

CASE REPORT

Glass foreign body in the lumbosacral junction of the spinal canal: a case report

Kook-Jong Kim¹, Hyun-Chul Shon¹, Eic-Ju Lim¹, Jae-Young Yang^{1,*}

¹Chungbuk National University Hospital,
28644 Cheongju, Republic of Korea

***Correspondence**

hahayourdead@naver.com
(Jae-Young Yang)

Abstract

Foreign bodies in soft tissue after trauma are common, and the smaller the wound, the easier it is to miss them. Moreover, undetected foreign bodies can lead to severe complications. A 60-year-old male patient presented to our emergency room with a 4-cm back laceration and a slightly decreased sensation in the left S1 dermatome after falling over a glass fish tank. A foreign body on the left side of the L5/S1 epidural space and S1 nerve root compression in the lateral recess were observed. Consequently, a midline longitudinal incision was made at the L5/S1 level, a paravertebral muscle subperiosteal dissection was performed, and the foreign body was carefully removed. Foreign bodies may exist even in simple, small wounds. Therefore, their presence should be confirmed or excluded through appropriate imaging and history-taking.

Keywords

Foreign body; Lumbosacral junction; Spinal canal

1. Introduction

Foreign bodies in soft tissue after trauma are common, and the smaller the wound, the easier it is to miss them. Additionally, foreign bodies can cause several distinct symptoms; however, occasionally, no symptoms may occur, and they may be difficult to detect. Undetected foreign bodies can lead to severe complications, and they are the fifth most common lawsuit filed against emergency physicians. Foreign bodies in the spinal canal are rarely reported [1, 2]. According to the authors' investigation, in most cases, foreign bodies in the spinal canal after trauma were not diagnosed at early onset but rather diagnosed later after the symptoms had developed. Therefore, we report a rare case of a glass foreign body in the spinal canal accompanied by a small wound that was diagnosed early and treated successfully through the use of good clinical imaging.

2. Case presentation

A 60-year-old male patient presented to our emergency room with a back laceration and pain. Two hours before the visit, the patient drank, fell over a glass fish tank, and independently walked to the hospital. All vital signs were within the normal range, and the patient was mentally alert. However, physical examination revealed an inverted U-shaped laceration measuring approximately 4 cm in the left lower back (Fig. 1). Wound exploration was performed in the emergency department, and no cerebrospinal fluid leakage was observed. The patient complained of back pain, and chest and abdomen computed tomography (CT) was performed since it was a blunt trauma

accompanied by penetrating injury; however, no abnormal findings were observed in solid organs. Radiography performed immediately revealed a radiopaque signal in the left L5/S1 spinal canal (Fig. 2). In the subsequent neurological examination, the motor grade of both lower extremities was normal; however, the left S1 dermatome had a slightly decreased sensation of 80% compared with the right side. No pathological reflexes were observed. Lumbosacral CT and magnetic resonance imaging were performed to determine the foreign body's exact location and its relationship with the spinal cord and roots. A foreign body and S1 nerve root compression were observed on the left side of the L5/S1 epidural space and in the lateral recess, respectively (Figs. 3,4). Emergency surgery was immediately performed. The surgery was performed using a Wilson frame with the patient in the prone position under general anesthesia. After checking the level with fluoroscopy, a midline longitudinal incision was made at the L5/S1 level, and paravertebral muscle subperiosteal dissection was performed. L5/S1 left partial laminectomy was also performed, and the foreign body was carefully removed. However, no dural tears were observed upon microscopic examination (Fig. 5), and no foreign body was found in the imaging test performed immediately after the surgery. The neurological test revealed that both lower extremity motors were intact, and the sensory decrease in the left S1 dermatome improved. The patient was discharged without any symptoms or infection 1 week post-operatively and subsequently underwent outpatient follow-up without significant complications reported up to the final follow-up appointment 1 year postoperatively.



FIGURE 1. An inverted U-shaped laceration observed on the left lower back and does not appear deep.

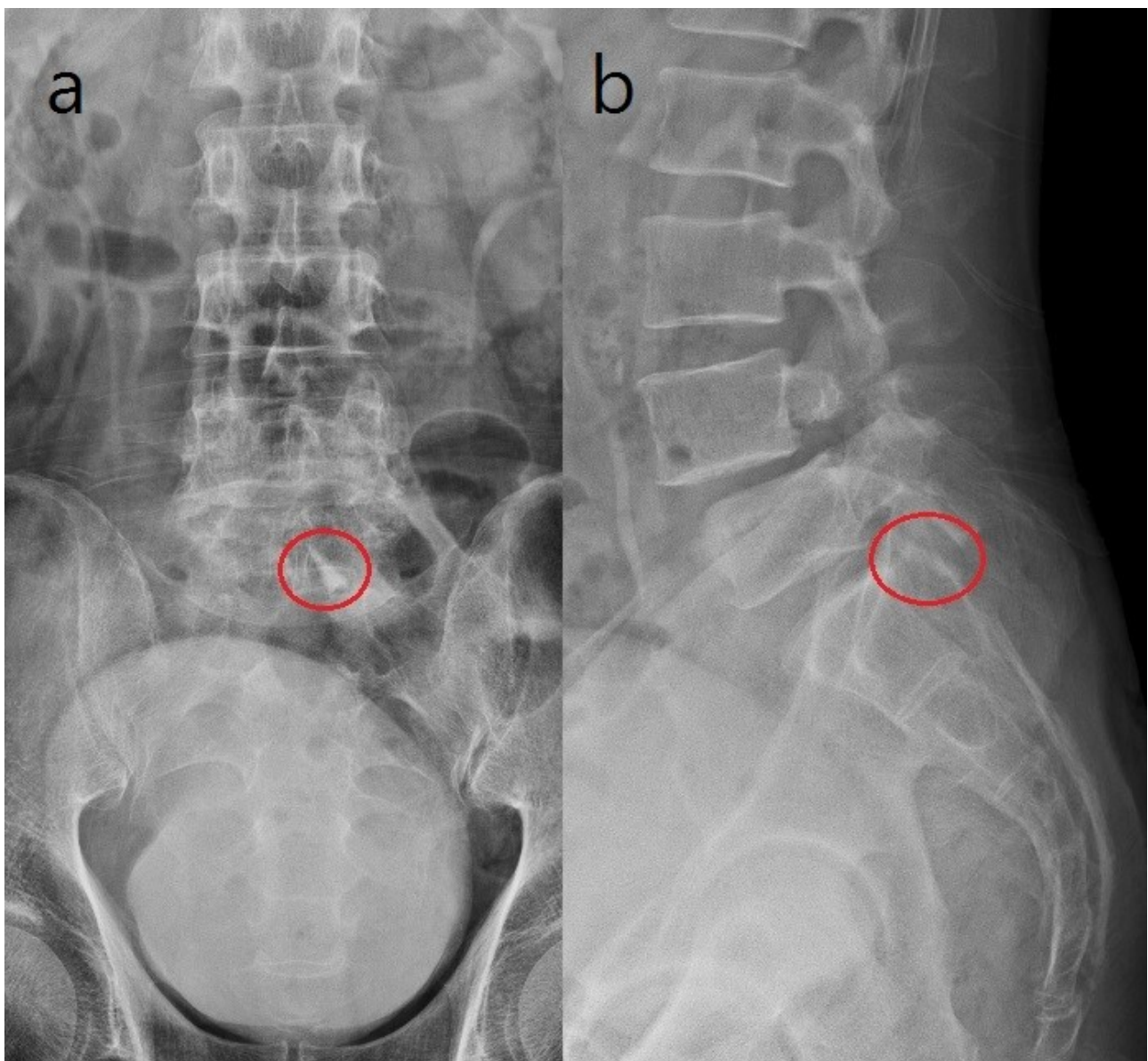


FIGURE 2. A radiopaque signal observed in a red circle on the lumbar radiograph. (a) lumbar anterior posterior view, (b) lumbar lateral view.

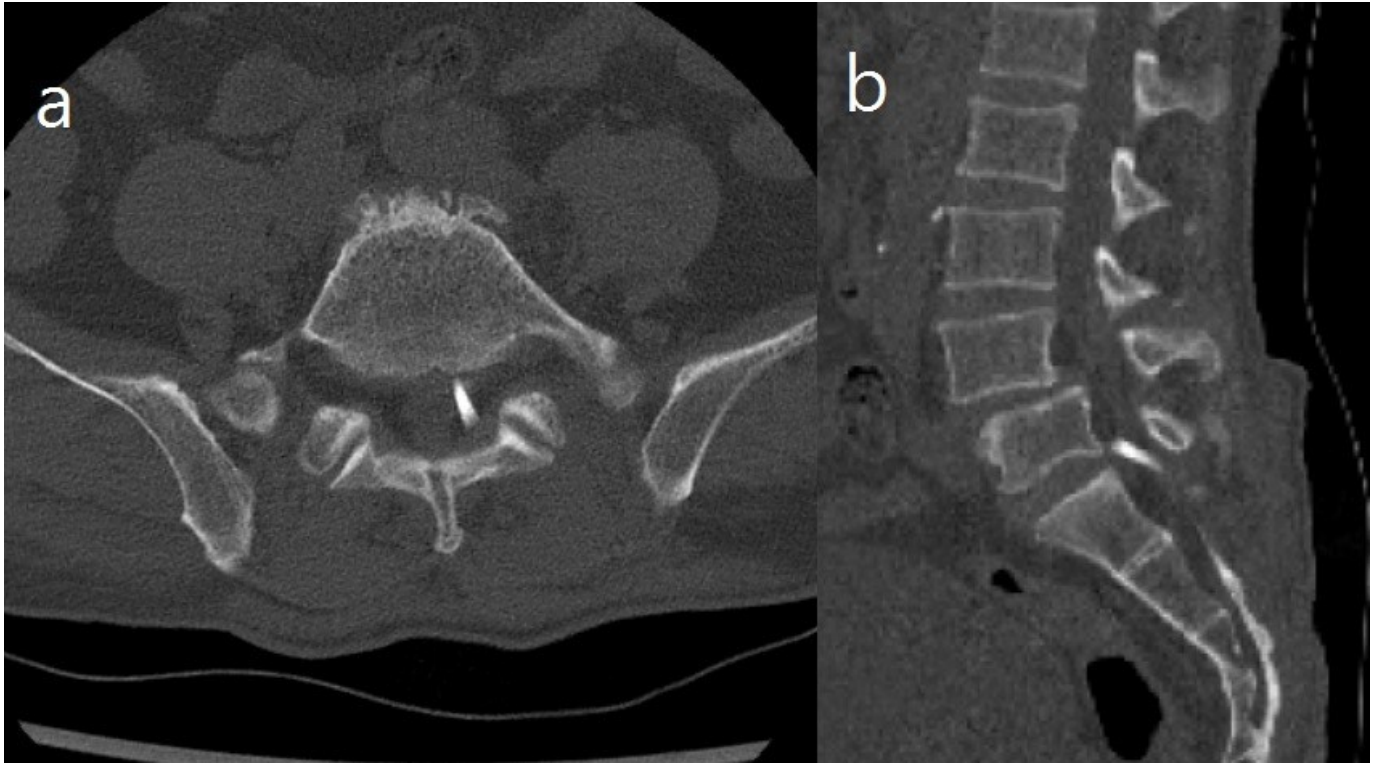


FIGURE 3. Computed tomography showing a high-density foreign body in the L5/S1 spinal canal. (a) axial view, (b) sagittal view.

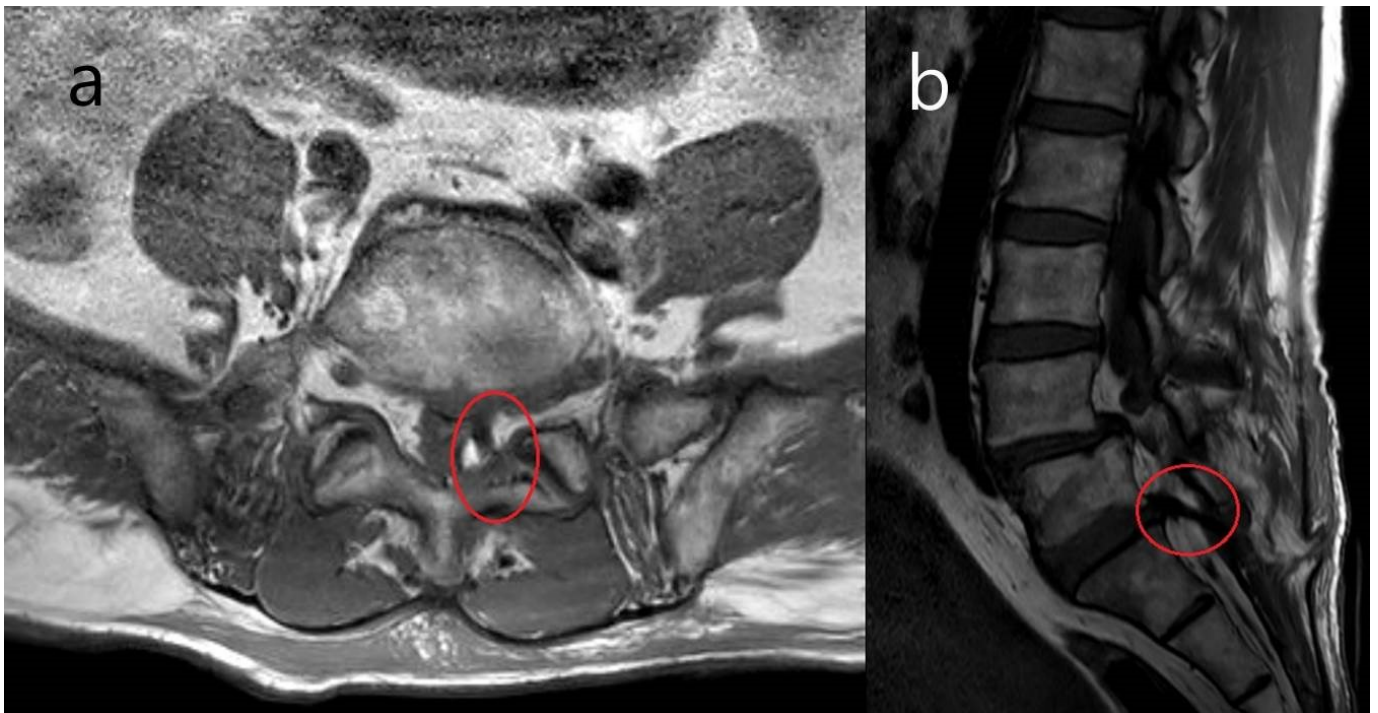


FIGURE 4. Magnetic resonance imaging showing a linear dark signal material compressing the left S1 nerve root at the lateral recess of the L5/S1 level. (a) T1 axial view, (b) T1 sagittal view.

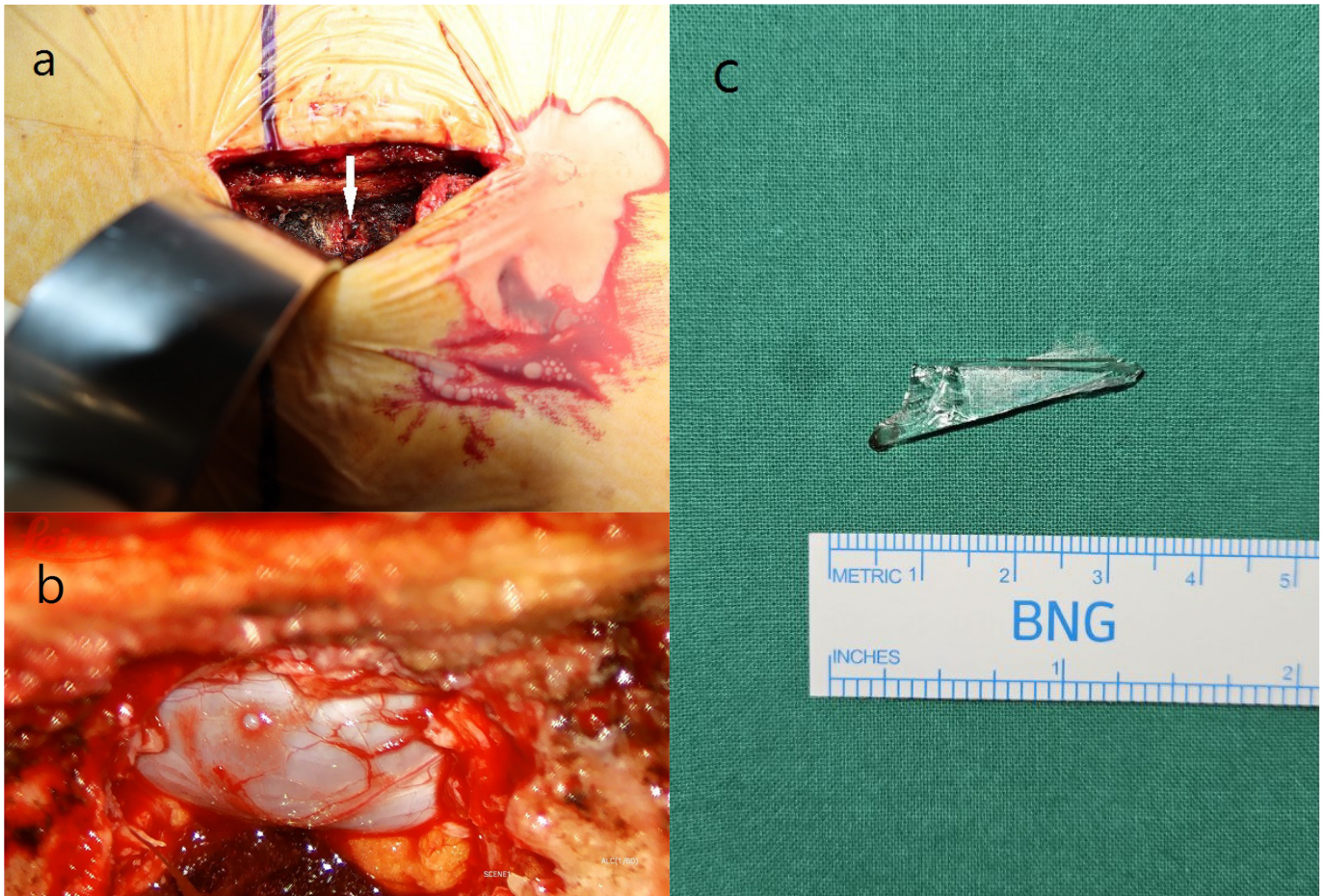


FIGURE 5. Operative findings. (a) A glass foreign body observed in the L5/S1 interlaminar space (white arrow). (b) No dural tear observed under microscopic examination after the foreign body removal. (c) A glass fragment of approximately 3 cm \times 1 cm.

3. Discussion

Foreign bodies in soft tissue can cause various symptoms, such as persistent pain, delayed wound healing, and infection [3, 4]. In addition to these symptoms, foreign bodies within the spinal canal can cause various neurological symptoms, including paralysis. Anatomically, the spinal canal is surrounded by a vertebral bony structure and can be connected to the outside through the intervertebral foramen or interlaminar space. In this case, the foreign body passed through the interlaminar space and entered the spinal canal, causing root symptoms.

Retained foreign bodies in the spinal canal have rarely been reported [1, 2]. According to the authors' investigation, foreign bodies in the spinal canal were discovered late after symptoms appeared if there was no clear history of foreign body penetration initially. Kawtharani [2] reported a case where a needle was detected in the thoracic spinal canal in a 2-year-old male patient who presented with fever and mild weakness in the lower extremities. Jesmanas *et al.* [1] also reported acute transverse myelitis caused by retained glass fragments in the cervical spinal canal 30 years after the initial glass injury. Graham [5] reported that foreign bodies are missed in 15%–31% of cases due to wound exploration alone without appropriate imaging examination.

According to Kaiser *et al.* [6], the most common foreign

body in soft tissue was glass, where the sharp edge of the glass facilitates penetration into soft tissue, followed by metal, stone, wood and plastic. Glass, metal and stone are radiopaque; therefore, they can be detected using radiography or CT. In contrast, wood is radiolucent, and its detection using radiography or CT is difficult; therefore, ultrasonography (US) is recommended. Furthermore, plastic encompasses a wide spectrum of materials and may be undetectable in radiography or CT. Therefore, US is recommended for its detection [7–9].

In our case, the patient presented with a simple laceration after trauma. Initially, the patient requested simple suturing without imaging because of the high cost. However, the possibility of the presence of a glass foreign body and the need for imaging was explained, and the patient provided consent for the imaging examination to be performed. Finally, a glass foreign body in the spinal canal was diagnosed early and successfully treated.

We encountered the rare occurrence of a foreign body in the spinal canal after trauma, which was diagnosed early with good clinical photographs and treated successfully. Foreign bodies should be suspected even when the wounds are simple and small, and their presence should be confirmed or excluded through appropriate imaging examinations and history-taking.

ABBREVIATIONS

CT, computed tomography; US, ultrasonography.

AVAILABILITY OF DATA AND MATERIALS

The data presented in this study are available on reasonable request from the corresponding author.

AUTHOR CONTRIBUTIONS

KJK—treated the patient and reviewed the manuscript; HCS and EJJ—performed the literature research and reviewed the manuscript; JYY—performed the literature review and wrote the manuscript. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Institutional Review Board of Chungbuk National University Hospital (approval number: CBNUH 2024-02-003), and the patient provided informed consent for the data concerning his case to be submitted for publication.

ACKNOWLEDGMENT

Not applicable.

FUNDING

This research received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

- [1] Jesmanas S, Norvainytė K, Gleiznienė R, Mačionis A. Retained glass fragment in the cervical spinal canal in a patient with acute transverse myelitis: a case report and literature review. *Case Reports in Neurological Medicine*. 2018; 2018: 5129513.
- [2] Kawtharani S, Bsat SA, El Houshiemy M, Moussalem C, Halaoui A, Omeis I. Retained foreign needle in the thoracic spinal canal in a child: case report. *Surgical Neurology International*. 2021; 12: 484.
- [3] Kirby D, Seigerman D. Pre-operative ultrasound localization for removal of a penetrating foreign body of forearm. *Cureus*. 2022; 14: e26940.
- [4] Verma A, Tran Z, Hadaya J, Williamson CG, Rahimtoola R, Benharash P. Factors associated with retained foreign bodies following major operations. *The American Surgeon*. 2021; 87: 1575–1579.
- [5] Graham DD. Ultrasound in the emergency department: detection of wooden foreign bodies in the soft tissues. *The Journal of Emergency Medicine*. 2002; 22: 75–79.
- [6] Kaiser CW, Slowick T, Spurling KP, Friedman S. Retained foreign bodies. *The Journal of Trauma and Acute Critical Care*. 1997; 43: 107–111.
- [7] Grocutt H, Davies R, Heales C. Ultrasound compared with projection radiography for the detection of soft tissue foreign bodies—a technical note. *Radiography*. 2023; 29: 1007–1010.
- [8] Tok S, Kadioglu E. Ultrasonography in soft-tissue foreign-body detection: a phantom study. *Polish Journal of Radiology*. 2021; 86: 496–499.
- [9] Voss JO, Maier C, Wüster J, Beck-Broichsitter B, Ebker T, Vater J, *et al*. Imaging foreign bodies in head and neck trauma: a pictorial review. *Insights into Imaging*. 2021; 12: 20.

How to cite this article: Kook-Jong Kim, Hyun-Chul Shon, Eic-Ju Lim, Jae-Young Yang. Glass foreign body in the lumbosacral junction of the spinal canal: a case report. *Signa Vitae*. 2024; 20(8): 103-107. doi: 10.22514/sv.2024.104.