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Retained knife fragment in thoracic
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ABSTRACT

This case report presents a rare instance of a retained knife fragment within the thoracic spine following a stab injury in a 24-year-old male. The patient presented with stable vitals and no neurological deficit despite the knife penetrating near the spinal cord at the T9-T10 level. Prompt imaging, surgical intervention, and multidisciplinary coordination resulted in complete recovery without a lasting neurological deficit. This case highlights the importance of rapid assessment and careful surgical management in preventing secondary injury.

INTRODUCTION

Penetrating spinal injuries constitute a relatively uncommon subset of spinal trauma, accounting for a small percentage of all spinal cord injuries worldwide. Their epidemiology and mechanisms vary significantly depending on geographic, social, and economic factors. According to Wyndaele and Wyndaele (2006), the global incidence of spinal cord injuries ranges from 10 to 83 cases per million population annually, with stab and knife injuries forming a minor but clinically significant proportion [1]. These injuries most frequently involve the thoracic region, owing to its relative immobility and narrow canal diameter [2].

The neurological presentation in such cases is diverse and depends on the depth and trajectory of penetration. Waters et al. (1995) reported that stab-induced spinal injuries often present with incomplete lesions and demonstrate better recovery potential than blunt trauma, given the localized nature of cord damage [2]. However, retained knife fragments within the spinal canal are particularly rare, posing both diagnostic and therapeutic challenges. Early radiological assessment and multidisciplinary coordination are critical for preventing secondary cord injury. The present case adds to the limited literature describing thoracic spinal stab wounds with retained metallic fragments but preserved neurological function, emphasizing the importance of timely surgical management.

Keywords

penetrating spinal injury,
retained knife,
thoracic spine,
neurological recovery,
neurotrauma



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CASE REPORT

A 24-year-old male presented to the emergency casualty after being stabbed during a physical assault. On examination, two linear stab wounds measuring approximately 3–5 cm × 1–2 cm and 4–5 cm × 1–2 cm were noted in the left sub-scapular paraspinal region, with active bleeding at presentation. The patient was hemodynamically stable (GCS 15/15) and demonstrated full motor power (5/5) in all four limbs with no neurological deficit. An initial X-ray suggested possible thoracic involvement (Figure 1).

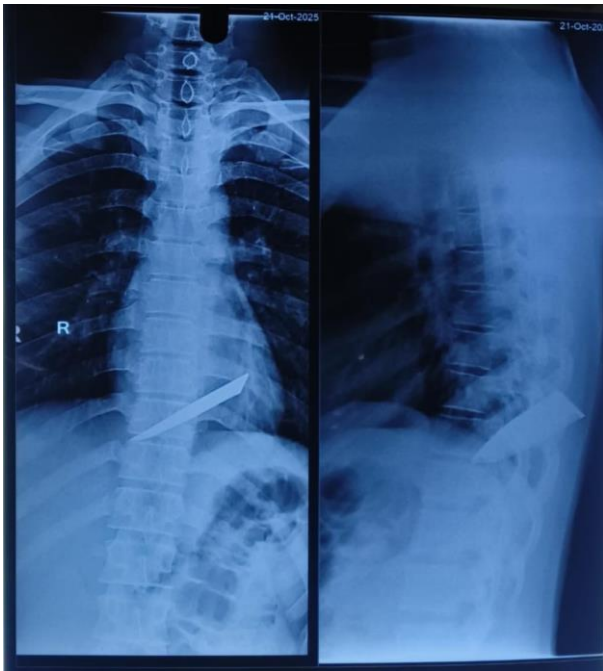


Figure 1. Chest X-ray showing the retained knife fragment.



Figure 2. Knife blade around the vertebral body in HRCT.



Figure 3. 3DCT spine image showing the knife in the vertebra at the T9-T10 level.

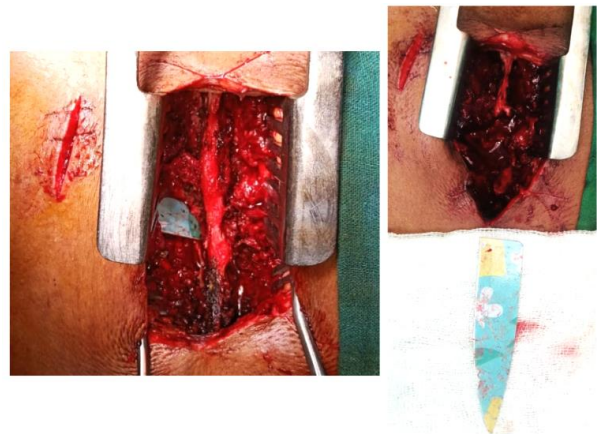


Figure 4. Retained knife in the vertebra and its comparison to the incision wound and nearby stab wound.

After wound closure and stabilization, HRCT thorax and 3D spine reconstruction were performed, revealing a retained metallic knife fragment tracking towards the vertebral body at T9–T10 (Figures 2 and 3). The patient underwent surgery after consent and preparation. A midline posterior incision was made, and the muscle planes were separated under X-ray guidance. Partial laminectomy was performed, revealing the knife transecting the posterior spinal cord and dura (Figure 4). The knife was carefully extracted, dura repaired, hemostasis ensured, and

closure done with drain placement. Postoperatively, the patient developed mild bilateral lower limb weakness (power 4/5). MRI findings suggested postoperative edema, and the patient was managed conservatively with physiotherapy, leading to full neurological recovery. Postoperative X-rays confirmed successful removal (Figure 5). The patient was discharged without any residual deficit.



Figure 5. Postoperative MRI suggesting postoperative edema.

DISCUSSION

Penetrating spinal injuries from sharp objects such as knives are most often the result of interpersonal violence, and their management requires a precise understanding of spinal anatomy and the mechanism of injury [1]. While gunshot wounds dominate spinal trauma in Western literature, knife-induced injuries remain more common in developing

countries, often affecting young males in assault-related scenarios [3].

The absence of neurological deficit in the presence of a retained intramedullary or intradural knife fragment, as seen in this patient, is exceptionally rare. Li et al. (2012) described a similar thoracic stab injury with a retained knife blade and no neurological deficit, underscoring that the final outcome depends largely on the injury trajectory and avoidance of vascular or neural structures [4]. Early and accurate imaging, including CT and 3D reconstruction, remains essential for localization and surgical planning, minimizing intraoperative risk.

Surgical extraction should be performed under direct visualization to prevent further cord damage.

In our case, careful laminectomy and controlled removal of the blade, followed by dural repair and hemostasis, resulted in complete neurological recovery—consistent with the favorable outcomes reported by Ndoumbe et al. (2015), where early intervention and absence of preoperative deficits predicted better prognosis [3].

Overall, literature supports that patients with stab-related spinal trauma, particularly those with incomplete or no initial neurological deficits, exhibit a high potential for functional recovery [2, 3]. This reinforces the critical role of multidisciplinary management involving emergency, radiology, and neurosurgical teams in optimizing outcomes for such rare and high-risk injuries.

CONCLUSION

Early imaging, surgical precision, and coordinated multidisciplinary management led to full recovery without neurological deficit in this rare case of retained knife fragment within the thoracic spine. Such cases highlight the potential for excellent outcomes even in penetrating spinal trauma when managed promptly and appropriately.

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