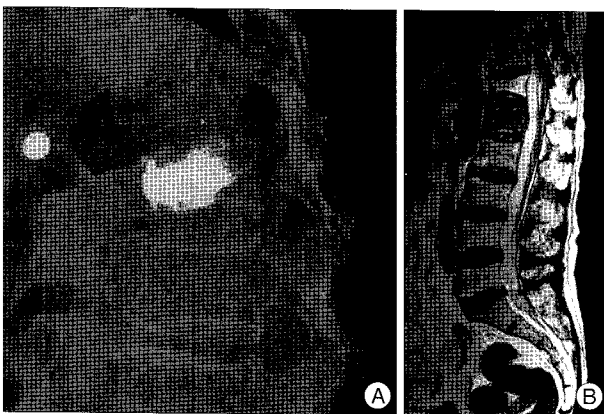


Fig. 2. Simple lateral radiograph and magnetic resonance image after percutaneous vertebroplasty. A : Simple lateral radiograph of the spine obtained after percutaneous vertebroplasty shows effective cement filling of cystic fracture cavity. B : T2-weighted sagittal magnetic resonance image reveals nearly complete resolution of hematoma at 3 days after percutaneous vertebroplasty.

ative standard radiographs showed that the bone cement was well localized in the cystic cavity at the T12 vertebral body (Fig. 2A). Three days after the procedure, the follow up MRI revealed a nearly complete resolution of the hematoma (Fig. 2B).

DISCUSSION

A spinal epidural hematoma is a well known, though uncommon, condition associated with spinal fractures and invasive intraspinal procedures such as epidural anesthesia and it can occur spontaneously⁹⁾. A spontaneous SEH can occur by the following mechanism: local pooling within the valves of thin walled epidural veins, and brief increases in intravenous pressure due to raised intrathoracic and intraabdominal pressure may lead to their rupture²⁾.

Kummell's disease is a spinal disorder characterized as delayed post-traumatic collapse of vertebral body. Generally, it is thought to be a pseudoarthrosis, and intravertebral clefts represent fracture nonunion with dynamic mobility. The presence of a vacuum cleft within the vertebral fracture represents focal

bone ischemia associated with non-healing vertebral collapse and it is indicative of bone changes with position or respiration¹¹⁾. SEH usually results from osteoporotic compression fractures, however, there are rare reports associated with Kummell's disease. In fact, Kummell's disease is not thought to cause SEH because it is not diagnosed during the acute phase of compression fractures⁶⁾. However, in this case, Kummell's disease was likely responsible for the development of SEH. The pathophysiology seemed neither traumatic nor spontaneous. Kerlake et al.⁷⁾ reported that a SEH resulting from spinal trauma is usually resolved within three weeks in most cases. The current case presented with an epidural hematoma seven weeks after the injury. This is based on a connection between the intravertebral cleft and epidural space. The integrity of the posterior cortex is an important consideration for the development of a SEH. The defect of posterior cortex may increase the chance of a SEH under weight bearing by nonunion with dynamic mobility. Oda et al.¹⁰⁾ suggested the possibility that the fluid including the hemorrhage inside of the intravertebral cleft may be under pressure, and be pushed out into the epidural space during daily motion, and cause a subacute or chronic SEH.

MRI is considered the initial diagnostic imaging method for a SEH. The variability of the signal intensity can make the diagnosis difficult, but this phenomenon can also be helpful in determining the phase of the hematoma. In the acute phase, the hematoma appears isointense when compared with the spinal cord on T1-weighted images, and hyperintense on T2-weighted images. In the subacute stage, hematomas show characteristic high signal intensity on T1-weighted images, whereas they tend to be slightly hypointense or hyperintense on T2-weighted images. In the chronic stage, hematomas appear hyperintense on both T1- and T2-weighted images¹⁾.

The prognosis of SEH appears to be related to the severity of the preoperative neurological deficits and the time to intervention; early surgical treatment is crucial for good outcomes⁸⁾. For this reason, urgent decompression is the treatment of choice for SEH⁵⁾. However, in the case of a neurologically intact patient with SEH related to Kummell's disease, vertebroplasty alone may be effective treatment for the hematoma. A cleft or cavity completely filled with bone cement can block the connection between the intravertebral cleft and epidural space and aid in the spontaneous resolution of the hematoma over time.

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CONCLUSION

This case illustrates an uncommon case of SEH in a patient with Kummell's disease. Although rare, the possibility of chronic

SEH should be kept in mind in patients with Kummell's disease.

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