

Traumatic Ventral Hernia: A Case Report

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ABSTRACT

A 12-year-old boy was rushed into the accident and emergency (A&E) unit of our facility following a fall from a bicycle with an associated handlebar injury to the right inguinal region. He was hemodynamically stable. Essential findings were an abrasion in the right inguinal region with an adjacent tender non-reducible swelling. The rest of the abdomen was normal. He was resuscitated and had an abdominal ultrasound done, which suggested bowel herniation, normal intra-abdominal organs, with no free fluid collection. Via a supra-inguinal incision, local exploration was done. A hyperemic loop of bowel was found in the subcutaneous tissue protruding through a 5 cm defect in the abdominal muscles, just above the internal ring. There was no mesenteric injury. The bowel was reduced with ease and the wound closed in layers; the fascia with continuous Prolene 1 suture. Post-operative recovery was uneventful. Follow-up at five years revealed no complications.

Keywords: Ventral hernia, Handlebar injury, Blunt abdominal trauma

INTRODUCTION

Traumatic ventral hernia (TVH) has been traditionally defined as “bowel or abdominal organ protrusion through a disruption of abdominal wall muscles and fascia following trauma, without skin penetration or evidence of a prior hernia at the site of injury.” Since its first description by Serby over a century ago, TVH has remained a rare disease with an incidence of 0.08%. Majority are caused by handlebar-like objects as was first described by Dimyan et al in 1980. A high index of suspicion is required to diagnose such hernias as they could easily be

passed as hematomas with disastrous consequences. Abdominal ultrasonography and CT scan help establish the diagnosis and exclude associated intra-abdominal injury. Local wound exploration and repair is feasible in the absence of positive indicators of intra-abdominal injury. This is the report of one patient that was managed without a formal laparotomy.

CASE REPORT

A 12-year-old boy was brought into the A&E with



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2 hours history of a fall from a bicycle during which he had an impact at the right side of his lower abdomen with the handlebar. There was no loss of consciousness. He experienced pains at the site of impact and later noticed an associated swelling in the area. There were no other abdominal symptoms and no history of previous abdominal hernia. The vital signs were normal. Abdominal examination revealed an inverted U-shaped abrasion in the right supra-inguinal region with an obvious 8cm x 4cm bulge that was moderately tender (Figure 1). Cough impulse and reducibility were not demonstrable due to pain/tenderness. The remaining abdomen was unremarkable. The chest and other systems were normal.

He was resuscitated with intravenous fluid and antibiotics. An emergency abdominal ultrasound showed normal intra-abdominal organs with no fluid in the peritoneal cavity. The bulge in the inguinal region was noted to contain a loop of bowel. He was prepared for local exploration under general anesthesia. Following a supra-inguinal incision over the bulge, a loop of hyperemic but viable bowel was found in the subcutaneous plane. This loop was noted to be protruding through a 5 cm defect of the anterolateral abdominal wall muscles, above and lateral to the deep inguinal ring. No mesenteric tear or hemoperitoneum. The bowel was reduced back into the peritoneal cavity without difficulty and the wound closed in layers. Fascia repair was with Prolene 1 using continuous suturing technique. Post-operative recovery was uneventful. He has been followed up now for over 5 years with no complication.

DISCUSSION

Trauma to the abdomen resulting in ventral hernia is rather an infrequent occurrence with prevalence ranging from 0.08% to 1%³, and when it occurs, might be associated with intra-abdominal organ injuries. Incidence of such injuries ranges from 25% to 79% depending on the mechanism of

injury and location of TVH among other things. However in the Handle-bar TVH, intra-abdominal organs are involved in just 10% perhaps owing to its low velocity on impact. This may explain why the index patient had no intra-abdominal organ involvement.

Diagnosis of TVH is mainly clinical and requires a high index of suspicion as the condition can easily be mistaken for a hematoma in the absence of pre-existing swelling. The delay in appropriate surgical treatment could then be catastrophic as the herniated bowel could obstruct and even strangulate. The typical signs of hernia, (i.e. cough impulse, reducibility) may not be easy to demonstrate as in the index patient because of pain and tenderness at the site of trauma. The diagnosis became obvious only after the ultrasonography. Abdominal ultrasound and computerized tomography scan have been reported as not only been useful for diagnosis of the hernia but also in the detection of intra-abdominal organ injury, defining the anatomy of the disrupted abdominal wall layers, the content of the sac, and distinguish a hernia from a hematoma or soft tissue contusion which are common differential diagnoses. In rare cases, the hernia will not be identified until at exploratory laparotomy or diagnostic laparoscopy.

Since the initial diagnostic criteria proposed by McWhorter in 1939, several authors (including Clain, Malangoni & Condon, Damschen among others) have attempted to suggest additional diagnostic criteria.^{7,12} Common to all these are the history of blunt abdominal wall trauma and the absence of hernia prior to trauma, though the former is seldom possible to validate. Other diagnostic criteria suggested though inconsistently employed include the early appearance of hernia bulge after trauma, the persistence of severe pain at the injured area, presentation within the first 24 hours, and absence of peritoneal sac.⁷ The index patient fulfilled all the above-mentioned criteria.

A traumatic ventral hernia is thought to follow the application of a sudden tangential blunt force over an area large enough to prevent skin penetration (owing to its elasticity) in conjunction with a raised

intra-abdominal pressure (as the patient braces for impact) resulting in a pressure-induced disruption of the abdominal wall muscles and fascia, consequently allowing for herniation of abdominal viscera through the defect into the subcutaneous space.⁸ This pathology has been demonstrated to be most common in the lower abdomen, perhaps due to its relative weakness from the presence of natural orifices, such as the inguinal canal.^{7,9} This was also the case in the index patient with the hernia located in the right supra-inguinal region.

The treatment of TVH is a surgical exploration with a tension-free closure of the defect. The debate has continued regarding the timing of repair, approach to repair, and the type of repair.^{7,11,12,13} The appropriate timing and approach of surgical intervention will depend on various factors including the presence of associated injuries, the size of the abdominal wall defect, presence of peritoneal contamination, the clinical status of the patient, expertise of the attending surgeon and available resources.^{7,12,15,16} Overall, timing can be immediate or delayed, the approach could be open or laparoscopic, exploratory laparotomy or local wound exploration, and the type of repair primary closure using non-absorbable suture or use of mesh.^{7,12,15,16} Irrespective of what decision is taken, the principles of surgical management are the same; adequate visualization, satisfactory debridement, removal of hematoma, and a tension-free repair.¹⁵ Establishing a standard treatment protocol though desirable will be difficult to come by considering the numerous factors to be considered. Each case must therefore be examined based on his merit and appropriately catered for.¹⁵ In the index patient, we were able to exclude associated intra-abdominal injury by meticulous clinical examinations and ultrasonography. It was also possible to confirm that the abdominal bulge contained bowel. For these reasons, local exploration was offered.

CONCLUSION

Though rare, TVH should be considered in any

patient with a tender bulge on the abdominal wall following blunt abdominal trauma. Missed diagnosis occasioned by the absence of apparent clinical signs can be minimized with the appropriate use of point-of-care abdominal ultrasonography (FAST) and abdominal computerized tomography scan. Once diagnosed, TVH should be repaired surgically if disastrous consequences of obstruction and strangulation are to be avoided

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