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AN ESOTERIC CASE OF TRAUMATIC ABDOMINAL WALL HERNIA: A CASE REPORT

Surgery

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ABSTRACT

Traumatic abdominal wall hernia (TAWH) is an infrequent complication of blunt trauma abdomen. It follows a sudden increase in intra-abdominal pressure due to sudden tangential searing force to the abdominal wall causing rupture of musculoaponeurotic layer with an intact overlying skin. 1 We discuss here the case of a 25 yr. old male patient, victim of fall from tractor while driving presenting with pain in the abdomen. He showed tenderness and guarding with abrasions and bruises of left lower quadrant of abdomen along with left side of forehead. The following investigations of X-ray chest PA, CT abdomen with contrast (IV) and CT head were made. The patient was admitted to the surgical ICU following counsel for emergency explorative laparotomy. There is a wide variation in the presentation and the management of TAWH due to distinct etiological settings. Hence the clinical diagnosis is usually not straightforward and often TAWH can be an incidental finding during emergency explorative surgery and radiological investigations for blunt trauma abdomen. 2 Due to absence of proper management protocol patient-tailored case-to-case management is the best preference.

KEYWORDS

Case Report, Blunt Trauma Abdomen, Traumatic Abdominal Wall Hernia (TAWH)

INTRODUCTION

TAWH is defined as "herniation through disrupted musculature and fascia, associated with adequate trauma, without skin penetration and no evidence of a prior hernia defect at the site of injury". [3] Shelby first reported it about a century ago. [4] A large fraction are seen in children particularly as 'handlebar hernia'. [4] Among adults, due to variable etiological presentation the diagnosis is arduous, with RTA[5] being the most common preceding event. Typically it is seen in lower part of the abdomen due to weaker parietal wall and more elastic skin. [6-8] Here we present the case of a 25-year-old gentleman with TAWH caused by fall from a running tractor resulting in multiple injuries including an extensive traumatic abdominal wall hernia.

CASE REPORT

Presenting the case of a 25-year-old male, Surendra Singh from Bhilwara, Rajasthan (India), a farmer by occupation who was involved in a road traffic accident resulting from fall from a tractor while driving on 21/6/18 at about 3pm. The patient was taken to a local hospital in Devgarh from where he was referred to Geetanjali Medical College and Hospital, Udaipur. The patient arrived in emergency of our hospital at about 9:15 pm and was admitted to the surgical ICU. He was assessed according to the normal advanced trauma life support (ATLS) protocol. He was conscious and well oriented to time and place, well built and nourished. The Glasgow Coma Scale was 15(E4 V5 M6). The preliminary examination showed swelling over the lower abdomen, with bruises and abrasions and extensive ecchymosis. The abdomen was tender with guarding. He also had bruises and abrasions over left side of forehead. Vitals signs included BP =136/78 mm Hg, pulse= 97/min, SpO2 = 97%, respiratory sounds B/L AEBS.

After complete examination the following investigations were carried out i.e. chest x-ray PA view, x-ray pelvis, CECT abdomen pelvis with IV Contrast, and NCCT head. The patient was haemodynamically stable and the diagnosis of TAWH was confirmed by CECT abdomen. Which showed a defect of approximately 9cm in the rectus abdominis muscle along with anterior rectus sheath, through which bowel loops were herniating out. Few air foci were noted in the subcutaneous plane of anterior abdominal wall. Rest all was normal.

Following the investigations, an emergency explorative laparotomy was planned with midline incision. There was a large tear in the rectus sheath around 10 cm in length, with herniation of small intestinal perforated loop present anterior to anterior rectus sheath with gross contamination. There were multiple mesenteric tears in the perforated loop as well as distal to it. Rest all solid and hollow viscera were normal.

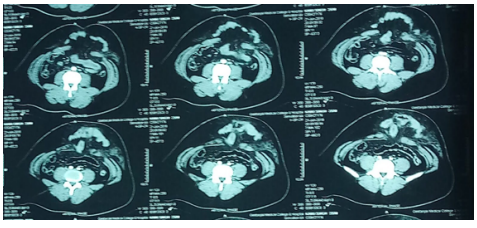

FIGURE 1: CECT abdomen showing a defect of approximately 9cm in the rectus abdominis muscle along with anterior rectus sheath, through which bowel loops were herniating out.

Considering the size of perforation and condition of perforated loop, resection anastomosis with mesenteric tear repair and abdominal wall reconstruction was done. Two closed suction drains in abdominal wall and one pelvic drain were placed. The patient was stable post-operatively.

He was discharged after 10 days with stable vitals, normal diet and normal bladder and bowel pattern. He was called for a follow-up after 1 week. The follow-up showed a healing skin incision with no signs of infection.

DISCUSSION

Traumatic abdominal wall hernia (TAWH) is a particularly sporadic form of the hernia that is caused by disruption of the abdominal wall musculature and fascia (while the skin is still intact), and bowel and abdominal organ herniation following blunt abdominal trauma. [9]

TABLE 1 The definitions and historical diagnostic criteria proposed by different authors for diagnosis of TAWH. (9)

Source, y	Proposed diagnostic criteria	Critical viewpoints
McWhorter,[10] 1939	Absence of hernia before trauma	Apart from history taking, it is difficult to prove
	History of adequate trauma that could have caused the hernia	—
	Early appearance of hernia after trauma	Delayed presentation of TAWH has been reported[9]
	Presence of severe enough symptoms and persistence of pain at the hernia site causing patient to present within the first 24 h after trauma	Delayed presentation of TAWH has been reported, and some cases may have a subtle subclinical initial presentation[9]
	Presence and degree of prostration	—
Clain,[11] 1964	Hernia follows localized blunt trauma	—
	Immediate appearance	—
	Absence of skin penetration	Some authors argue that it is not necessary[14]
	Persisting signs of trauma when presenting	Delayed presentation of TAWH has been reported[9]
Malangoni and Condon,[12] 1983	Bowel herniation through disruption of musculature and fascia	—
	Absence of skin penetration	Skin integrity may not stay intact depending on mechanism
	No evidence of previous hernia defect	—
	Absence of peritoneal sac	Some authors have reported presence of peritoneal sac[14]
Damschen *et al*[13] 1994	Bowel herniation through disruption of musculature and fascia	—
	Absence of skin penetration	Skin integrity may not stay intact, depending on mechanism
	No evidence of previous hernia defect	Apart from history taking, it is difficult to prove
Liasis *et al*[14] 2013; Moreno-Egea *et al*[15] 2007	History of injury to the abdominal wall	—
	Absence of hernia in the injured area before trauma	Apart from history taking, it is difficult to prove

TAWH has been mostly reported in the lower abdomen rather than the upper abdomen, because of the presence of natural orifices in the lower abdomen (inguinal canal), the general weakness of the abdominal wall around this area, and increased intra-abdominal pressure during injuries, just as seen in our patient. [9]

Wood et al.[10] attempted to classify these mechanisms into three types, namely:

1) Small lower quadrant defects such as handlebar injuries,
2) Larger abdominal wall defects such as motor accidents; and
3) Intra-abdominal herniation such as a deceleration injury.

With the widespread use of computed tomography (CT) in the initial assessment of trauma patients, a simpler, CT-based grading system (table 2) has been developed to define different degrees of abdominal wall disruption .[11]

TABLE 2

Abdominal wall disruption grade definitions.

Abdominal wall (AW) injury grade	Definition
I	Subcutaneous tissue contusion
II	AW muscle haematoma
III	Single AW muscle disruption
IV	Complete AW muscle disruption
V	Complete AW muscle disruption with herniation of abdominal contents
VI	Complete AW disruption with evisceration

According to this grading system, the patient's injury presented in our report would be classified as abdominal wall injury grade V.

In the presence of injuries that demand immediate exploratory laparotomy, intraoperative evaluation of the abdominal wall would be the most accurate way to evaluate for a possible TAWH. In cases of delayed presentation, multi–detector row CT and magnetic resonance imaging of the abdominal wall have a high accuracy for the evaluation of the abdominal wall.[12,13]

Factors affecting the timing (early or delayed) and the type (primary or prosthetic, open or laparoscopic) of the repair include the following:

1. The size of the abdominal wall defect,
2. The timing of its diagnosis,
3. The presence of associated intra- and extra-abdominal lesions,
4. With the advent of minimal invasive procedures, the surgeon's expertise in laparoscopic surgery. [2]

Optimal management of TAWH should be customized based on time of presentation, injury severity score, patient's condition and hemodynamic stability, associated abdominal visceral injuries, size of the abdominal wall defect and the risk of incarceration, and presence of abdominal contamination and concurrent hollow viscus injuries. In case the trauma patient is stable and the size of the hernia is small, with the visceral organs protruding through the defect, exploratory laparotomy/laparoscopy should be performed on an urgent basis to prevent possible visceral incarceration. [9]

When concurrent abdominal visceral injuries coincide with TAWH, the verdict for a simultaneous hernia repair depends on the size of the orifice and the risk of incarceration; the presence of abdominal contamination and hollow viscus injuries; the ability to perform a tension-free primary repair; the requirement for use of the mesh; and the availability of the biologic meshes. [9]

Although the presence of a hollow viscus injury and contaminated surgical field was once considered an absolute contraindication for using mesh, there are more recent publications advocating the use of biologic mesh as a good alternative in such cases. [14,15] Despite the safety of biologic mesh in these situations, the long-term durability seems to be less favorable. [15]

Hence in management of the patient we opted to not use mesh closure in lieu of presence of gross contamination and unavailability of biological mesh.

Although midline incision for an exploratory laparotomy in the immediate post trauma setting is the universal approach because it warrants good exposure for assessment and possible repair of the intra-abdominal injuries, in the delayed repair of the TAWH and in the absence of concurrent intra-abdominal injuries, local incision and exploration can also be performed. [9]

CONCLUSION

TAWH is a multifaceted injury, which makes its management challenging since no single methodology is all encompassing. Precise and timely diagnosis is crucial which allows proper planning for method and timing of the repair.[16] Following blunt abdominal trauma, particularly high-velocity injuries, a high degree of suspicion must be reserved for parietal wall swellings, as missed hernias in this setting have a high likelihood of strangulation. [17]

Because of the high incidence of other associated intra-abdominal injuries, early exploration and repair through a midline incision is advocated. Adequate debridement and solid repair of fascial planes with non-absorbable sutures are required to prevent recurrence. [10] Since complications due to incarceration or strangulation may occur, delayed or secondary repair is not recommended. [1] Hence, patient specific management plans needs to be made in TAWH cases.

CONFLICT OF INTREST STATEMENT

The authors have no conflict of interest.

ETHICS APPROVAL

The authors have obtained ethical approval from ethics committee at Geetanjali Medical College And Hospital, Udaipur, Rajasthan (India) prior to submitting the manuscript for publication.

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