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Laparoscopic repair of a rare acquired abdominal intercostal hernia

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ABSTRACT

INTRODUCTION: An acquired abdominal intercostal hernia (AIH) is a very rare and sporadically reported entity. Most cases of AIH are secondary to major trauma and the treatment of choice is surgical repair.
PRESENTATION OF CASE: We present the case of a 58-year-old man who presented with a painless intercostal swelling, which started after previous penetrating trauma to the same area. Radiological assessment was done with CT scan and the hernia was repaired with a laparoscopic approach using mesh.
DISCUSSION: AIH is a rare entity and trauma has an integral role in the pathophysiology. Surgical repair is the treatment of choice, however, due to the paucity of cases, there is no established method of choice for such repair. We present the first reported case in the Caribbean, which was repaired with the laparoscopic approach.
CONCLUSION: Although AIH is a rare condition, the pathophysiology seems relatively straightforward and the use of CT scan is recommended to confirm the diagnosis. The laparoscopic approach, with all its established benefits, appears to be a safe and feasible option in its management.

1. Introduction

An acquired AIH is a very rare and sporadically reported entity, with approximately twenty reported cases in the world literature. Moreover, the role of laparoscopic management of this condition is not well defined in the literature. We present the first reported Caribbean case of an acquired AIH managed by laparoscopy.

2. Presentation of case

We present the case of a 58-year-old male patient who was stabbed in the left ninth intercostal space three years previously. This was cleaned and sutured at a local district health facility. There was no further workup at this facility as the laceration appeared to be superficial. Three months subsequently, the patient noticed a distinct bulge at the site of injury. The swelling was not painful and became larger on exertion. He presented to our surgical out patient clinic with a large, hemispherical swelling to the left flank that was approximately 8 cm × 8 cm in size (Fig. 1). The swelling was reducible, had a positive cough impulse and was non-tender. A CT scan of the abdomen confirmed a defect in the left 9th intercostal space at the anterior-lateral aspect, also revealing an 8 cm × 6 cm hypo-density below the subcutaneous tissue, suggestive of an acquired AIH containing greater omentum (Fig. 2).

The patient underwent laparoscopic repair of the hernia using 3 ports (one 12 mm port and two 5 mm ports). The pneumoperitoneum was created by way of the first port (12 mm clear port), which was inserted approximately 15 cm distal to the xyphoid sternum, just to the left of the midline, using the opti-view technique. This port was used as the camera port during the operation. Using the principle of triangulation, the other 2 ports were inserted under direct vision, and were used as the working ports. The content of the hernia was greater omentum (Fig. 3), which was reduced with the aid of ultrasonic shears for adhesiolysis (Fig. 4). The hernia defect measuring 4 cm × 2 cm (Fig. 5) was then covered with a 10 cm × 15 cm Physiomesh (Ethicon), which was secured using absorbable tacks (Fig. 6). The patient was discharged the following day, and there have been no signs of recurrence after 6 months of follow up.

3. Discussion

An intercostal hernia is an uncommon condition characterized by the protrusion of lung and/or abdominal viscera through an intercostal space defect. It generally occurs secondary to trauma or previous surgery and it can also occur spontaneously.[1,4] The term “abdominal intercostal hernia” (AIH) can be applied regardless of

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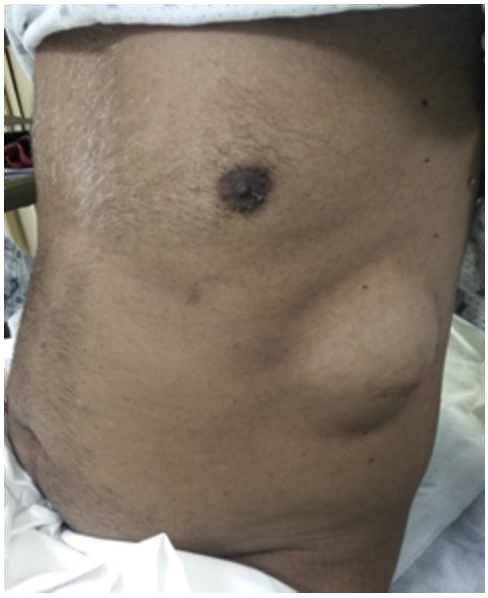

Fig. 1. Photograph showing the swelling over the left anterior-lateral chest wall.

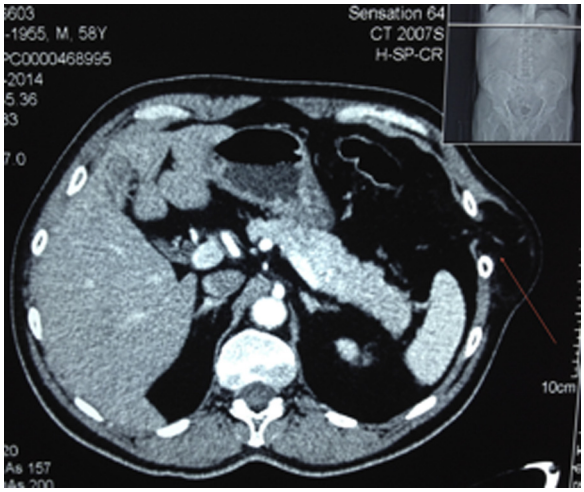

Fig. 2. Transverse section view of CT scans of the abdomen with an arrow showing the left intercostal defect, with hypo-density within the chest wall, adjacent to the defect.

whether viscera reached the intercostal space directly from the peritoneal cavity or from a transdiaphragmatic defect. However, according to Bobbio et al.,[2] the term "abdominal intercostal hernia" should be reserved for cases with no diaphragmatic injury, while those involving diaphragmatic injury should be labeled "transdiaphragmatic intercostal hernia".

A recent review of the literature by Erdas et al.[3] showed that AIH mainly developed under the 9th rib with no significant differences as to side. The number of males was about double that of females. Most cases of AIH are secondary to major trauma as in severe blunt strikes or minor trauma e.g. severe coughing in patients suffering from COPD.[4] 20% appear to be spontaneous.[4] Certain areas of the chest wall are more susceptible to herniation. Anteriorly, the chest wall is weak from the costochondral junction to the sternum because it lacks the support of the external intercostal muscle. Posteriorly, another weak point exists between the costal angle and

Fig. 3. Photograph of a view at laparoscopy, showing greater omentum within the hernia defect.

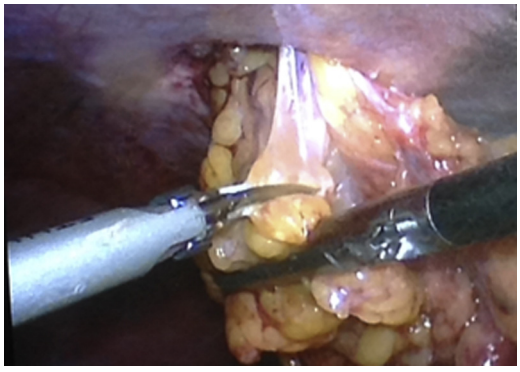

Fig. 4. Photograph of a view at laparoscopy, showing adhesiolysis being performed with ultrasonic shears.

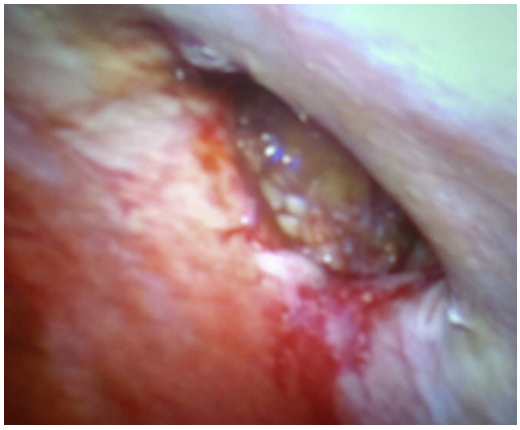

Fig. 5. Photograph of a view at laparoscopy, showing the intercostal hernia defect after reduction of its contents.

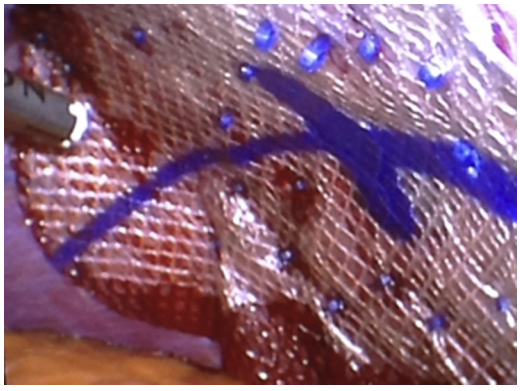

Fig. 6. Photograph of a view at laparoscopy, showing the mesh repair.

the vertebrae.[5] Connective tissue disorders such as Ehlers Danlos syndrome also predispose to weakening of the chest wall.[6]

Additional factors that may cause a hernia to develop through an intercostal space include the complete rupture of intercostal muscles and their progressive weakening, or secondary to rib fracture associated with neurovascular pedicle injury.[7] Clinical features of AIH are a large reducible swelling in the lateral aspect of the thoracic wall, associated with discomfort or pain. Symptoms may be mild and discontinuous. Symptoms usually last more than 8 months and the time interval between trauma and hospitalization may be up to 20 years.[3] This time span may reflect the need for the combination of increased intra-abdominal pressure and an inherent chest wall weakness to result in the formation of an intercostal hernia.[5] In obese patients the intercostal bulge may not be easily detectable or the hernia itself could be confused with a hematoma.[8]

CT scan is the most frequently used diagnostic tool because it confirms the diagnosis and rules out any further visceral lesions. It also allows preoperative evaluation of the hernia defect,[9] which aids in the planning of surgical repair.

Given its very rare occurrence, establishing an early diagnosis of AIH and choosing the most appropriate treatment may remain a challenge. Erdas et al. and others have reported that 15% of acquired AIH can be complicated by incarceration or strangulation of omentum, bowel or liver.[3,10] Therefore surgical repair is recommended choice of management. Conservative management is usually reserved for elderly patients with severe co-morbidities who are at high risk for surgery.

The intercostal defect can be repaired via thoracotomy, performed along the intercostal space involved, laparotomy or laparoscopy.[2] The recommended first choice technique is tension free mesh repair.[3] Given the small number of available cases it is not easy to establish the best technique. Recurrences have been observed regardless of approach and technique.[11] Compared to open procedures, laparoscopy has the advantage of being minimally invasive and allows diagnosis and treatment of other intra-peritoneal injuries also.

4. Conclusion

AIH is a very uncommon entity and a high index of suspicion must be entertained when chest swelling occurs after major or minor trauma. CT is essential to making the diagnosis and to rule out co-existing injury. Intercostal defects should be repaired surgically and can be done safely using the laparoscopic approach. Here we have the first reported case of laparoscopic management of abdominal intercostal hernia in the Caribbean.

Conflict of interest

The authors have no conflict of interest to disclose.

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-chief of this journal on request.

Author contributions

Dilip Dan is the senior author with key input in all aspects of paper. Parasram Ramraj, Verin Solomon, Malini Ramnarine and Trudy Kawal were instrumental in drafting paper and doing research. Nigel Bascombe and Vijay Naraynsingh were involved in reviewing paper.

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