Delayed myelopathy after stab injury with intraspinal non-metal foreign body granuloma

WU Qiong-hue*, CHEN Wei-shan 陈维善 and CHEN Qi-xin 陈其听

There are few reports on delayed neurologic deficit after stab injury with a retained intraspinal foreign body and granuloma formation. This study reported a 24-year-old man presented with progressive neurologic deficits, an unusual case of delayed myelopathy with an intraspinal nonmetal foreign body granuloma, which was misdiagnosed as tuberculosis of neural arches before operation because the patient almost forgot the event that he was stabbed in dorsal region 4 years ago.

CASE REPORT

The 24-year-old man presented with progressive pain of right lower limb for one year, numbness in both lower limbs and difficulty in walking for 3 months. Thoracic spinal magnetic resonance image showed a space occupying lesion in the spinal canal at T10-T11 and was misdiagnosed initially as intraspinal tumour. The pathologic examination by CT-guided biopsy showed inflammatory reaction. The patient had been treated conservatively with antibiotics, but the symptoms were not improved in 3 months. So the patient was admitted into hospital again.

The neurological examination revealed a hypesthesia below the umbilicus, a weakness of iliopsoas, quadriceps femoris and dorsiflexion (the muscle power was 3-4/5 on MRC scale). The knee reflexes were brisk, and Babinski’s sign was not elicited. Radiograph of thoracic spine showed no abnormality. CT scanning showed bone erosion of right neural arches at T10 and soft tissue lump intrusion of intervertebral foramen. The boundary of dura was vague. Preoperative MRI showed low signal of right neural arches and intervertebral foramen at the segments T10-T11, and high signal in spinal canal on the sagital T1WI. The lesion appeared low signal and the spinal cord at segments T9-T11 was oedema on the sagital T2WI (Fig.1). The diagnosis of imaging was tuberculosis of the right neural arches at the level of T10-T11. The patient did not report the history of stab injury in the dorsal region and he was consequently diagnosed as tuberculosis of the right neural arches at the level of T10-T11. After two week's antituberculous therapy, we planned to perform debridement of the tuberculous lesion and pedicle screw fixation.

A right hemilaminectomy and arthrectomy of facet joint of T10-T11 was performed. The bone of right pedicle and partial facet joint of T9 was eroded. After foraminotomy, a globular granuloma (diameter: 1.5 cm) with a dense capsule was found at intervertebral foramen and lateral spinal canal at the level of T10. The foreign body was observed in intervertebral foramen, partially extending into spinal canal and extracted cautiously and identified as bamboo stick. During the operation, we contacted with his family members and confirmed that the patient had been stabed in dorsal region by bamboo and recovered well 4 years before. There were totally 9 pieces of bamboo stick in spinal canal (Fig.2). The inflammatory granuloma adhered tightly to spinal dura mater, so it was difficult to disconnect and remove it completely. To avoid damage on spinal cord, only parts of the granuloma were removed. Pedicle screw fixation (T9-T12) were performed. The pathologic examination showed inflammatory granulation tissue, hyaline degeneration and fiber hyperplasia in H&E staining (Fig.3).

The patient’s postoperative recovery was uneventful. After antibiotic therapy and stitch removal on 14th day, he was discharged. Three months later, the patient was able to walk independently. Sensation in both lower limbs was recovered and the muscle power and knee reflexes was restored to normal. The MRI showed
minification of granuloma in the spinal canal on T₁WI, the scope of low signal diminution and edema relief of spinal cord on T₂WI (Fig.4).

**DISCUSSION**

Delayed myelopathy with a retained foreign body in the spinal canal is uncommon in clinic. Only 10 cases had been reported before 1992.¹ All the cases had a similar history of no or minimal neurologic deficit after initial injury with a retained metal cutting weapon (knife or scissors) blade in spinal canal. But delayed myelopathy with an intraspinal nonmetal foreign body has not been reported. The intraspinal foreign body could directly come from primary injury and migrate from surrounding soft tissue to the spinal canal in a long time, because the patients had few symptoms and were unaware of foreign body presence at all.²⁻⁶ In this case, the patient had been stabbed in dorsal region by bamboo 4 years before and the wound healed well. He had no further complaints in the following 3 years and almost neglect the injury. When he was referred to the orthopaedic department as neurologic deficit of lower limbs, CT and MRI showed inflammatory lesion (tuberculosis) in spinal canal and intervertebral foramen, bone erosion of the right neural arches at the level of T₁₀⁻¹₁, and roentgenograms showed no abnormality. The major reasons of misdiagnosis were that the patient did not provide the history of back stabbing injury and the doctor couldn’t detect the scar in dorsal region. Rohde⁷ reported one case of foreign body granuloma mimicking a benign intraspinal tumor. The patient had undergone surgery of lumbar discectomy 23 years before and the cottonoid which could not be revealed by roentgenograms was inadvertently left in spinal canal.

From our case, we should realize that it is important to gather a full case history through physical examination. The foreign body granuloma should be considered in the differential diagnosis of the space occupying lesion in spinal canal of patients with a known history of a previous stab injury or spinal operation.⁷

There are two possible reasons for delayed myelopathy with a retained foreign body in spinal canal.¹⁻² The one is that foreign body becomes a mobile irritant to the cord and transfixation of the cord by a foreign body impede the normal movement of the spinal cord, which could result in myelopathy.⁵⁻⁶⁻⁸ The other is that foreign body produces inflammatory reaction with granuloma and undergoes various degree of corrosion after
The specific tissue toxicity of corrosion products and surrounding inflammation are determined by the type of metal implanted. Nonmetallic foreign body (gauze or cottonoid) induces inflammatory reaction and granuloma. In the present case, the initial stab of bamboo stick does not cause direct spinal cord injury. However, the foreign body produced chronic inflammatory reaction and gradual augmented granuloma and delayed myelopathy resulted from pressure effect of granuloma. Existence of the foreign body can not eliminate inflammatory reaction and granuloma, so spinal cord compression can not be resolved thoroughy. Removal of intraspinal foreign bodies is essential, and postoperative neurologic outcome is satisfactory in most cases.

The patient’s neurologic deficit was improved promptly after operation. Three months later, MRI showed regression of spinal cord oedema and compression. The decision to surgically remove retained intraspinal foreign bodies is often difficult in the absence of a neurologic deficit. Former data indicate that inflammatory reaction and granuloma is believed to be the major cause of delayed neurologic deficit, surgical extraction of foreign bodies retained within the spinal canal may obviate infection, myelopathy, and delayed neurologic deficit. Therefore, intraspinal foreign body should be removed as early as possible even though the patient has few or no symptoms.

REFERENCES


(Received October 22, 2007)