

“Traumatic Abdominal Wall Hernia - A Rare Case Report and Review of Literature”

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Abstract

INTRODUCTION: Traumatic abdominal wall hernias (TAWHs) are a rare clinical entity that can be difficult to diagnose and treat. There is no fixed protocol on management of TAWH due to its low incidence and complex concomitant injury patterns .TAWHs are more common in children (handlebar hernias).The clinical diagnosis is not usually straightforward and the hernia is often discovered by imaging studies or during surgical exploration for intra-abdominal injuries.

CASE REPORT: In this article,we discuss the management of a 50 year old male who was involved in a road traffic accident.On evaluation at our medical college hospital trauma centre,he was diagnosed with TAWH.Diagnostic difficulties,imaging modalities and different management options for TAWH will be discussed.

DISCUSSION: The timing and type of the surgical repair of TAWH depends upon the time of presentation,hemodynamic stability of the patient,associated abdominal visceral injuries,size of the defect,risk of incarceration, and presence of abdominal contamination and concurrent hollow viscus injuries.

CONCLUSION: Following blunt trauma to abdomen,particularly high-velocity injuries,a high index of suspicion must be reserved for abdominal wall swellings,as TAWH is often missed at the time of presentation.Late diagnosis often have a high risk of incarceration and bowel strangulation.CT scan is the best aid to diagnosis.Management of each case needs to be individualized based on many factors.

Key Words: blunt injury,abdominal wall,hernia,traumatic wall defect,primary repair,mesh repair.

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I. Introduction

Traumatic abdominal wall hernias can occur after a high or low-velocity impact of abdominal wall against blunt objects that results in disruption of abdominal musculature and fascia causing abdominal organs and bowel to herniate through the defect without skin penetration and no evidence of pre-existing hernia at the injury site.The prevalence of TAWHs in blunt trauma patients seen at a designated trauma center is approximately 1%.Owing to the rare incidence and complex nature of this condition,it is not possible to plan randomized control trials for optimal surgical management.Since the first case report by Shelby in 1906,multiple case reports and case series have been reported in medical literature.Herein,we report the case of a 50-year-old male patient who had high-velocity blunt trauma to abdomen,following which he was diagnosed with traumatic abdominal wall hernia.Careful physical examination and Computed tomography(CT) enabled early diagnosis and treatment.Considerations in clinical and radiological diagnosis and surgical management based on our experience are discussed.

II. Case Report

A 50-year-old,well-built male,with no significant past medical history,was involved in a high-velocity road traffic accident,while driving a two-wheeler hit by a car,following which he fell over a stone.He arrived to the emergency department at our hospital in a stable condition.He was assessed along the lines of Advanced Trauma Life Support(ATLS) protocol.On primary assessment,the patient had multiple injuries with Glasgow Coma Scale score of 15 and the vitals were within normal limits.The patient complained of abdominal pain and inability to use his left lower limb.Upon evaluation,the patient had following injuries-bruises and abrasions with swelling in the epigastric region(Fig.1),abrasions over lateral aspect of left thigh with swelling and deformity in the proximal thigh.The examination,otherwise,showed a soft abdomen with mild tenderness over epigastric region,the swelling in the epigastric region showed cough impulse.X-ray both hip with thigh showed **intertrochanteric fracture** of left femur for which Thomas splint was applied.CT scan of abdomen was taken which revealed a **defect**

in anterior abdominal wall in the epigastric region measuring 3.5*3.0 cm with surrounding fat stranding and inflammatory changes and content being omentum and small bowel close to the defect(Fig.2).There was no free air/free fluid in the peritoneal cavity and the solid organs were found to be normal in the CT abdomen.



Fig.1: Clinical picture showing epigastric swelling after blunt trauma.

Fig.2: CT abdomen showing defect in the abdominal wall with surrounding inflammatory changes.

Routine blood investigations were normal and the patient was taken for emergency exploratory laparotomy in view of risk of bowel incarceration. Laparotomy showed a midline anterior abdominal wall defect measuring 4*3 cm(Fig.3) with omentum as content and there was noticeable disruption of musculature and fascia of abdominal wall at the site of injury(Fig.4). Intra-abdominal organs were unremarkable and we planned for primary anatomical repair of the defect. TAWH was repaired primarily with a drain placed in subcutaneous plane. Post-operative period was uneventful and he was advised to have regular follow-up. Patient did not show any recurrence or complications in the 8 month period after TAWH repair.



Fig.3: Laparotomy showing TAWH.

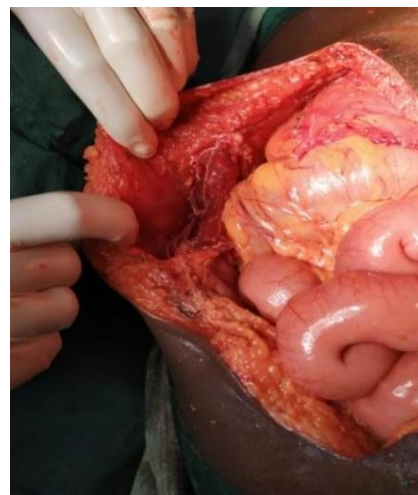


Fig.4: Intra-op image showing disruption of muscle and fascia

III. Discussion

The diagnosis of TAWH is a challenge, and cases of TAWH may go undiagnosed for a long period of time after trauma. Different diagnostic criteria for TAWH have been proposed in the trauma literature. The proposed diagnostic criteria were either complex or inconclusive. The history of abdominal wall trauma and the absence of hernia prior to trauma are the only two factors that need to be considered. TAWH has been reported in pediatric patients as well. A common mechanism of trauma in this group of patients is bicycle handlebar injury. An unique feature of TAWH in the pediatric patients is the fact that in the absence of internal organ injuries, and depending on the size of the hernia, it can successfully be managed conservatively. 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, TAWH has been mostly reported in the lower abdomen rather than the upper abdomen. The superior and inferior lumbar triangles are also prone to herniation.

Abdominal CT scan is widely used in the initial assessment of trauma patients, and most of the cases with TAWH are diagnosed using this modality. FAST has become an essential part of the initial evaluation for trauma patients. Although FAST is only designed to evaluate trauma patients for the presence of free fluid (blood) in the pelvis, pericardium, and abdomen (perihepatic and perisplenic spaces), it is possible that during the FAST examination TAWH may become apparent. If and when needed, contrast radiography such as barium studies and magnetic resonance imaging can also be performed. However, since the sensitivity and specificity of the CT are quite high, it is now the gold standard in the diagnosis of intra-abdominal injuries including hernias. CT images show the anatomy of the detached muscles, contents of the sac, and associated injuries, besides differentiating them from hematomas or abscess.

Dennis et al. described a new grading system by using CT. All scans were specifically reviewed for the presence of abdominal wall injury and graded according to the following system:

GRADE 1	subcutaneous tissue contusion
GRADE 2	abdominal wall muscle hematoma
GRADE 3	single AW muscle disruption
GRADE 4	complete abdominal wall muscle disruption
GRADE 5	complete AW muscle disruption with herniation of abdominal contents
GRADE 6	complete AW muscle disruption and evisceration

In the presence of injuries that warrant immediate exploratory laparotomy, intraoperative evaluation of the abdominal wall would be the most accurate way to evaluate for a possible TAWH. Timing of the surgical repair of TAWH is very much dependent on the presence of associated injuries. Stabilization of the patient is the priority in the trauma setting and is an indication for a delay in TAWH repair. In the setting where the trauma patient is stable and the size of the abdominal wall defect based on the CT evaluation seems to be small, with the visceral organs protruding through the abdominal wall (i.e., the current case), exploratory laparotomy and exploration of the TAWH should be done as soon as possible to prevent any possible visceral incarceration. 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 defect
2. the risk of incarceration
3. the presence or absence of abdominal contamination and hollow viscus injuries
4. the ability to perform tension-free primary repair
5. the need for prosthetic mesh.

The use of mesh in the emergency setting of initial exploratory laparotomy is a double-edged sword and is controversial. In the emergency setting, the increased risk of infection by using mesh should be weighed against the benefits of reduced recurrence rate in such cases. In the current case we elected to repair the defect primarily without using mesh. The size of the defect was not large and it was feasible to do a primary repair without tension on the suture line. Successful laparoscopic repair of the TAWH has been reported both in adult and pediatric trauma patients in the literature. The patient's instability seems to be a relative contraindication for laparoscopic approach. In the absence of instability, the laparoscopic approach is a matter of surgeon's laparoscopic skills.

In cases with a large abdominal wall defect, the risk of bowel incarceration is minimal. In such cases

primary TAWH repair without the use of mesh is impossible (because of large defect size) and the repair procedure can be postponed for an elective delayed setting. Another important reason for delayed repair is the fact that the hernia sack may develop at a later period, which makes it easier to find the muscular margins, facilitating the design and use of the mesh system. However, sometimes, the defect may enlarge with time, and muscles undergo disuse atrophy; thus, primary approximation may be difficult. Rarely, repair is complicated by the need to have fixation of mesh to bony landmarks.

IV. Conclusion

Traumatic abdominal wall hernia is uncommon and seems to be underrepresented in the medical literature. Diagnosis of TAWH is challenging and requires a high level of suspicion. There are reported cases where the diagnosis of TAWH has been delayed for several years. There is currently no consensus on the optimal management of TAWH. Optimal management of TAWH should be individualized 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.

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