Idiopathic cervical spinal subdural haematoma: a case report and literature review

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Abstract
This report describes a case of idiopathic cervical spinal subdural haematoma (SSDH) in which the haematoma was spontaneously absorbed without any treatment. A 68-year-old male patient presented with persistent neck pain and no obvious cause. Magnetic resonance imaging (MRI) revealed a space-occupying lesion at the C4–T1 levels. The lesion was initially misdiagnosed as a tumour. An operation was arranged to remove the tumour, but a preoperative computed tomography scan showed no obvious abnormal soft tissue density in the cervical spinal canal. Repeat enhanced MRI showed degeneration of the cervical vertebrae, but no obvious abnormal soft tissue density and no obvious enhanced signals in the cervical spinal canal. Spontaneous resolution of an idiopathic cervical SSDH was considered. Idiopathic cervical SSDH without obvious neurological symptoms are difficult to diagnose, so suspected cases should be carefully monitored. If the neurological symptoms grow progressively more debilitating with time, emergency surgery might need to be considered. To avoid unnecessary surgery, conservative management should be an option for patients with minimal neurological deficits and re-examination with MRI could be the best way to observe the dynamic changes taking place in the idiopathic cervical SSDH.

Keywords
Idiopathic, spinal subdural haematomas, neck pain

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Introduction

Spinal subdural haematomas (SSDH) are rare.¹ The aetiology of SSDH includes anticoagulant therapy, spinal tap, acupuncture, arteriovenous malformation and coagulation disorders.¹–⁵ The identification of SSDH has improved with the availability of several imaging and symptom studies.¹,⁶ Most patients with SSDH present with radicular pain and motor, sensory or autonomic dysfunction.¹,⁷ Magnetic resonance imaging (MRI) provides a relatively definitive diagnosis.⁶,⁸ T1- and T2-weighted MRI images are considered adequate and reliable for the diagnosis of SSDH.⁹,¹⁰ In some cases, no specific factors were identified.¹¹ This current case is also unique because few cases have reported idiopathic SSDH that is only observed in the cervical region.¹¹,¹² This case report describes a patient with idiopathic cervical SSDH with neck pain. The haematoma was spontaneously absorbed completely without any treatment within 1 week.

Case report

In May 2017, a 68-year-old male patient presented at the outpatient department of Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, Hubei Province, China with neck pain that had lasted 5 days without any obvious inducing factors. There was no history of anticoagulation and antiplatelet medication use including aspirin, warfarin and dicoumarol, trauma, local invasive operations or coagulation defects. He had not performed any strenuous exercise or work involving heavy-weight lifting. He had experienced hypertension for 3 years, but there was no evidence of other comorbidities, such as cardiovascular diseases, cerebrovascular diseases and haematological system diseases. On examination, his blood pressure was 134/91 mmHg and the physical examinations were normal. The sensation in the extremities and torso, and the myodynamia extremities (strength: 5/5 in all extremities) were normal, and the sphincter function was normal as well. The myelopathy signs evaluated included clonus (−), neck spasticity (−), hyperreflexia (−), inverted supinator reflex (−), bilateral Hoffmann sign (−) and bilateral Babinski sign (−).

Magnetic resonance imaging of the cervical vertebrae was performed at Hubei Cerebrovascular Disease Hospital, Xiantao, Hubei Province, China 5 days prior to arriving at Union Hospital. On analysing the MRI images, slightly long T1- and T2-weighted abnormal streak signals were identified in the subdural space, extending from C4 to T1 in the left rear of the spinal cord and compressing the spinal cord (Figure 1). The imaging findings suggested the presence of a space-occupying lesion at the level of C4 to T1. Therefore, a provisional diagnosis of a spinal subdural tumour was made.

Subsequently, the patient was admitted the outpatient department of Union Hospital on 20 May 2017 and routine preoperative examinations were performed. Arrangements were made to perform a surgical procedure to remove the tumour. His routine blood parameters, hepatorenal function, electrolyte and coagulation function were all normal. The blood platelet count was 273 g/l. The coagulation function analysis was as follows: prothrombin time, 12.5 s; international normalized ratio, 0.95; activated partial thromboplastin time, 34.4 s; fibrinogen level, 3.81 g/l; thrombin time, 17.5 s. Cervical spine posterior-anterior and lateral X-ray images showed degeneration of the cervical vertebrae. On the second day after admission, computed tomography (CT) images showed a thickening of the ligamentum flavum at the C4–C6 levels and degeneration of the cervical vertebrae (Figure 2). There was no obvious abnormal soft tissue density in the cervical
Figure 1. Magnetic resonance images of a 68-year-old male patient who presented with neck pain that had lasted 5 days without any inducing factors. The images show a space-occupying lesion at the C4–T1 levels (a and b). The arrows show a slightly long T1- and T2-weighted abnormal streak signal in the subdural space, which extended from C4 to T1 in the left rear of the spinal cord and compressed the spinal cord. The colour version of this figure is available at: http://imr.sagepub.com.

Figure 2. Repeat computed tomography images of a 68-year-old male patient who presented with neck pain that had lasted 5 days without any inducing factors. The images show thickening of the ligamentum flavum at the C4–C6 levels (a and b) and degeneration of the cervical vertebrae. No obvious abnormal soft tissue density was observed in the cervical spinal canal.
spinal canal. On the fifth day after admission, a repeat gadolinium-enhanced MRI scan showed degeneration of the cervical vertebrae; and no obvious abnormal soft tissue density and no obvious enhanced signals in the cervical spinal canal were observed (Figure 3). At the same time, the neck pain had improved. Therefore, the provisional diagnosis was revised to an idiopathic SSDH. Imaging-inconsistent SSDH was confirmed and spontaneous resolution of the idiopathic cervical SSDH was considered. Finally, the neck pain disappeared gradually without any treatment. There was no recurrence of symptoms after follow-up for 1 year.

This study was approved by the Institutional Review Board of Union

Figure 3. Enhanced magnetic resonance images of a 68-year-old male patient who presented with neck pain that had lasted 5 days without any inducing factors. The images show degeneration of the cervical vertebrae (a and b). There was no obvious abnormal soft tissue density and no obvious enhanced signal was observed in the cervical spinal canal (c and d). Contrast enhanced with gadolinium.
Hospital (no. 2017S214). All procedures in this retrospective study were undertaken in accordance with the ethical standards of the Institutional Review Board of Union Hospital and with the Declaration of Helsinki. Written informed consent was obtained from the patient.

**Discussion**

The thoracic spine is the most common location of SSDH. The aetiology of SSDH includes the use of coumarins or other haemostatic agents, coagulation disorders, structural malformations and the presence of no underlying pathological conditions. SSDH at the cervical or cervicothoracic levels are relatively rare. Several cases of cervical or cervicothoracic SSDH have been reported. Among them, only a few cases with obvious neurological symptoms and accurate diagnoses experienced the spontaneous resolution of the haematoma. However, a few cases reported idiopathic SSDH without underlying pathological conditions located only in the cervical region.

Previous published cases of idiopathic cervical or cervicothoracic SSDH without potential causative risks are reviewed and compared in Table 1. As observed with the current case, neck pain was the most common symptom and neurological dysfunction was relatively mild. The potential causative risks were unknown and conservative treatment was the preferred option.

In the current case, the spinal cord was clearly compressed as observed on the MRI images. In addition, non-acute neck pain and the absence of motor, sensory or transient dysfunction led to the misdiagnosis of the condition as a spinal subdural tumour. A previous case report had suggested the spontaneous resolution of idiopathic cervical SSDH presenting with acute hemiparesis. However, to date, no study has reported that idiopathic cervical SSDH presenting with non-acute neck pain can spontaneously be absorbed within only 1 week.

Although both MRI and CT scans can be used as complementary investigative tools providing the characteristic findings that are needed to establish the diagnosis of SSDH, MRI best depicts the location and the extent of the haemorrhage. However, in the current case, the re-examination of CT and MRI images did not show any sign of SSDH. Hence, the haematoma had completely resolved spontaneously. A previous case report stated that the redistribution of the haematoma to the spinal subdural space was a mechanism for the rapid spontaneous resolution of posttraumatic acute subdural haematoma. In the current case, redistribution of the haematoma was regarded as the primary reason for the spontaneous resolution of the idiopathic cervical SSDH.

Emergency surgical decompression is considered the primary choice for SSDH with severe neurological symptoms. It had been reported that 72% of cases with SSDH underwent surgical intervention. Conservative management is an alternative therapeutic option for acute SSDH presenting with transient hemiplegia. However, in cases with spontaneous SSDH, the outcome was favourable in only 59% of cases. SSDH carries a mortality rate of approximately 1.3% and a morbidity rate of 28%. Prompt and accurate diagnosis and emergency surgical decompression are regarded as the important factors affecting the prognosis of SSDH. Moreover, in a few cases of cervical or cervicothoracic SSDH, the haematomas were spontaneously absorbed or recovered after the administration of conservative treatment such as methylprednisolone pulse therapy.

Idiopathic cervical SSDHs without obvious neurological symptoms are easy to misdiagnose as tumours or other diseases. Hence, the patient should be strictly and
Table 1. Previous case reports of idiopathic cervical spinal subdural haematoma.\(^{11,12,15,16,18–20}\)

| Author       | Year | Age, sex | Symptoms                              | Myelopathy signs                                    | Location | Potential risk | Treatment          | Prognosis          |
|--------------|------|----------|---------------------------------------|------------------------------------------------------|----------|----------------|---------------------|--------------------|
| Oh et al.\(^{12}\) | 2009 | 59, F    | Neck pain and motor weakness of left side | Motor weakness                                       | C3–C6    | Unknown        | Conservative        | Recovery           |
| Yang et al.\(^{15}\) | 2011 | 55, F    | Back pain                             | Paralysis of both lower extremities and hypoesthesia | C2–T6    | Unknown        | Conservative        | Recovery           |
|              |      | 38, M    | Chest and back pain                   | Hypoesthesia, hyperreflexia, sphincter dysfunction   | C6–T6    | Unknown        | Conservative        | Improvement        |
| Park et al.\(^{16}\) | 2012 | 48, F    | Neck pain and motor weakness          | Hypoesthesia and hemiparesis on right side           | C3–C5    | Unknown        | Conservative        | Recovery           |
| Panciani et al.\(^{18}\) | 2013 | 79, F    | Paraplegia and urinary retention      | Anaesthesia and sphincter dysfunction                | C5–T6    | Unknown        | Delayed hemilaminectomy | Improvement        |
| Chung et al.\(^{19}\) | 2014 | 66, F    | Headache and neck stiffness           | None                                                 | C7–T4    | Unknown        | Conservative        | Improvement        |
| Ma et al.\(^{20}\) | 2015 | 29, F    | Neck and shoulder pain                | Hyporeflexia Babinski and Chaddock signs (+)         | C6–T2    | Unknown        | Conservative        | Unknown about the prognosis of SSDH |
| Wang et al.\(^{11}\) | 2018 | 43, F    | Neck pain                             | Hyperreflexia of left leg                            | C2–C5    | Unknown        | Laminectomy         | Improvement        |

F, female; M, male; SSDH, spinal subdural haematoma.
closely monitored. Emergency surgical decompression is performed in most cases of SSDH.\textsuperscript{1,22} If the neurological symptoms grow progressively debilitating with time, emergency surgery needs to be considered. However, it has been reported that conservative treatment may be justified in the presence of mild neurological deficits or in patients with early progressive improvement and poor general conditions.\textsuperscript{17} However, due to the severe consequence of cervical SSDH, the exact decision should be made considering the neurological symptoms and the imaging findings.

In conclusion, to avoid unnecessary surgery, conservative management should be an option for patients with minimal neurological deficits associated with a cervical SSDH. Re-examination of the MRI could be the best way to observe the dynamic changes taking place in the idiopathic cervical SSDH.

Declaration of conflicting interest
The authors declare that there are no conflicts of interest.

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