


Conservative Management of Perineal Impalement Trauma with Laparoscopic Approach: Case Report

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Abstract: Perineal impalement injuries are uncommon and involve important structures that can be damaged, leading to a high risk of bleeding and affecting vital structures, which if damaged can result in significant sequelae. The approach to these injuries depends on the patient's hemodynamic stability, the trajectory of the penetrating object, and the resources available at the treatment site. In stable patients, computed tomography allows assessment of vascular injuries, involvement of adjacent structures, and whether the abdominal cavity has been breached. In cases where there is doubt regarding peritoneal violation, diagnostic laparoscopy can be employed. Currently, there are no guidelines for managing these injuries, making them a challenge for surgeons. We present a clinical case of a 17-year-old patient who suffered perineal impalement trauma with a wooden stake following a motorcycle accident, where a laparoscopic approach was chosen due to penetrating trauma associated with free abdominal fluid and uncertainty regarding peritoneal violation after imaging exams. In selected cases, minimally invasive techniques for managing impalement injuries can provide greater safety regarding vital structure involvement while being less invasive and morbid.

Keywords: Perineal Trauma, Impalement, Laparoscopy, Foreign Body, Perineorrhaphy

Introduction

Perineal impalement injuries are uncommon and involve important structures, typically resulting in complex patterns of injury and a risk of massive pelvic bleeding. In stable patients, computed tomography allows assessment of vascular injuries, involvement of adjacent structures, and whether the abdominal cavity has been breached. In cases where there is doubt regarding peritoneal violation, diagnostic laparoscopy can be employed. Some authors advocate for its use due to being less invasive, resulting in lower postoperative morbidity, shorter hospital stays, and reducing unnecessary laparotomy rates. Currently, there are no standardized treatment guidelines for these injuries, making them a challenge for surgeons [1].

Case Report

We present a clinical case of a 17-year-old patient who suffered perineal impalement trauma with a wooden stake following a motorcycle accident. On initial evaluation, she was eupneic in ambient air, hemodynamically stable, conscious, and oriented. On perineal examination, a foreign body (wooden stake)

was found impaled in the left perineal region without active local bleeding (Figure 1). Vaginal and rectal examinations revealed no abnormalities or presence of blood. Abdominal and pelvic CT showed a foreign body with an entry point in the left lateral perianal region extending from the ischioanal fossa to the pelvic space adjacent to the internal iliac vessels (no active bleeding in contrast phases), causing contralateral displacement of the urinary bladder, measuring approximately 17 cm in total length with about 12 cm of it being corporeal, consistent with impalement. A small amount of free fluid in the pelvis associated with fat stranding was noted (Figure 2). Due to penetrating trauma associated with free abdominal fluid and uncertainty regarding peritoneal violation, diagnostic laparoscopy was performed. During cavity exploration, a peritoneal bulge was observed in the left pelvic region but without cavity violation, associated with a small amount of blood (Figure 3). Gynecological speculum and anoscopy were unremarkable. The foreign body was removed under direct laparoscopic visualization (Figure 4). No active bleeding occurred after removal, and perineorrhaphy was performed.



Figure 1.

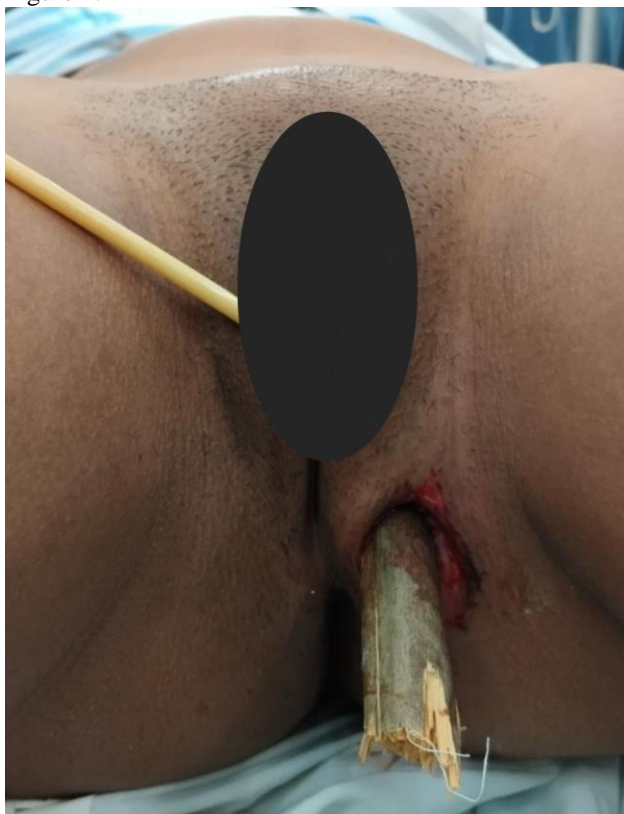


Figure 1



Figure 2



Figure 3



Figure 4.

Discussion

Perineal impalement injuries are uncommon but are associated with high morbidity and mortality. Causes include falls onto objects, physical assaults, and sexual abuse. The lethality of the injury depends on its extent and trajectory, degree of blood loss, adequate resuscitation, and control of possible local infection. Given their rarity and diverse patterns of injury, there are currently no standardized treatment guidelines. For impalement injuries, the foreign body should be left in place until the patient is adequately resuscitated and transferred to the operating room [2].

Every trauma patient arriving at the emergency department should initially be managed according to the ATLS protocol and investigated with imaging studies. The pelvic space is anatomically restricted and contains numerous structures, making it highly

vulnerable to acquiring injuries with potential significant sequelae, with studies reporting up to an 85% chance [3].

In recent decades, the management of patients with penetrating abdominal trauma has significantly changed, from mandatory surgical exploration to non-operative algorithms. Clinical experiences and studies have shown that not all penetrating abdominal wounds from sharp objects penetrate the peritoneum, with approximately only half of them doing so. Moreover, even if they breach the peritoneum, only about 20-40% of sharp object wounds cause significant injury. These observations led to the development of non-operative algorithms for treating penetrating abdominal trauma, which have been effective. Impalement, however, is an uncommon type of penetrating trauma, and due to its rarity, there are no accepted protocols for treating these injuries. Thus, the best therapeutic approach should be tailored to the patient's condition and clinical status, as well as the individual patterns of the injury [1].

Alongside advancements in diagnostic modalities (ultrasound, computed tomography, diagnostic laparoscopy), non-operative management of penetrating abdominal trauma has become routine in most trauma centers for hemodynamically stable patients. Opinions on the use of diagnostic laparoscopy are divergent in the literature; some authors suggest its use when there is evidence of peritoneal violation due to being less invasive,

resulting in lower postoperative morbidity, shorter hospital stays, and reducing unnecessary laparotomy rates from 60% to 0-11%. Other authors argue that observation with serial clinical evaluation is cheaper and equally effective, especially in asymptomatic patients [1].

Conclusion

Perineal impalement injuries constitute a rare and potentially morbid trauma with the possibility of severe complications. In selected cases, minimally invasive techniques for managing impalement injuries can provide greater safety regarding vital structure involvement while being less invasive and morbid. We present a clinical case where the use of laparoscopy excluded intra-abdominal structure involvement, which had not been confirmed with imaging exams, thereby avoiding unnecessary invasive measures.

References

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