



Case report

Penetrating Trauma to the Sacrum: A Case Report and Literature Review

Traumatisme pénétrant du sacrum : rapport de cas et revue de la littérature

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Résumé

Type d'étude : Rapport de cas et revue de la littérature.

Objectif : Présenter une localisation rare de lésion traumatique pénétrante du rachis et réaliser une revue de la littérature.

Contexte : Les traumatismes pénétrants du rachis sont rares en dehors des lésions par arme à feu, particulièrement au niveau du sacrum. Leur prise en charge n'est pas codifiée.

Méthodologie : Un homme de 22 ans a reçu un coup de tournevis dans le bas du dos lors d'une rixe. Il s'est présenté avec une partie du tournevis en place, sans déficit neurologique. La radiographie montrait une tige radio-opaque enfouie dans le corps de S3. Le tournevis a été extrait sous anesthésie locale, puis l'orifice suturé. Une prophylaxie antitétanique et antibiotique a été administrée.

Résultat : Le patient est sorti après 24 heures de surveillance sans complication, avec un examen neurologique normal au suivi.

Conclusion : Le retrait direct sans exploration chirurgicale peut être envisagé en l'absence de déficit neurologique, de fuite de LCS, d'infection locale ou de corps étranger entièrement enfoui sous la peau.

Mots-clés : Traumatisme pénétrant ; sacrum ; rapport de cas.

Abstract

Study design: Case report and literature review.

Objective: To present a rare location of a penetrating spinal injury and review the literature.

Background: Penetrating spinal injuries are rare outside the context of gunshot wounds and are particularly uncommon at the sacrum. Few cases have

been reported, and management is not standardized.

Methodology: A 22-year-old man was stabbed in the lower back with a screwdriver during a brawl. He presented with part of the screwdriver retained and was neurologically intact. Plain radiographs showed a radiopaque shaft embedded in the S3 body. After skin preparation, the screwdriver was removed under local anaesthesia and the entry wound was sutured. He received tetanus prophylaxis and intravenous followed by oral antibiotic prophylaxis.

Results: The patient was discharged after 24 hours of observation without complications. His neurological examination remained normal throughout follow-up.

Conclusion: Based on sacral anatomy and the literature, direct removal without open surgical exploration may be considered when there are no neurological deficits, cerebrospinal fluid leakage, local infection or a completely subcutaneous retained foreign body.

Keywords: Penetrating injury; sacrum; case report.

Introduction

Trauma is considered penetrating when the injuring object passes through the skin and reaches underlying anatomical structures [6].

Penetrating spinal trauma is uncommon in most regions, except in South Africa, where Peacock et al. reported 450 cases over 13 years [18]. Firearm injuries are the most frequent cause in the literature [2,5,15], whereas non-ballistic penetrating injuries are less common [4]. To our knowledge, the only sub-Saharan African series was reported by Gueye et al. in 1998 and included six penetrating spinal injuries among 16 patients [8].

Cervical and thoracic injuries are most frequent [18,24]. We report an unusual sacral injury and discuss the factors required for rapid and effective management.

Clinical case

A 22-year-old man with no relevant medical history presented to the emergency department of Ziguinchor Regional Hospital at 10:00 after an altercation at approximately 23:00 the previous evening. He had been struck in the lower back with a screwdriver. He experienced severe lumbar pain without falling, first attended a health centre and was then referred to our hospital.

Approximately 11 hours after injury, he had no neurological deficit, cerebrospinal fluid leakage, sphincter dysfunction or clinical evidence of intraperitoneal organ injury. He was graded ASIA E. A metal shaft was visible 1 cm right of the midline and 3 cm above the intergluteal cleft, fixed to deep tissues; the surrounding skin was intact but tender. The object was the shaft of a reversible screwdriver whose handle had detached after impact. Anteroposterior and lateral lumbosacral radiographs showed the shaft crossing the sacral canal and S3 body without extending beyond the anterior cortex. Additional imaging was unavailable. Direct removal was planned in the treatment room, with surgical and anaesthetic teams prepared for operative exploration if complications occurred. The patient received intravenous amoxicillin–clavulanate 2 g and a tetanus booster. After povidone–iodine preparation and local infiltration with 1% lidocaine, the shaft was grasped with rongeur forceps and withdrawn along the angle of entry shown on the lateral radiograph. The wound was sutured. He was discharged home the following day and remained neurologically normal with satisfactory wound healing at 15 days, 1 month and 2 months.

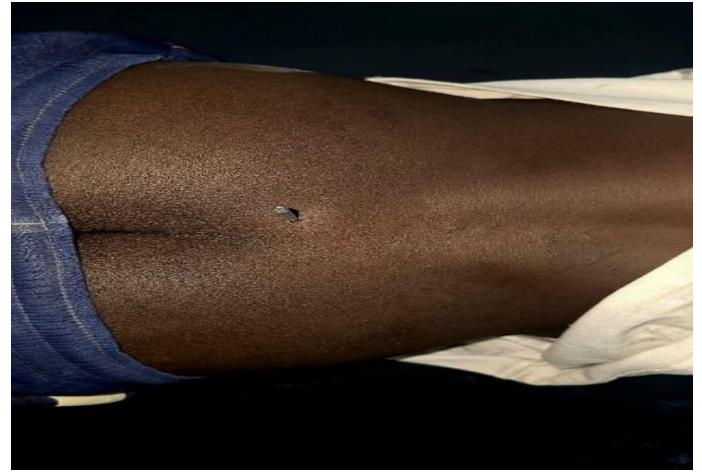


Figure 1A: Superior view of the retained metal shaft with the patient prone.

Figure 1B: Lateral view of the retained metal shaft with the patient prone.



Figure 2: Anteroposterior and lateral radiographs showing the radiopaque shaft traversing the S3 body

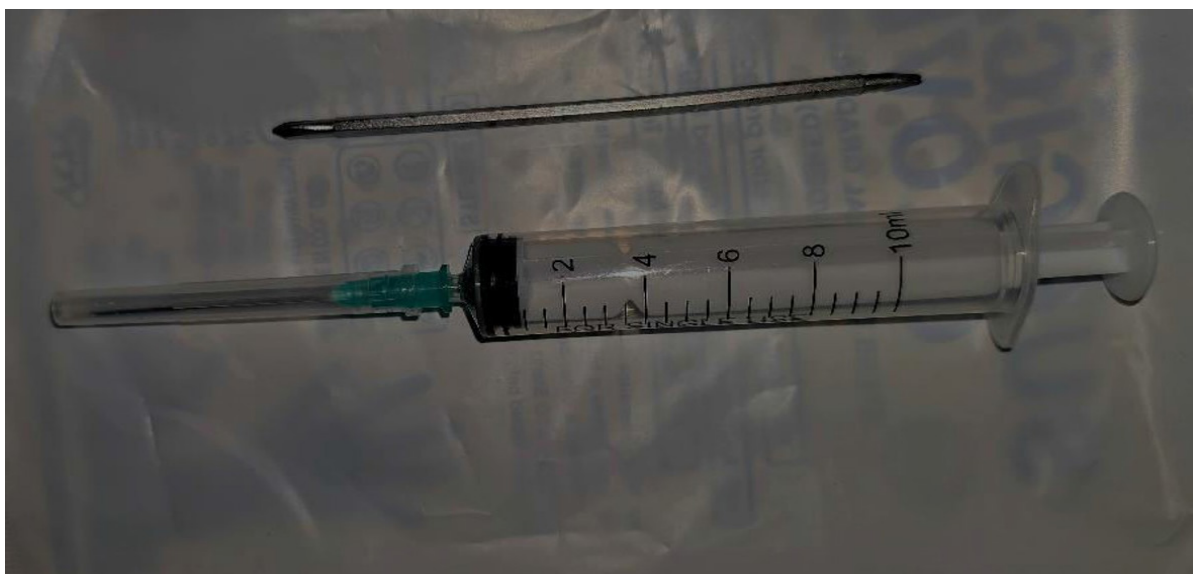


Figure 3: Extracted screwdriver shaft

Discussion

Frequency

Non-ballistic penetrating spinal injuries are rare at all levels, and evidence comes mainly from case reports rather than large hospital series [25]. The largest series were published in South Africa [7,18]. Seroto et al. reported 96 patients in 2021, none with sacral involvement [24]. Series from the United States and India generally included fewer than five cases per year [10,26,28].

This was the first case managed in our department over five years. Lumbosacral injuries are less common than cervical or thoracic injuries [23]. Sacral penetration often follows a perineal injury after a fall onto a sharp object rather than a direct blow to the sacrum [12,32]. In assaults, the cervical and thoracic regions are more frequently targeted [21,28].

Age and sex

The young age and male sex of our patient are consistent with previously reported cases [7,17,18,28].

Injuring object and circumstances

A wide range of objects has caused penetrating spinal injuries, including knives, glass fragments and wood [2,16,17,28]. During assaults, the object may remain intact, be removed by the assailant or break during withdrawal, leaving a deeply retained foreign body. In our patient, the screwdriver handle probably detached after impact.

Diagnosis

Diagnosis is straightforward when the object remains visible or when a radiopaque object is identified on targeted plain radiographs. Radiolucent objects such as wood or toothpicks may be missed on radiography and even on computed tomography, where low attenuation can be mistaken for air [9]. Diagnosis may therefore be delayed for weeks or years [11,13]. When a retained foreign body is suspected, close follow-up for progressive compressive myelopathy or suppuration at the entry site is required [9]. Magnetic resonance imaging may be useful only after excluding a ferromagnetic object, because movement in the magnetic field could cause new injury.

Treatment

Removal of a foreign body fixed to the spine can be difficult and may cause neurological injury. Extraction procedures are not standardized, and open or closed removal must be selected case by case [25,30]. In our patient, the absence of cerebrospinal fluid leakage, neurological deficits and cauda equina signs supported direct removal. The shaft crossed the sacral canal at the lower S3 level and then travelled superiorly. Roger et al. showed that the dural sac ends between the middle third of S1 and lower third of S2 in Black African adults [20]. The absence of a haematoma along the track also suggested no major vascular injury.

These findings did not support extensive surgical exploration and were consistent with larger series [14,18]. Direct withdrawal in neurologically intact patients has also been described by Villarreal-García et al. in Mexico and Sakar et al. in Türkiye [22,29]. Avoiding open exploration may reduce dural tears, infection, muscle-related pain, delayed wound healing and prolonged hospitalization. Antibiotic and tetanus prophylaxis help prevent delayed infection [31].

Limitations

Clinical assessment and plain radiography suggested the absence of neurological and associated injuries, but radiography was insufficient. Contrast-enhanced computed tomography, the reference examination for excluding hollow-viscus, vascular and urinary injuries, could not be performed because the scanner was unavailable and the patient could not afford transfer to another facility.

Table I: Published case reports of penetrating sacral trauma

Authors	n	Level	Object	Sex	Age	Neurological findings
Gul et al. (2010) [9]	1	S1–S2	Wood	M	23	S1–S3 hypoesthesia
Anderson et al. (2010) [1]	1	S3	Glass	M	6	Low-back pain; dural laceration
Brembilla et al. (2015) [3]	1	S1	Pencil	M	42	CSF leakage
Piqueras et al. (2006) [19]	1	L5–S1	Pencil	M	10	Cauda equina syndrome
Stern et al. (2011) [27]	1	S3	Nail gun	M	21	None

Conclusion

Penetrating sacral injuries are rare and their management is not standardized. Careful clinical assessment should guide treatment, supported when needed by imaging to identify residual foreign bodies and associated injuries. Direct removal without open exploration may be considered when there is no neurological deficit, cerebrospinal fluid leakage, local infection or completely buried foreign body, provided a surgical team is prepared to manage complications.

Ethical consideration

Written informed consent for publication was obtained from the patient. We thank him for his consent.

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Conflict of interest : None

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