

Case Report

Traumatic abdominal intercostal transdiaphragmatic hernia: a case report and literature review

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ABSTRACT

Abdominal intercostal herniations are a rare entity where abdominal contents herniate through the intercostal space with or without diaphragmatic rupture. Because they are rare, there is little literature to support how they should be treated, conservatively or surgically, and if surgically, what techniques provide the best outcome. This case illustrated the potential for good recovery post-surgical repair of a traumatic intercostal hernia and suggests a guideline used to determine surgical technique.

Keywords: Trauma, Cardiothoracic surgery, General surgery, Intercostal, Hernia

INTRODUCTION

Intercostal herniation of abdominal contents are a rare occurrence and can happen as a result of trauma.¹ They are usually below the 9th intercostal space and contain a variety of organs and structures.² Symptomatic intercostal abdominal hernias should be treated surgically, but due to their rarity, no clear guidelines are available to determine the best approach.

CASE REPORT

This is a 73 years old lady admitted as a polytrauma who was involved in a single vehicle roll over as a result of unheralded syncope. She did not have a history of any intrathoracic or abdominal surgeries. She sustained multiple right sided rib fractures associated with a small pneumothorax, and with this, a herniation of intraabdominal contents via the intercostal space. Other injuries also included L2 vertebral body, multiple lumbar transverse process and right ilium fractures with a small superficial penetrating injury to her right groin.

Workup during a secondary survey included a CT head to pelvis which demonstrated an intercostal hernia at the right 8th intercostal space along with a diaphragmatic rupture. Hernial contents included the right lobe of liver, hepatic flexure of colon and mesentery. This was associated with a liver laceration of segments VI and VII.

On physical examination, there was a tender firm mass with a palpable liver edge in the right upper quadrant that was irreducible. She was briefly hypotensive, hypoxic and tachycardic but responded well to fluid resuscitation with a robust haemoglobin. There was mild respiratory distress without significant compromise requiring low flow nasal prong oxygenation.

She was subsequently transferred to a tertiary trauma centre where she underwent an open primary suture repair of diaphragmatic rupture without mesh, with surgical steel re-approximation of ribs and thoracoscopy 2 days post admission from which she has recovered well after a period in rehabilitation without signs of recurrence to date.



Figure 1: Coronal CT scan of lower chest and abdomen demonstrating herniation of liver and colon through intercostal defect.



Figure 2: Axial CT scan of abdomen demonstrating partial liver herniation of segments VI/VII associated with laceration.

DISCUSSION

Intercostal hernias are a rare occurrence.³ The mechanism by which they occur in 65% of cases is major trauma from tissue disruption while spontaneous or minor trauma hernias are thought to be associated with an underlying condition that disrupts tissue strength.⁴ Two case reports of penetrating trauma describes this similar hernia from penetrating chest injury and combat trauma.⁵ Another case report exemplifies this type of hernia associated with Ehlers-Danlos syndrome and the challenge that presents with surgical repair.⁶ The typical pattern of injury usually occurs below the 9th rib with disruption of intercostal muscle, transversus abdominis and internal oblique with the majority having caudal rib displacement.²

Because of their rarity, there is little literature to support whether they should be managed conservatively or surgically and if surgically, which technique provides the best outcome.

They can be classified several ways including aetiology, contents, anatomical location and involvement of the diaphragm but there has not been a clear unifying classification to guide operative management.⁷ The literature available are mainly case reports and nomenclature are variable in regards to the injuries and the associated muscles thereby making intraoperative techniques difficult to describe.⁸ A proposed Sheffield classification method by Gooseman et al based on sequential analysis (clinical, radiological and intra-operative) for presence of costal margin rupture, along with diaphragm rupture and intercostal rupture suggest that the operative method for fixation should address these three individual components to reduce recurrence or failure.⁸ This can be achieved with a combination of primary suture repair, mesh repair and rib plating.

Urgent surgical repair of the hernia at the time of presentation remains the recommended treatment to prevent serious complications such as ischaemia, obstruction, missed solid organ injury and chronic pain, although there have been some cases that have been reported to be managed conservatively when the patients were asymptomatic and consideration was given to their age, comorbidities and type of hernia.⁹ The recommended operative management would involve mesh repair of the diaphragmatic defect with this method showing the lowest rate of recurrence. Rib steel banding for concurrent rib fractures are a suitable method decreasing tension without the need for rib plating.¹⁰

CONCLUSION

Intercostal hernias, a rare entity, can occur through a variety of mechanisms usually as a result of trauma. These should be treated operatively when able and operative management should ideally include mesh repair of the diaphragm to reduce the rate of recurrence.

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