CASE REPORT

Spontaneous spinal epidural hematoma: Early surgical intervention provides ideal neurological outcome

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Summary Spontaneous spinal epidural hematoma (SSEH) is an unusual cause of spinal cord compression, requiring emergency diagnosis and treatment. We report a case of SSEH, and discuss its early diagnosis and rapid surgical intervention. A 46-year-old man was brought to our emergency department because of sudden-onset, rapidly-progressive paraplegia and acute urinary retention. Magnetic resonance imaging revealed an epidural mass lesion in the posterior epidural space from T9 to T11 in the spinal canal. The patient underwent emergency decompression laminectomy within 4 hours of symptom onset and recovered fully within 1 week. In patients with SSEH, early surgery is crucial to ensure a favorable outcome. Copyright © 2014, Taiwan Surgical Association. Published by Elsevier Taiwan LLC. All rights reserved.

1. Introduction

Spontaneous spinal epidural hematoma (SSEH) is traditionally considered a relatively rare cause of spinal cord compression, with a reported incidence of approximately 1 patient per 1,000,000 people in 1996. However, SSEH is becoming increasingly common, with two cases reported in 1986 and seven in 1997. This increasing trend might be...
attributable to the increased use of spinal magnetic resonance imaging (MRI) as a diagnostic tool.

SSEH is more common in men than in women (1.5:1), and most commonly affects patients aged between 50 years and 80 years.2 The etiology of SSEH remains unknown; however, predisposing factors are considered to include vascular anomaly, coagulopathy, and arterial hypertension.3 Rapid decompressive surgery is strictly indicated in all cases in which the neurological deficit is serious or symptoms demonstrate rapid worsening. Time to diagnosis and surgery can play a major role in reducing morbidity. Rapid diagnosis often leads to a full recovery with no residual neurological deficits.

2. Case Report

A 46-year-old man presenting with severe lower back pain was brought to the emergency department of the study hospital. The onset of his pain was a few hours previously, with no trauma or fall reported. Rapid exacerbation of symptoms ensued, resulting in complete paralysis of the lower leg muscles (0/5 Frankel bilaterally). The patient also experienced acute urine retention.

Physical examination revealed normal response in the patient’s upper limbs and normal vital signs. Blood test results indicated no abnormalities; however, spinal MRI revealed an epidural mass lesion (10 mm × 12 mm × 63 mm) in the posterior epidural space from T9 to T11 in the spinal canal. Heterogeneous high signals on T2 weighted imaging and T1 weighted imaging indicated a hematoma (Fig. 1). Although no obvious enhancement was noted, a significant mass effect on the T11 cord was observed. Disc spaces and bone marrow signal intensities displayed minimal change. Preoperative somatosensory evoked potentials tests indicated reduced waveform velocity and size. Postoperatively, the waveforms recovered.

The patient underwent surgery approximately 3 hours after admission and diagnosis. An emergency decompression laminectomy was performed between T9 and T11, revealing a dark reddish hematoma attached to the dura.

Figure 1  T2-weighted sagittal magnetic resonance imaging of the cervicothoracic spine, showing the spinal cord from T9 to T11 being compressed with a posterior epidural mass lesion: (A) sagittal view; (B) transverse view.

Figure 2  T2-weighted sagittal magnetic resonance imaging after laminectomy and removal of the hematoma: (A) sagittal view; (B) transverse view.
No dural arteriovenous malformation was visible in the area of decompression. The patient fully recovered within 1 week of the operation and was discharged on Day 10 postoperatively. At the time, no residual neurological deficits were detectable, and symptoms of leg numbness and lower back pain had subsided. Fig. 2 shows the results from postoperative follow-up spinal MRI analysis. At 3 months and 6 months postoperatively, the patient experienced no residual effects from the hematoma. The rapid diagnosis and treatment of the SSEH resulted in a favorable surgical outcome.

3. Discussion

Our patient presented with severe pain in the lower back, lower limb paralysis, and acute urine retention. He had no history of trauma, anticoagulation, or iatrogenic maneuvering. Blood test results indicated a normal coagulation profile. MRI confirmed the diagnosis of SSEH and the patient underwent surgery immediately. The rapid diagnosis and treatment of the SSEH enabled complete recovery of neurological function.

SSEH is a collection of blood of generally unknown origin in the epidural space, and accounts for 40% of all spinal epidural hematomas. The valveless epidural venous plexus is considered the origin of bleeding, and the cause of rupture in the venous plexus is presumed to be fluctuation in intrathoracic or intraabdominal pressure.

In adults, the most common localization of SSEH is the cervicothoracic or thoracolumbar junction. The common clinical syndrome includes sudden-onset neck or back pain, dermatomal radiculopathy, urinary dysfunction, and progressive paraplegia. Back pain can be associated with symptoms of spinal cord compression including numbness, progressive paraplegia, loss of leg sensory function, and cauda equina syndrome. Misdiagnosis is often caused by unusual presentations, such as cerebrovascular accident or transverse myelitis.

The outcome of surgical decompression is dependent on the duration between the onset of symptoms to operation; therefore, excess time consumed by imaging analysis can result in an unfavorable surgical outcome. Lumbar myelography and computed tomography scanning are nonspecific for SSEH, and might not precisely indicate the extent of the hematoma. Spinal MRI has gradually replaced standard diagnostic methods for an SSEH because it is noninvasive and precise, and can determine the position and extent of the hematoma. MRI should thus be considered the standard tool for the diagnosis and preoperative evaluation of SSEH.

Previous case reports and clinical studies have demonstrated that early management of SSEH leads to a favorable neurological outcome. In a meta-analysis of 613 patients, Kreppel et al. observed that patients who underwent surgery within 12 hours of diagnosis were associated with the highest rate of recovery of complete sensorimotor function. We treated our patient by using surgical decompression laminectomy within 4 hours of pain development. We confirmed the diagnosis of SSEH by using MRI, and performed emergency surgery to relieve spinal cord compression because of rapid deterioration of neurological function. The early diagnosis of SSEH is crucial for prognosis. Long periods of compression are typically associated with the reduced likelihood of neurological recovery, because mechanical compression leads to ischemia and secondary neuroinflammation.

Unlike traumatic spinal epidural hematoma, SSEH does not damage adjacent structures such as bones, or soft tissues, such as ligaments. The spinal cord is also unlikely to demonstrate signs of contusion. The rapid removal of a blood clot causing compression can lead to a favorable prognosis, even in patients presenting with lower limb paralysis and acute urine retention.

SSEH is typically associated with a more favorable prognosis than is spontaneous spinal subdural hematoma, which can be caused by the use of anticoagulants or pre-existing vascular lesions. The excision of a vascular lesion can cause ischemia, resulting in a less favorable surgical outcome than for SSEH.

In conclusion, when a patient experiences sudden-onset back pain and rapidly progressive neurological sensorimotor dysfunction, an emergency clinician should consider the possibility of SSEH and perform MRI as early as possible to confirm or eliminate a diagnosis of SSEH. Surgical timing is vital for a favorable prognosis; therefore, the diagnosis should be confirmed early, after which the patient should undergo surgery immediately. The most reliable and accurate diagnostic tool for an SSEH is spinal MRI. Early surgery is the crucial factor to achieve a favorable outcome.

References


