Spontaneous Cervical Spinal Epidural Hematoma: A Case Report

Sai-Cheung Lee, Tai-Ngar Lui, and Shih-Tseng Lee

Abstract- Spontaneous cervical epidural hematoma is an uncommon cause of acute spinal cord compression. It usually occurs with sudden cervical or interscapular pain. Typically, increasing compression of the spinal cord leads to paralysis within minutes to hours after the onset of symptoms. The authors report a case of spontaneous cervical epidural hematoma with sudden onset of left side complete hemiplegia without neck pain. Cervical spinal image studies revealed acute spinal epidural hematoma with spinal cord compression, therefore, emergency surgical removal of the epidural hematoma was performed. The patient recovered well during the 6 months follow-up period. Acute spinal epidural hematoma is definitely a condition of neurological emergency, and although rare, it must be considered in non-traumatic patients with sudden onset of neurological deficits. The absence of neck pain still cannot rule out the possibility of acute cervical epidural hematoma. Early diagnosis made by image studies is mandatory, and emergency surgical evacuation of the epidural hematoma maximizes the chance of neurological recovery

Key Words: Cervical spinal epidural hematoma, Spontaneous, Spinal cord compression, MRI

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INTRODUCTION

Spinal epidural hematoma is a rare entity. It has been associated with trauma, coagulopathy, anti-coagulant treatment, infection, tumor, arteriovenous malformation and post-operative complications[1]. The term 'spontaneous' has been defined here as "no identified etiology". The onset of symptoms/signs of spontaneous cervical epidural hematoma (SCEDH) is usually abrupt and rapid. The classic clinical picture is that of acute onset of severe, often radiating, neck pain followed by signs and symptoms of a rapidly evolving nerve root and/or spinal cord compression, the latter depending on the site of bleeding[2]. We report a case of SCEDH presented with sudden onset of hemiplegia without neck pain, and was successfully treated surgically. This emphasizes the importance of rapid and correct diagnosis followed by early surgery.

CASE REPORT

This 61 years old female patient was sent to our emergency room (ER) with a chief complaint of sudden onset of left side hemiplegia when she woke up one hour before her arrival. She reported that she slept on a sofa chair with a lying posture and neck flexion for about an

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hour. Before she fell asleep, she was sitting on the same sofa chair watching television for about two hours and denied any exertional history. The patient's medical history revealed that she had had hypertension for two years and she was under regular medical control. No recent trauma history was noted.

On presentation to the ER, the patient complained of bilateral shoulder soreness but neither neck pain nor neck stiffness. On neurological examination, the patient was clear and alert. Complete hemiplegia was found in the left side with a muscle power of Gr0/GrV. Muscle power of the right limbs was normal. Tendon reflexes were absent in the left limbs and slightly hyperactive in the right side. Plantar responses were flexor. There is no muscle atrophy of the extremities. Urine retention was present. Cranial nerves and cerebellar functions were intact. Paraesthesia and decreased sensation to pinprick, light touch, and vibration sensations were noted bilaterally, below the level of T4 dermatome. Other physical examinations were normal. The hematological data, including platelet count and function of the coagulation cascades, were normal. Since a cervical spinal pathology was suspected cervical spinal x-ray and MRI was performed. Cervical spinal MRI showed an isointense, mass situated on the left side dorsolaterally, extending from C2 to C5 on T1-weighted images (Fig. 1), but no enhancement was observed after gadolinium injection. The T2-weighted images displayed a heterogenous signal within the lesion (Fig. 2). An additional axial computed tomographic scan of the cervical spine revealed, compatible with the findings on the cervical spinal MRI, a left dorsolateral hyperdense biconvex lentiform mass extending from C2 to C5, with compression of the myelon (Fig. 3). The final radiological diagnosis was spinal epidural hematoma with compression of the spinal cord. Cervical laminectomy from C2 through C5 was performed 6 hours after the onset of the symptoms. Beneath the ligamentum flavum, liquid blood with solid clots was found and evacuated. The dura resumed its normal position and showed good respiratory pulsations. No discrete bleeding point was identified, and hemostasis was achieved without difficulty. Neither tumor nor abnormal vessels were found in the epidural space. Pathology examination of the blood clots revealed fibrin deposition

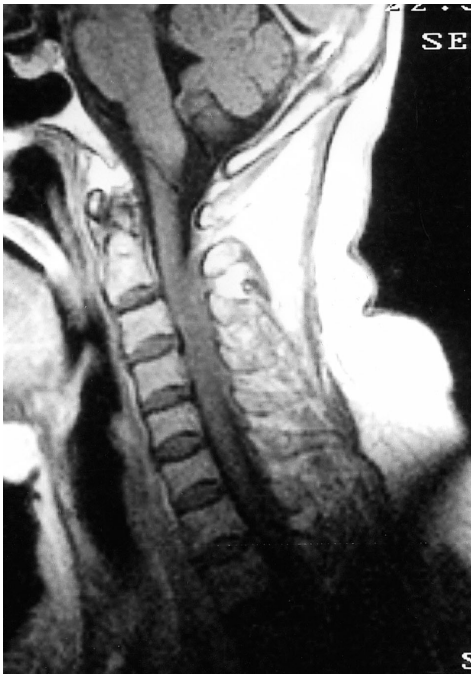

Figure 1. The T1-weighted images showed an isointense, dorsolaterally situated mass on the left side extending from C2 to C5.

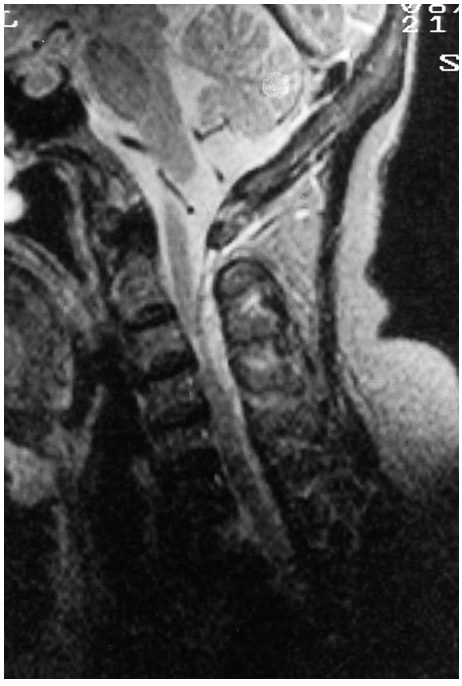

Figure 2. The T2-weighted images displayed a heterogenous signal within the lesion.

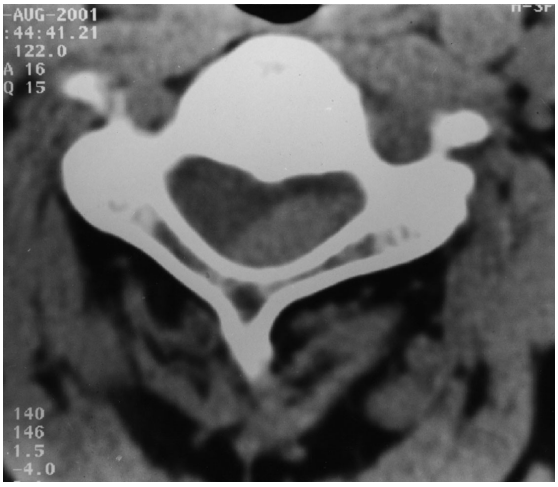

Figure 3. Axial computed tomographic scan of the cervical spine revealed a left dorsolateral hyperdense epidural mass with compression of the spinal cord.

and leukocytes entrapped and no evidence of malignancy. The left limb weakness was markedly improved immediately after the operation, from Gr 0/V pre-operatively to Gr III/IV at the seventh day post-operatively. Good recovery of bladder function also noted. The patient was discharged without complications seven days later, and fitting with a Philadelphia neck collar. She was transferred to the rehabilitation unit for further physical and occupational therapies. During the 6-months, follow-up period at our out-patient clinic, the patient recovered progressively with only mild spastic paresis in her left upper extremity.

DISCUSSION

The clinical features of SCEDH can resemble those of an acutely ruptured cervical disc, epidural neoplasia, transverse myelitis, dissecting aortic aneurysm, congenital cysts, spondylitis, or infection such as an epidural abscess[3]. However, as seen in this case, SCEDH may be presented as hemiparesis or hemiplegia without neck pain. Rapid and correct diagnosis of spinal epidural hematoma is based on a high degree of clinical suspicion; and image findings can differentiate among the various potential causes of neurological deterioration. This patient denied having any trauma history but only neck flexion posture for an hour during sleep prior to the sudden onset of hemiplegia. No neck pain was reported. Without performing a thorough neurological examination immediately, sudden onset of hemiplegia without any complaint of the neck may sometimes lead to an impression of cerebral vascular problem. This would lead to a series of unnecessary studies of the brain and delay the diagnosis of cervical epidural hematoma, and subsequently delay surgical removal of the hematoma.

Several cases of SCEDH successfully treated by conservative treatment have been reported[4,5]. All of them were only with moderate neurological symptoms at examination and rapid improvement. In fact, most of the authors favor early surgical treatment. It is suggested that the improvement of neurological function correlates inversely with the time interval from symptom onset to surgery and the duration of maximum deficits, which both reflect the duration of spinal cord compression. In view of the fact that symptoms and signs may be separated from each other by several hours, it is important to maintain a high index of suspicion for SCEDH, as early surgical intervention usually results in good recovery of cord function[2,6,7]. Even patients with complete motor and sensory deficits can be improved with surgery[2].

The CT appearance of spinal epidural hematoma depends on its age. The appearance of an epidural hematoma in the acute stage has a characteristic convex surface, hyperdense appearance on CT scans but is nonspecific and may be difficult to distinguish from an epidural abscess or tumor without administration of contrast medium. In the hyperacute stage, the spinal epidural hematoma may appear as isosignal intensity on T1-weighted MRI images and as isosignal intensity to mild hypersignal intensity on T2-weighted images as a result of the presence of intracellular oxyhemoglobin, although in practice, this stage is not commonly observed[8,9]. The usual finding in the first 24 hours is the appearance of the hematoma as an area of predominantly T2-weighted hyperintensity in combination with focal areas of T2 weighted hypointensity (caused by the presence of intracellular deoxyhemoglobin), and isointensity on T1-weighted images. A hematoma at least 4 days old may be isodense on CT scans, and, in such a case, much more apparent on magnetic resonance images. MRI is superior to computed tomography in detecting a hematoma, par-

ticularly in its "isodense" stage; and superior at all times in demonstrating its relationship to the spinal cord[10]. MRI performed after a few days (early subacute hematom) would show the lesion as an area of T1-weighted hyperintensity and as T2-weighted hypointensity as a result of the presence of intracellular methemoglobin.

Summarizing the different causes mentioned in literatures, the possible ruptures of epidural veins, arteries, cryptic angiomas, vascular malformations or hemangiomas and spinal angiomas are advocated, but none of the authors managed to give (strong) supportive arguments for their theories, nor statistically neither on anatomical basis[1]. Our case did not have any predisposing factor but a flexion posture for one hour prior to the onset of hemiplegia. However, neurological deficit caused by SCEDH are usually rapid. Hemorrhage from an epidural vein can rarely compress the dura sac. By the common observation encountered during surgical procedures, the normally expanded dural sac may tamponade epidural venous bleeding. It is reasonable to assume that the bleeding source to cause a SCEDH is from an artery, or a relatively high blood pressure vessel such as a very small AVM or a cryptic angioma that is difficult to be observed during the surgical removal of the hematoma. Direct observation of the bleeding site intra-operatively or document by a spinal angiography is extremely difficult. Cervical spinal angiography should not be a routine examination in spontaneous cervical spinal EDH unless tortuous abnormal vessels are seen in the CT scan or MRI.

In most circumstances, a cervical CT scan or MRI is sufficient to demonstrate an acute cervical spinal EDH and provide adequate information for the location and spinal level. A correct and rapid diagnosis of spontaneous cervical spinal epidural hematoma followed by emergency surgical removal of the hematoma is the keystone for good recovery.

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