

Thoracic and Abdominal Impalement with Metal Rods: A Case Report and Review of the Literature

Samuel BAMOGO^{1*}, Stéphane Mohamed TRAORE¹, Mamadou WINDSOURI¹

¹TINGANDOGO University Hospital, Ouagadougou, Burkina Faso

DOI: <https://doi.org/10.36347/sjmcr.2025.v13i10.110>

| Received: 29.08.2025 | Accepted: 25.10.2025 | Published: 31.10.2025

*Corresponding author: Samuel BAMOGO

TINGANDOGO University Hospital, Ouagadougou, Burkina Faso

Abstract

Case Report

Impalement injuries are exceptionally rare and often fatal at the scene. We report the case of a 17-year-old construction worker who sustained simultaneous thoracic and abdominal impalement by two metal rods following a fall. Both rods transversed the thoracic and abdominal cavities from left to right. Emergency surgery consisting of a midline laparotomy and bilateral anterolateral thoracotomies allowed controlled removal of the rods under direct vision. The patient underwent duodenal and pulmonary repair, transverse colostomy, and appropriate drainage. He recovered uneventfully and was discharged on postoperative day twelve. This case highlights the importance of strict adherence to Advanced Trauma Life Support principles, avoidance of premature removal of impaled objects, and rapid multidisciplinary surgical intervention in a tertiary trauma centre.

Keywords: Impalement injury, thoracic, abdominal, metal rods, ATLS, surgery.

Copyright © 2025 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution **4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Multiple impalement injuries are exceedingly rare, with only a few cases reported in the medical literature [1, 2]. These injuries result from objects that penetrate and remain embedded within the human body [1, 2]. In many instances, the impaled victim dies at the scene. However, patients who reach hospital alive and remain haemodynamically stable have a good chance of survival [3]. The fundamental principle of initial management is not to remove the impaling object, as it may be tamponading a vascular injury, thereby preventing catastrophic haemorrhage [3-5]. We report a rare case of combined thoracic and abdominal impalement caused by two metallic rods that transversed the thoracic and abdominal cavities from left to right.

CASE PRESENTATION

A 17-year-old construction worker fell from a height onto two metal rods, which impaled his left side. He remained trapped for approximately thirty minutes, suffering severe pain and mild continuous bleeding. Rescue workers cut the rods from the concrete column,

leaving them in situ, and transported him to TINGANDOGO University Hospital Centre. On arrival, he was conscious but in severe pain, with mild tachypnoea. His pulse was 118 bpm, blood pressure 100/60 mmHg, respiratory rate 30/min, Glasgow Coma Scale 15/15, and SpO₂ 90%. No significant past medical history was reported. Initial resuscitation followed ATLS guidelines, with oxygen administration and large-bore IV access. No imaging was performed. Broad-spectrum antibiotics and tetanus prophylaxis were prepared. The patient was taken immediately to theatre for midline laparotomy and bilateral anterolateral thoracotomies under general anaesthesia. Findings included a transfixing duodenal and colonic injury without vascular or hepatic lesions. Primary duodenal repair, transverse colostomy, drainage, and debridement were performed. Thoracic exploration revealed a lingular laceration without vascular injury, repaired after controlled rod extraction. Two chest drains were placed. The patient received antibiotics for 10 days, drains were removed on days 5 and 7, and he was discharged on day 12 in good condition, with bowel continuity restoration planned after 3 months.



Figure 1: Thoracic and abdominal impalement with two metal rods

DISCUSSION

Impalement injuries are classified into Type I (a moving body impacts a stationary object) and Type II (a moving object penetrates a stationary body). Most occur in road traffic or construction accidents. They have also been described in sexual activity-related perineal trauma and in rural settings, such as goring injuries in developing countries [6, 7]. This case underlines occupational hazards in developing countries due to absence and/or inadequate protective equipment [1, 3].

Early prehospital resuscitation and immediate surgery are essential [8, 9]. The impaling object must never be removed prehospital, as it may tamponade vital vessels [10]. Shortening it may facilitate transport [11]. Only in exceptional cases should removal be attempted (e.g., airway obstruction or interference with cardiopulmonary resuscitation) [7].

Impalement is a rare and dramatic form of penetrating trauma that cannot be managed using a rigid protocol [3, 4]. Combined thoracoabdominal impalement is sometimes referred to as a “double jeopardy” injury due to the complexity of managing both cavities [12].

Determining the trajectory of the foreign object helps identify potentially injured organs. Computed tomography and angiography should only be performed in haemodynamically stable patients [9, 13]. The emergency department should be alerted in advance to any special circumstances. Radiological imaging must not delay surgery, particularly when the patient's position or the foreign object itself makes imaging hazardous [14]. For this reason, no imaging was performed in our patient. In unstable patients or those

with peritonitis, evisceration, or impalement, surgical exploration is mandatory [15, 16].

Anaesthetic positioning may be challenging; semi-recumbent, seated, or right lateral decubitus positions may be necessary for intubation [9, 14]. Modifications of the operating table may also be required. If tracheobronchial injury is suspected, a double-lumen endotracheal tube is ideal [9, 14].

The surgical approach depends on the trajectory of the foreign object, and extraction must always occur under direct vision.

Both conventional and unconventional incisions can be used for removal of impaled foreign bodies, ensuring proximal and distal vascular control, meticulous debridement, lavage, and drainage [9, 13]. In this case, the position of the rods allowed for standard midline laparotomy and bilateral anterolateral thoracotomy. Our case included a rare third duodenal injury [17]. Bilateral thoracic impalement is uncommon [18].

With prompt multidisciplinary care, such patients can survive and recover fully, although psychological support may be necessary [1, 19].

CONCLUSION

Impalement is one of the most dramatic forms of penetrating trauma. While unstable patients rarely reach hospital alive, those who do have a good prognosis if rapidly transferred and treated. The external appearance of impalement wounds may underestimate internal injury severity. Developing countries must

strengthen workplace safety and provide adequate protective equipment for construction workers.

HIGHLIGHTS

- Multiple thoracoabdominal impalement is exceedingly rare and potentially fatal.
- Prehospital removal of impaling objects should never be attempted.
- Prompt transfer to a tertiary trauma centre and immediate surgical exploration are vital.
- Controlled extraction under direct vision prevents catastrophic haemorrhage.
- Multidisciplinary collaboration ensures optimal outcomes in complex impalement injuries.

REFERENCES

1. M.B. Alsabek *et al*. Multiple impalement injuries of the torso with two metal bars: A case report. *Annals of Medicine and Surgery* 63 (2021) 102179.
2. M.D. Horowitz, D.B. Dove, F.J. Eismont, B.A. Green, Impalement injuries, *J. Trauma* 25 (9) (1985 Sep) 914–916, <https://doi.org/10.1097/00005373-198509000-00017>.
3. Byard RW. A forensic evaluation of impalement injuries. *Med Sci Law* 2018; 58:85–92.
4. L. Ugoletti, M. Zizzo, C. Castro Ruiz, E. Pavesi, F. Biolchini, V. Annessi, Gluteal, abdominal, and thoracic multiple impalement injuries: a case report on management of a complex polytrauma, *Medicine (Baltim.)* 98 (22) (2019).) [PMC free article] [PubMed] [Google Scholar].
5. Tang X, Chen H, Chen C, *et al*. A case report of a polytrauma patient with penetrating iron rods in thorax and head. *Medicine (Baltimore)* 2018 ;97: e12376.
6. Angelopoulos S, Ioannis M, Dimitrios K, *et al*. A rare case of a transabdominal impalement after a fall from a ladder. *Int J Surg Case Rep.* 2016; 22:40-43.
7. J. D. Rawat *et al*. Penetrating Injury of Pelvis, Abdomen and Thorax in a Child with a Trident (Trishula). *APSP J Case Rep* 2013; 4: 3.
8. Thomson BN, Knight SR. Bilateral thoracoabdominal impalement: avoiding pitfalls in the management of impalement injuries [J]. *J Trauma* 2000;49(6):1135-7.
9. Raimundas Lunevicius, Adrian O’Sullivan. Unusual management of thoracoabdominal impalement injury to the right hemiliver and diaphragm. *Chinese Journal of Traumatology* 2014 ;17(1) :41-43.
10. Bill JH. Notes on arrow wounds [J]. *Am J Med Sci* 1862; 44:365-87.
11. Yavrouian RG, Mahmoud A, Matolo N. Abdominal impalement resulting in an isolated duodenal injury. *HCP Live.* 2008 [EB/OL]. [2012-06-25].
12. Berg RJ, Karamanos E, Inaba K, *et al*. The persistent diagnostic challenge of thoracoabdominal stab wounds. *J Trauma Acute Care Surg* 2014; 76:418–23.
13. Eder F, Meyer F, Huth C, *et al*. Penetrating abdominothoracic injuries: report of four impressive, spectacular and representative cases as well as their challenging surgical management [J]. *Pol Przegl Chir* 2011;83(3):117-22.
14. Sawhney C, D’souza N, Mishra B, *et al*. Management of a massive thoracoabdominal impalement: a case report [J]. *Scand J Trauma Resusc Emerg Med* 2009; 17:50.
15. Biffl WL, Leppaniemi A. Management guidelines for penetrating abdominal trauma. *World J Surg* 2015; 39:1373–80.
16. Schellenberg M, Inaba K. Critical decisions in the management of thoracic trauma. *Emerg Med Clin North Am* 2018; 36:135-47.
17. S.K. Golder, H. Friess, M. Shafighi, J.H. Kleeff, M.W. Büchler, A chair leg as the rare cause of a transabdominal impalement with duodenal and pancreatic involvement, *J. Trauma* 51 (1) (2001 Jul) 164–167, <https://doi.org/10.1097/00005373-200107000-00030>. PMID: 11468488. [PubMed] [Crossref].
18. R. Muhammad Afzal, M. Armughan, M.W. Javed, U.A. Rizvi, S. Naseem, Thoracic impalement injury: a survivor with large metallic object in-situ, *Chin. J. Traumatol.* 21 (6) (2018 Dec) 369–372, <https://doi.org/10.1016/j.cjtee.2018.08.002>. Epub 2018 Sep 20. PMID: 30348473; PMCID: PMC6354130. [PubMed] [Crossref].
19. R. Mohan, D.U. Ram, Y.S. Baba, A. Shetty, S. Bhandary. Transabdominal impalement: absence of visceral or vascular injury a rare possibility, *J. Emerg. Med.* 41 (2011) 495–498, <https://doi.org/10.1016/j.jemermed.2008.03.033> ([PubMed][CrossRef] [Google Scholar]).