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Case Report

Traumatic abdominal wall hernia and bowel perforation leading to shock: a case report

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ABSTRACT

Traumatic abdominal wall hernia (TAWH) is a rare clinical entity resulting from blunt force trauma that disrupts the abdominal wall muscles and fascia, leading to the protrusion of intra-abdominal contents without skin penetration. It accounts for approximately 0.07% of all abdominal trauma cases and often presents diagnostic challenges due to its rarity and association with other injuries. We present a case of a 66-year-old male who presented with a TAWH and small bowel perforation after being struck by a bull. He exhibited hemodynamic instability and abdominal tenderness. Imaging revealed a strangulated hernia. Surgical exploration found a 5 cm abdominal wall defect with herniated, gangrenous small bowel, with jejunal perforation. The affected bowel segment was resected, and the abdominal wall was repaired. The patient stabilized postoperatively and was discharged on day 14. TAWH requires a high index of suspicion for diagnosis, especially in the presence of blunt abdominal trauma. Immediate surgical intervention is often necessary to prevent complications such as bowel strangulation and peritonitis. This case underscores the importance of early recognition and timely surgical management to improve outcomes in patients with TAWH complicated by bowel perforation. Early diagnosis and prompt surgical intervention are crucial in managing TAWH, particularly when accompanied by bowel perforation. This case highlights the need for vigilance and rapid response in emergency settings to mitigate the significant morbidity and potential mortality associated with this rare condition.

Keywords: TAWH, Jejunal perforation, Shock, Emergency laparotomy, Early surgical intervention

INTRODUCTION

A traumatic abdominal wall hernia (TAWH) occurs when the abdominal wall muscles and fascia are disrupted, causing intra-abdominal contents to protrude, without any skin breach or prior surgical intervention in that area.[1] The occurrence of acute post-traumatic hernia is rare, estimated at 0.07%, despite the high number of abdominal trauma cases seen in emergency departments.[4] TAWH were first reported by Selby in 1906.[3] Deceleration forces from seat belt injuries or falls are the most common causes of TAWH, with less frequent causes including low-energy blunt injuries from charging animals, or motorcycle or bicycle handlebars.[2] Severe TAWHs often involve concomitant injuries to internal organs alongside damage to the abdominal wall.[5] Because of its infrequent occurrence and complex presentation alongside other distracting injuries, this condition is often overlooked, resulting in delayed or missed diagnosis.

We will be presenting a case of a 66-year-old male who presented with a traumatic abdominal wall hernia associated with a small bowel perforation

CASE REPORT

A 66-year-old male presented to the emergency department with alleged history of hit by bull 12 hours back. The animal struck him with its horns on his lower abdomen, just to the left of the midline. On examination, patient was hemodynamically unstable (blood pressure 80/50 mmHg, heart rate 118 BPM). The patient was pale,

diaphoretic, and in obvious distress. A visible, ill-defined swelling over left iliac region was seen (Figure 1).

Figure 1: Swelling in left iliac region.

On palpation, there was generalised abdominal tenderness and guarding with maximum tenderness over the swelling. The swelling was irreducible and cough impulse was absent. There was no associated head, chest, pelvic, or limb injury. Immediate resuscitation with intravenous fluids and blood products was done. Broad-spectrum antibiotics were administered and analgesia provided for pain management. Laboratory investigations revealed haemoglobin: 9 g/dL, white cell count: 15,000 cells/µL and serum lactate: 4 mmol/L. Focused assessment with sonography for trauma (FAST) was negative. Ultrasound abdomen showed herniation of gut loops in left iliac fossa. The gut loops appear thickened with no peristalsis and no significant vascularity. A diagnosis of strangulated post traumatic abdominal wall hernia was made and patient was taken up for surgery immediately. A midline laparotomy was performed. An irregular defect measuring around 5 cm found involving abdominal muscles and peritoneum (Figure 2) with herniation of small bowel loops which appeared gangrenous. A perforation in jejunum, approximately 60 cm from duodeno-jejunal flexure was present measuring around 2 cm (Figure 3) and a 2 cm tear in mesentery was seen (Figure 4). Herniated bowel reduced, and perforated segment was resected with primary jejuno-jejunal anastomosis performed. Abdominal wall repaired primarily. Haemostasis achieved and drain was placed.

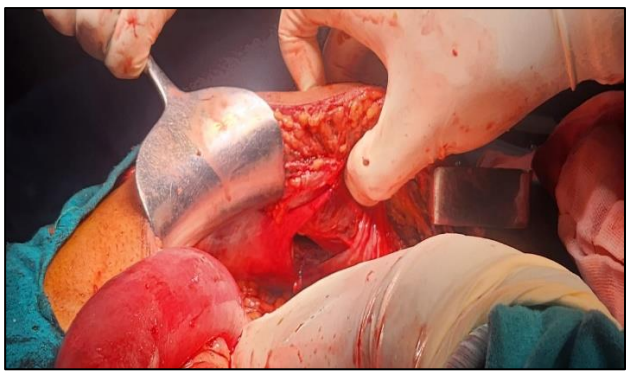

Figure 2: Defect in abdominal wall.

Figure 3: Perforation of small bowel.

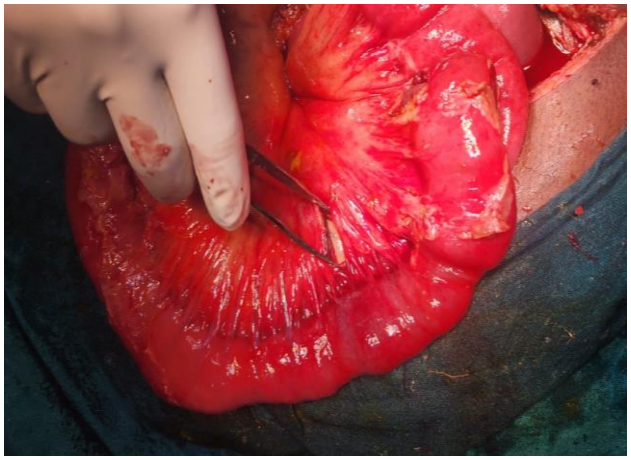

Figure 4: Tear in mesentery of small bowel.

Post operatively, the patient was admitted to the intensive care unit for close monitoring. Continued intravenous fluids, blood transfusion, and broad-spectrum antibiotics were given. The patient gradually stabilized hemodynamically postoperatively with gradual improvement in haemoglobin levels and reduction in white cell count.

Patient was discharged on postoperative day 14 with instructions for follow-up in the surgical OPD.

DISCUSSION

A TAWH occurs when there is a disruption of the abdominal wall muscles and fascia, resulting in the protrusion of intra-abdominal contents, without penetrating the skin or previous surgical intervention in that region.[1] It is caused by a sudden impact of blunt force that is not strong enough to penetrate the skin but is sufficient to disrupt the fascia and muscle.[6] The tangential forces cause the abdominal wall muscles and fascia to rupture, leading to subcutaneous herniation of the abdominal viscera, particularly bowel loops, through the

defect. Despite this, the overlying skin remains intact owing to its elasticity.[2] Dennis et al devised a grading system using CT imaging to categorize TAWH based on the extent of injury to the abdominal wall.[7] Details of this classification can be found in Table 1.

Table 1: TAWH grading system.

Grade of TAWH	Description
I	Contusion of subcutaneous tissue
II	Hematoma of abdominal wall
III	Single abdominal wall muscle layer disruption
IV	Complete abdominal wall muscle disruption
V	Complete disruption with herniation of intrabdominal contents
VI	Herniation with evisceration of abdominal contents

Numerous mechanisms are believed to cause traumatic abdominal wall hernias. Among these, bicycle handlebar injuries, particularly in children, are considered the most common.[6] Wood et al proposed a classification of these mechanisms into three types: (1) small abdominal wall defects resulting from low-energy trauma like bicycle handlebar injuries, (2) larger abdominal wall defects caused by high-energy injuries such as motor vehicle accidents, and (3) intra-abdominal herniation of the bowel due to deceleration injuries.[8]

Diagnosing TAWH necessitates a thorough physical examination and a heightened sense of suspicion. The predominant clinical feature during examination typically involves abdominal pain accompanied by a tender bulge in the abdominal wall at the location of the traumatic hernia.[2] The main consideration in the differential diagnosis is typically a rectus sheath hematoma.[11] TAWH is seldom isolated and frequently coexists with associated intra-abdominal injuries in 25% to 79% of patients.[9] Conventional radiology and barium contrast films have limited utility and are rarely employed in the diagnosis of TAWH. Ultrasound, although convenient for bedside use, faces challenges in distinguishing between bowel loops and hematoma, as both can appear hyperechoic.[10] However, ultrasound plays a crucial role in diagnosing associated lesions, particularly as techniques like FAST and E-FAST (Extended FAST) have become global standards for identifying trauma-related injuries, especially in cases of multiple traumas.[5] CT scanning is regarded as the most accurate diagnostic tool for identifying TAWH and detecting associated intra-abdominal injuries.[6] There is ongoing debate regarding the optimal timing for surgical exploration: immediate versus delayed. Delayed exploration and delayed diagnosis can lead to complications such as bowel strangulation and difficulties with excessive tension during primary closure of the defect.[2,11,12] The risk of bowel strangulation and incarceration ranges from 10% to 25%.[2] Immediate exploration and repair, however, are generally considered the preferred approach in treating TAWH.[6,11]

CONCLUSION

This case report underscores the critical importance of early diagnosis and prompt surgical intervention in managing TAWH, particularly when complicated by bowel perforation. TAWH, though rare, poses significant risks, including shock and peritonitis, which can be life-threatening if not addressed swiftly. In this case, the 66-year-old male patient's positive outcome was primarily due to timely resuscitation, appropriate imaging, and immediate surgical repair. This case highlights the need for high clinical suspicion and readiness to perform emergency surgery in patients with blunt abdominal trauma presenting with signs of shock. Early intervention can significantly reduce morbidity and mortality, emphasizing the importance of rapid and coordinated care in emergency settings.

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