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Case Report

Parietal wall post-traumatic hernia with multiple injuries: A rare case report

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ABSTRACT

Traumatic abdominal wall hernia (TAWH) is a rare entity. Most of the cases occur in children, following an injury from the bicycle handlebar. In adults, it usually results from road traffic accidents (RTA). The diagnosis may often be established with physical examination alone. Conventional radiology, computerized tomography, and ultrasound have also proven useful. Due to the high incidence of other associated intra-abdominal injuries, early exploration and repair through a midline incision are advocated. Adequate debridement and solid repair of fascial planes with non-absorbable sutures are required to prevent recurrence. We present a case of TAWH following RTA managed by delayed repair without mesh.

Key words: *Delayed repair, Giant hernia, Mesh repair, Parietal swelling, Post-traumatic, Surgical repair, Traumatic abdominal wall hernia*

Traumatic disruption of the abdominal wall is very rare and is caused by blunt trauma to abdomen, with only about 50 reports worldwide, and only one from India [1]. Not surprisingly, many cases have been reported in children, given their weaker parietal wall and more elastic skin [2-4]. The diagnosis is rarely straightforward, and management can vary substantially due to differences in presentation [5]. Traumatic abdominal wall hernia (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." TAWH is diagnosed on presentation with contrast-enhanced computed tomography (CT) of the abdomen, and most authors advocate immediate laparotomy in view of the high incidence of intra-abdominal injuries. We report such a case in 1.5-year-old child as it is very rare to see blunt trauma abdomen in this age with multiple injuries.

CASE REPORT

A 1.5-year-old female child presented to the emergency with a history of road traffic accident (hit by a car while walking on road), with a complaint of pain over the pelvis and left hand with diffuse abdominal pain. There was no history of loss of consciousness, vomiting, respiratory distress, or ear nose and throat bleed. On examination, the child was pale and was in shock (pulse - 140/min and blood pressure - 70/40 mmHg), and Glasgow coma scale was 11/15. Tenderness and swelling were present over left forearm due to fracture radius and ulna left upper limb. Initial management was done by intravenous normal saline bolus, followed by blood transfusion, pain relief, and stabilization of forearm bones. Her routine blood investigations were within normal limits except hemoglobin was 6.5 g/dl and blood was given to correct initial traumatic shock. Skiagram left upper limb was suggestive of fracture of both radius and ulna (Fig. 1).

On abdominal examination, tenderness was present over the right hypochondrium with swelling (8 × 7) cm, and impulse was present on crying. There was a palpable defect in the epigastrium extending into the right hypochondrium in the parietal muscle layer, suggesting tear of underlying musculature. There was laceration in the right hypochondrium and epigastrium with contusions. Pelvic compression was positive, and there was tenderness over pubic symphysis suggesting pelvic fracture. There were no signs of peritonitis or any other internal organ injury. The child was stabilized and planned for elective surgery. Skiagram pelvis showed right upper and lower pubic ramus pelvic fracture (Fig. 2).

Ultrasonography of the abdomen showed swelling in the right hypochondrium which was bulging on crying, and no obvious to injury to solid organs and no hemoperitonium was seen. CT abdomen showed a defect in the parietal wall in hypochondrium with muscular tear with herniation of small bowel and underlying liver normal. After stabilization, child was operated after 7 days of trauma. Intraoperatively, there was an oblique muscular and sheath defect extending from epigastrium up to the right hypochondrium (Fig. 3). Repair was done with non-absorbable suture after freshening the margins (Figs. 4 and 5). Her post-operative course was uneventful, and she was discharged on 5th post-operative day. On follow-up, she was doing well with no fresh problems.

DISCUSSION

Traumatic hernia of the abdominal wall is a rare injury. It is caused by trauma sufficient to disrupt fascial layers but not

Figure 1: Fracture radius and ulna

Figure 2: Fracture pubic ramus

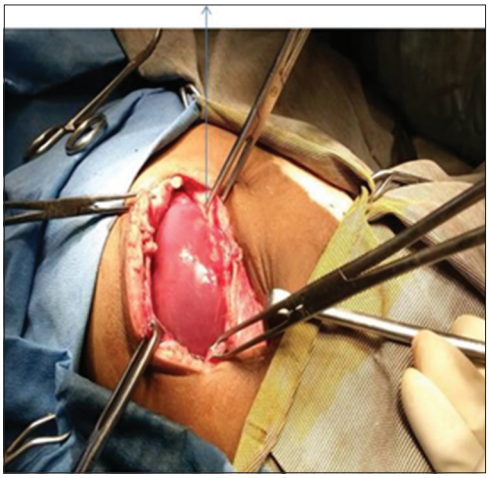

Figure 3: Post-traumatic defect in parietal wall with muscular tear

the elastic skin. Many mechanisms have been thought to cause TAWH. The most common appears to be bicycle handlebar injury, especially in children [2,4-6]. Wood et al. attempted to classify these mechanisms into three types, namely, (1) small lower quadrant defects such as a handlebar injuries, (2) larger abdominal wall defects such as motor accidents, and (3) intra-abdominal herniation such as a deceleration injury. Netto et al. [7] carried out a retrospective review of 34 patients with TAWH and made three recommendations. First, they concluded that the

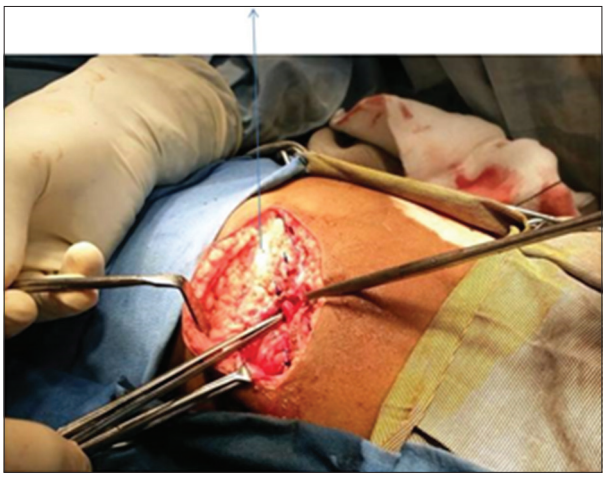

Figure 4: Repaired parietal wall

Figure 5: Post-operative 7th day

mechanism of injury should be considered when deciding on operative intervention. Second, clinically apparent hernias often have associated injuries and warrant urgent laparotomy. Finally, occult hernias may be managed expectantly.

CT scan is unequivocally the best modality for diagnosis [8-10]. It is also useful for identification of associated injuries. Recently, Matsuo et al. have also reported successful conservative management of abdominal hernia caused by handlebar injury, using a cloth corset [11]. Their decision was again aided by a CT scan which did not reveal any intra-abdominal injury. Hence, decisions with such patients are best made on an individual basis.

Both mesh repair and primary repair have been successfully performed for the treatment of traumatic hernia [2-5]. As there appears to be no consensus on this issue, one may conclude that low-velocity injuries lead to less tissue necrosis, and a mesh can be used. When high-velocity injuries are present as in motor vehicle accidents, mesh may be avoided because of the high risk of infection, unless there is greater tissue loss [5]. Treatment based on the merits of each case would again be the most prudent approach. A high index of clinical suspicion is also essential, as an accompanying hematoma often confounds the diagnosis [10].

The abdominal wall of a child has thinner musculature than that of an adult, particularly within 1st 2 years of life, providing less protection to underlying structures. The ribs are more flexible in the child, which makes them less likely to fracture. However, this increase in compliance makes them less effective at energy dissipation, and therefore, less effective at protecting the upper

abdominal structures (e.g., the spleen and the liver) [12-14]. The solid organs are comparatively larger in the children than in adult, and more surface area is exposed, making the organ more at risk for injury. Lower fat content and more elastic attachments are typical of the intra-abdominal organs in children. These characteristics reduce the amount of energy absorption and may result in increased motility and vulnerability. The child's spleen has a thicker capsule than that of the adult, yet the spleen is among the most commonly injured solid organs in blunt abdominal trauma.

In the young child, the intestine is not fully attached within the peritoneal cavity (especially the sigmoid and right colon), and this incomplete attachment is potentially making it more vulnerable to injury from sudden deceleration or abdominal compression. Bladder extends to the level of the umbilicus at birth and therefore is more exposed to a direct impact to the lower abdomen as the age increases bladder descends to its retropubic position.

CONCLUSION

Following blunt abdominal trauma, particularly high-velocity injuries, a high index of suspicion must be reserved for parietal wall swellings, as missed hernias in this setting have a high risk of strangulation. CT is the best aid to diagnosis. Management of each case needs to be individualized. High index of suspicion is required in cases of polytrauma, regarding injuries to solid organs and parietal wall and diaphragm.

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