

Case Report

Delayed myelopathy secondary to stab wound with a retained blade tip within the laminae: case report

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Abstract: Delayed neurologic deficit after a stab wound with a retained foreign body near the spinal canal is unusual, adequate radiological examination is fundamental in detecting retained foreign bodies, especially the CT scan, surgical extraction of the foreign body is the primary task and the surgical outcome is satisfactory. Here, we report a rare case of delayed myelopathy caused by spinal stenosis secondary to broken blade tip within thoracic laminae in an old man, who was injured in a knife attack 39 years ago. The incidence, clinical presentation, diagnosis and prognosis are discussed.

Keywords: Delayed neurologic deficit, stab wound, retained foreign body

Introduction

Most neurological deficits associated with stab wounds to the spinal column occur at the time of the injury [1]. Delayed neurologic deficit after a stab wound with a retained foreign body in the spinal canal is unusual and needs to be recognized [2, 3]. Here we report a rare case of delayed myelopathy caused by spinal stenosis secondary to broken blade tip within thoracic laminae in an old man, who was injured in a knife attack 39 years ago.

Case report

A 61-year-old man presented bilateral leg weak for 3 months without any disposing factors, physical therapy and acupuncture therapy did not work. In physical examination, abnormal sensation was detected below the groin level and the muscle power of the left leg was 2/5, while the bilateral Hoffmann's sign were negative, thoracic spinal stenosis was suspected and we suggested him the thoracic MRI examination. But oddly, the MRI machine was hard to provide clear image, metal implant in his body was suspected, roentgenograms of thoracic spine revealed a foreign body compatible with a broke blade of knife buried inside the left lami-

nae of T11 (**Figure 1**). Computerized tomography demonstrated a metallic foreign body passing through the left T11 laminae along with local bone hyperplasia, leading to the spinal stenosis (**Figure 2**), three-dimensional CT reconstruction showed the blade tip was embedded within the vertebral body and the blade end located in the connection of spinous process and lamina (**Figure 3**). There was no recent history of trauma, but on close questioning the patient related that he had been stabbed in the back with a knife 39 years ago. At that time, he just felt back pain without neurological deficit, the wound was closed primarily, he forgot this injury experience completely, only a small well healed 1×0.3 cm scar left on his back, no one told him that the knife was broken, nor the blade tip might be left in his body.

Intraoperative view showed that the blade was buried extending through the left T11 laminae into vertebrae, bone hyperplasia of laminae was very serious and the rusty broken blade lay firmly inside the laminae (**Figure 4**). The blade was taken out together with the left laminae and part of the left T11 vertebrae, then anterior reconstruction using Titanium mesh was performed (**Figure 5**). The patient's immediate postoperative neurological examination was

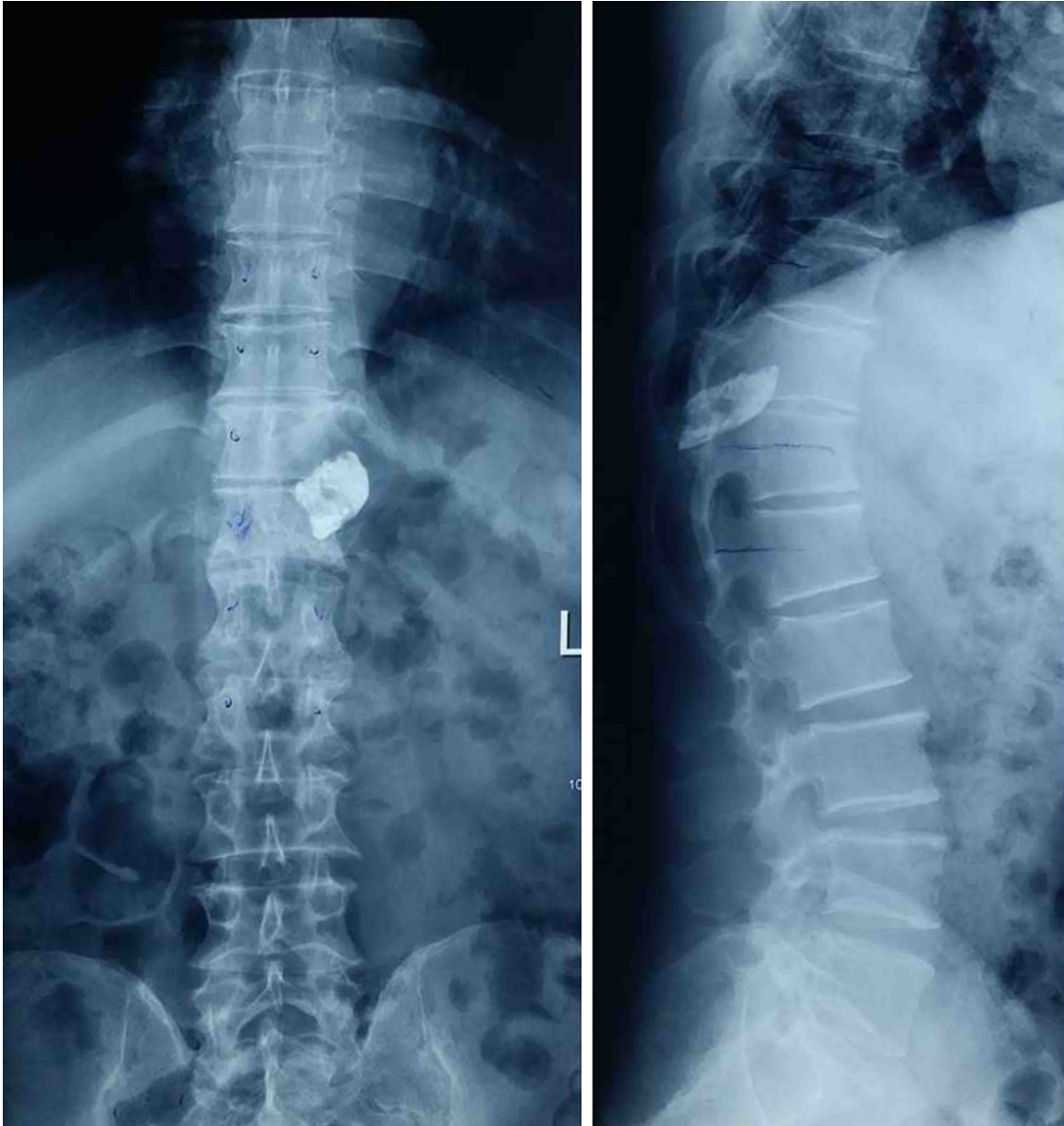


Figure 1. X-ray showed a blade tip located within the T₁₁₋₁₂ intervertebral foramen.

unchanged, three months after the operation, the muscle power of bilateral legs was 4/5 and the sensation below the groin level returned to normal.

Discussion

Stab wounds of the spinal cord are relatively uncommon in most parts of the world [4], and the delayed myelopathy caused by retained intraspinal foreign body is much more seldom to be seen, since the first report by Guillian and Garcin in 1931 [5], a review of the literature

revealed only 11 reported cases of delayed myelopathy secondary to retained spinal foreign bodies. All the cases remain asymptomatic for a prolonged time only to produce a neurologic deficit years later [6]. Most of the victims are young men, as more than 70% being 15 to 45 years old. The clinical manifestation included paraplegia or paraparesis in seven patients, Brown-Sequard syndrome in two patients, monoparesis in one patient and hemiparesis in one patient. The onset of delayed myelopathy ranged from 17 months to 36 years after the

Delayed myelopathy secondary to stab wound

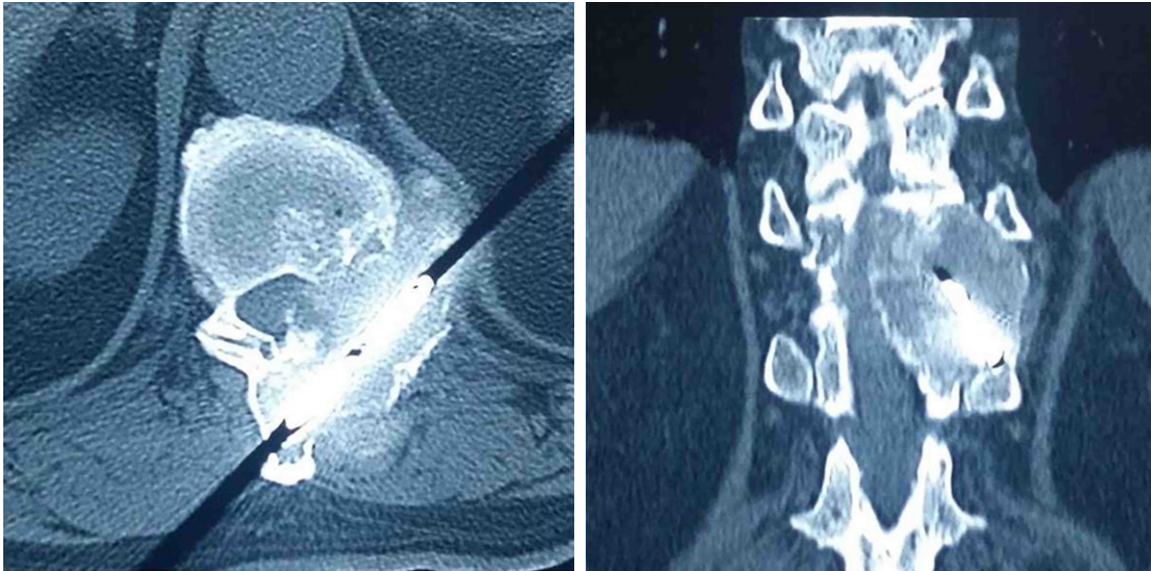


Figure 2. CT scan showed the blade tip embedded within the left T11 laminae along with local bone hyperplasia, leading to the spinal stenosis.

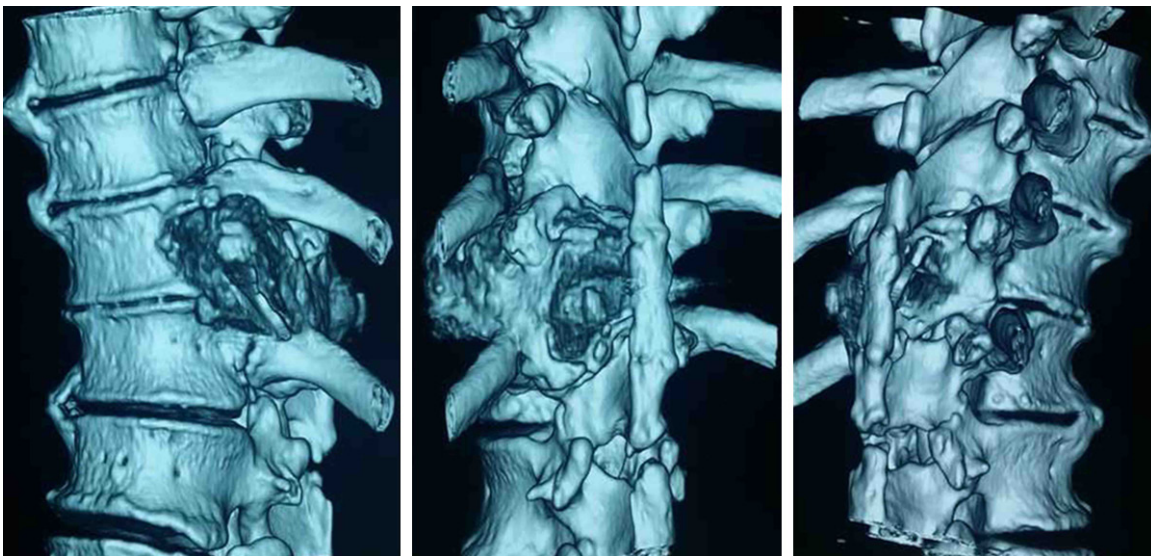


Figure 3. Three-dimensional CT reconstruction showed the blade tip was embedded within the vertebral body and the blade end located in the connection of spinous process and lamina.

wound. The specialty of our case is the 39 years duration from injury to the paralysis, which is longer than the 36 years reported by Jones in 1943 [7] (the longest in the literature).

There are many possible causes for delayed neurologic deficit with a retained foreign body. Firstly, the metallic foreign body exhibited extensive rusting and corrosion, the inflammatory reaction to corrosion products was described in almost all the cases ranging from diffuse arach-

noiditis to granuloma formation [8]. The initial penetration of the foreign body may not deep enough or far away from the spinal cord to cause immediate spinal cord injury, then the metallic foreign body underwent various degree of corrosion and inflammatory reaction, which might result in pressure effect or direct compression to the spinal cord. Another possible cause is the second relatively minor traumatic episode [2], as Abhaya noted that the transfixing of the spinal cord may cause slowly progres-



Figure 4. Intraoperative view showed that the blade was embeded within the left T11 laminae and severe bone hyperplasia of laminae.

sive damage as the cord is no longer free to move with normal body movements and, instead, is continuously and repeatedly stretched—essentially a “tethered cord” [9]. In our patient, the mechanism of deficit was the progressive thoracic spinal stenosis caused by the bone hyperplasia of the laminae around the blade, as evidenced by CT presentation. The blade tip embedded within the vertebral body and the blade end located in the connection of spinous process and lamina, suggesting that the knife was pierced from right-back side. Coincidentally, the blade was completely buried within the left T11 laminae without exposure to spinal cord initially, and the special position of blade was the reason for why not immediate neurologic deficit did occur at the injury moment.

Adequate radiological examination is fundamental in detecting retained foreign bodies, even in the absence of neurologic symptoms and signs [6]. Plain roentgenograms normally demonstrate fracture sites and the types of for-

eign bodies, but fail to show non-radiopaque fragments, such as glass and aluminum. CT not only shows all types of foreign body fragments, but also demonstrates the relationship of these fragments to the dural sac [4]. MRI is required if no retained fragment is seen on the plain radiographs and CT, and is able to rule out a space-occupying lesion within the spinal canal, such as a hematoma or abscess. In our patient, the MRI machine was hard to provide clear image, because the metal artifact obscure the MRI images. Notably, if a retained metal fragment is present, MRI can be potentially dangerous, as the high magnetic fields may dislodge and move the fragment and lead to minor traumatic episode [9]. We suggest that CT scan should be the first choice if retained foreign body around spinal canal is suspected.

The decision to surgically remove retained intraspinal metallic foreign bodies is necessary in the presence of a neurologic deficit, because it generally improves symptoms, prevents pro-

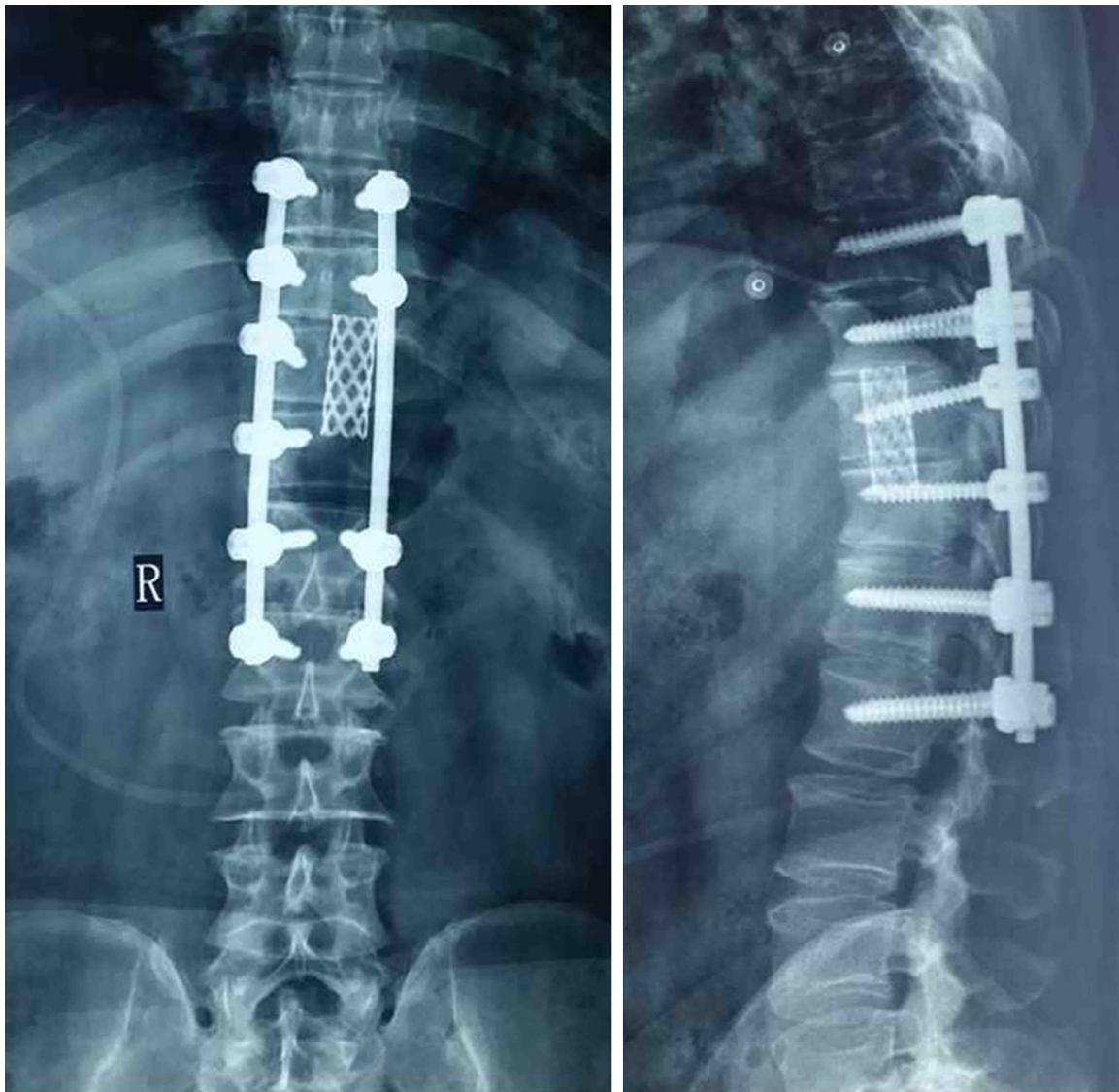


Figure 5. After remove the foreign body, anterior reconstruction using Titanium mesh was performed.

gression of disease, and prevents possible complications [1]. All the eleven patients underwent operation for removal of foreign body, the neurologic condition improved in eight patients, remained unchanged in two patients, and worsened in one patient. In our patient, after remove the foreign metal body, effective decompression of spinal cord was achieved by resecting the spinous process, left T11 laminae, facet joint, part of T11 vertebrae in left side, and we reconstructed the anterior spinal column by a titanium mesh. The patient got satisfactory recovery three month after the operation, strength of bilateral lower extremity muscles improved from preoperative grade II to grade IV, sensation in the lower limb returned to normal.

In conclusion, delayed neurologic deficit after a stab wound with a retained foreign body near the spinal canal is rare, adequate radiological examination is fundamental in detecting retained foreign bodies, especially the CT scan, surgical extraction of the foreign body is the primary task and the surgical outcome is satisfactory.

Disclosure of conflict of interest

None.

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