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Primary abdominal intercostal hernia: Dream or clinical reality?

Michela Zanatta, Marcello Donati

Abstract

The term intercostal hernia (IH) refers to conditions where either the lung or abdominal viscera herniate through a defect in the intercostal space. Abdominal viscera can herniate through an intercostal space with (transdiaphragmatic IH) or without (abdominal IH) an associated diaphragm injury. Primary IHs are extremely rare, with only one case previously described in the literature. Here, we present the second case of a primary spontaneous abdominal intercostal hernia reported in the literature. The computed tomography scan revealed no rib fractures or diaphragm injuries, but it did reveal that the patient had two extra lumbar ribs, with the hernial defect located between the 12th and 13th right rib. Primary spontaneous IHs are extremely rare, so it could be hypothesized that they might not truly exist as a distinct clinical entity, suggesting an unrecognized cause that would classify them as acquired hernias, such as an extra pair of ribs or congenital diseases.

Keywords:

Abdominal intercostal hernias, intercostal hernias, uncommon hernias

Introduction

The term intercostal hernia (IH) refers to conditions where either the lung or abdominal viscera herniate through a defect in the intercostal space.[1,2] Abdominal IHs are extremely rare, usually resulting from thoracic wall trauma or congenital syndromes. Abdominal viscera can herniate through an intercostal space with or without an associated diaphragm injury. Bobbio *et al*.[3] categorized the first scenario as transdiaphragmatic intercostal hernia (TDIH), whereas abdominal intercostal hernia (AIH) denotes the occurrence of no diaphragmatic abnormality. To date, 42 cases of TDIH[4] and 20 cases of AIH are reported the literature.[2] All reported AIH cases involve acquired herniation of abdominal viscera, typically following trauma, chronic obstructive pulmonary disease (COPD), or congenital syndromes such as Ehlers–Danlos.[5] A unique case report describes a spontaneous occurrence of AIH in an 80-year-old man without a previous history of trauma or surgery but with bilateral inguinal hernia.[1]

Case Report

Here, we present the second case of a primary spontaneous AIH reported in the literature. A 65-year-old male patient complaining of a swelling under his right thoracic wall was referred by his family doctor to the surgical outpatient section of our hospital [Figure 1A]. His wife noticed this swelling about 2 years ago, when it was smaller. Recently, the swelling had increased in size, prompting an ultrasound and then a computed tomography (CT) scan by his family doctor. The CT scan revealed no rib fractures or diaphragm injuries, but it did show that the patient had two extra lumbar ribs (13th and 14th pair). The hernial defect was located between the 12th and 13th right rib, with an orifice measuring about 4 cm × 2 cm containing the omentum and part of the ascending colon [Figure 1B–C]. The patient's medical history included diagnoses of type

Surgical Clinic Unit, Department of Surgery and Medical-Surgical Specialties, University of Catania, Catania, Italy

Address for correspondence:
Dr. Michela Zanatta, Surgical Clinic Unit, Department of Surgery and Medical-Surgical Specialties, University of Catania, Via Santa Sofia 78, Catania 95123, Italy.
E-mail: michela.zanatta25@gmail.com

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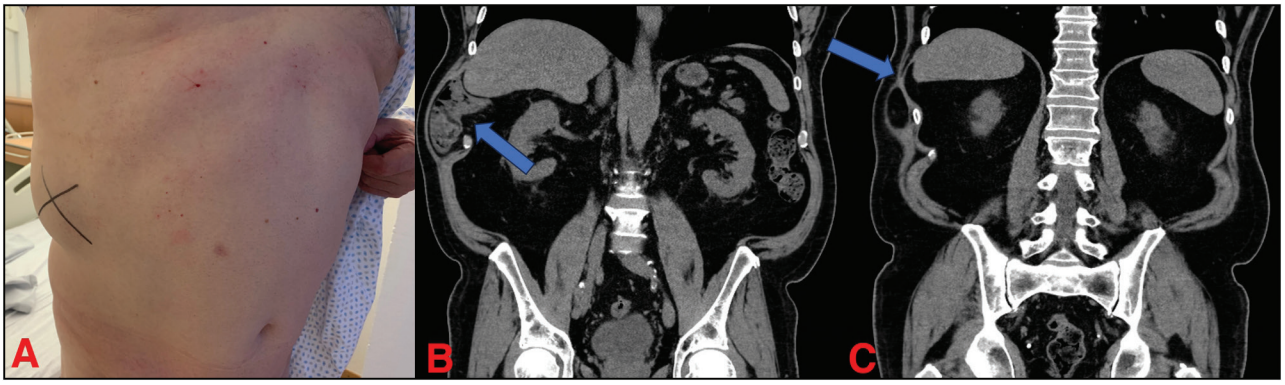

Figure 1: (A) Pre-operative figure of right-sided abdominal intercostal hernia; (B) pre-operative computed tomography (CT) scan: the blue arrow shows hernia content (omentum and part of the right colon); (C) pre-operative CT scan: the blue arrow indicates the close attachment between the hernial sac and the costodiaphragmatic recess. The two pairs of supernumerary ribs are also visible in this scan

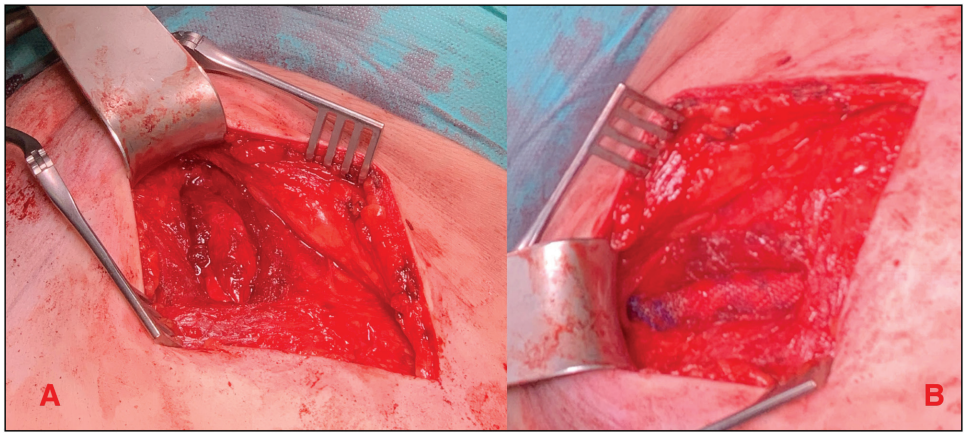

Figure 2: (A) Intra-operative picture of the isolated hernial sac. (B) Intra-operative picture of the hernia repair with a pre-peritoneal polypropylene mesh

2 diabetes mellitus, arterial hypertension, bronchial asthma, and a stroke 10 years ago. Blood tests showed a normal white cell count (6.82×10^3/mL) and slightly elevated C-reactive protein (18.59 mg/L). The patient had never had surgery or trauma and was asymptomatic, except for occasional constipation. Physical examination revealed a well-reducible, cough-expandable swelling the size of an orange, located anteriorly in the 12th intercostal space. No other hernias have been identified, even after exploring the triangles of Petit and Grynfeltt. We opted for surgical repair of the IH using an open technique, which was performed under general anesthesia due to the patient's anxiety and the hernial sac's close attachment to the right pleura. We made a transverse incision (about 5 cm) following the 12th right intercostal space, isolated the sac up to the hernial orifice, and reduced it into the abdominal cavity [Figure 2A]. During the isolation, we accidentally opened the right thoracic pleura and placed a Bülau thoracic drainage system to prevent complications. After closing the pleural defect, we repaired the hernia with a sublay-retromuscular double-layer polypropylene mesh (10 × 6 cm) with at least a 2-cm overlap on each side [Figure 2B].The patient was discharged on the second postoperative day in good condition, with no active pain and only analgesic therapy as needed. The Bülau drainage system was removed a few hours before discharge after a chest radiograph confirmed no pneumothorax or other lung complications. The patient reported no postoperative consequences from the pleural injury. Discharge was planned for the second postoperative day due to postoperative pain on the first day. The postoperative course was otherwise uneventful. We scheduled a follow-up visit on the 12th postoperative day to remove the skin stitches. Follow-up showed an unchanged general clinical condition.

Discussion

IH includes abdominal wall and thoracic hernias, characterized by a defect in one or more intercostal spaces.[3] They must be distinguished from lumbar hernias, which involve posterolateral herniation of abdominal contents through two specific anatomical spaces, the triangles of Petit and Grynfeltt, located below the ribcage.[6] Primary IHs are extremely rare, with only one case previously

described in the literature.[1] Most IHs are secondary, often post-traumatic due to rib fractures, blunt or penetrating traumas,[1,2] or related to congenital syndromes that cause tissue fragility or hyperelasticity.[5] Major or repeated minor traumas to the ribcage or thoracic wall and COPD, which causes severe coughing and recurrent sudden increases in thoracic pressure, are the most common risk factors for IH.[2,4] Other predisposing factors include collagenopathies,[5] congenital syndromes,[7,8] obesity,[1,2] or previous surgery, although in the latter case, the term incisional IH is more appropriate.[9] Congenital IHs described to date involve only lung hernias and are typically not isolated, often occurring with multiple herniation sites due to ribcage polymalformations.[7] Two isolated cases of congenital lung hernias in children are reported in the literature.[7,8] Unlu *et al*.[1] observed that IHs mostly occurred in men, were predominantly left-sided in incidence (59%), and most frequently involved the 8th to 10th ribs, with only one case described having IH below the 11th rib. The 9th intercostal space is involved in 56.75% of cases.[4] IHs are often associated with diaphragm injuries and are rarely considered as single entities.[3] AIHs are thus a subset of IHs where abdominal viscera herniate through an intercostal space defect without diaphragm injury. Erdas *et al*.[2] reviewed AIH, describing 20 cases of acquired AIH. Although AIHs are rarely reported in literature, their true incidence might be higher as they are commonly asymptomatic or minimally symptomatic.[3] Clinical and instrumental imaging are crucial for diagnosis and determining the appropriate therapeutic approach. Ours is the second published case of primary AIH, with obesity and two extra thoracic ribs as the only predisposing factors. Some rare congenital lumbar hernias are related to ribcage malformations, such as in the exceptionally rare lumbo-costo-vertebral syndrome,[10] although our literature search did not find any hernias related to extra ribs. We chose surgical intervention due to the steady growth of the mass, which could pose further risks of hernia strangulation and expansion due to negative intrathoracic pressure.[4] Primary spontaneous IHs are extremely rare, so it could be hypothesized that they might not truly exist as a distinct clinical entity, suggesting an unrecognized cause (a previous trauma the patient does not recall or latent soft tissue weakness) that would classify them as acquired hernias. In this case, it could be speculated that supernumerary ribs caused the hernia, suggesting that primary IHs may not constitute a clinical reality.

Author contributions

Concept (M.Donati), design (M. DOnati), definition of intellectual content (M. Donati), literature search (M. Zanatta), clinical studies (M. Zanatta), data acquisition (M. Zanatta), data analysis (M. Zanatta), manuscript preparation (M. Zanatta), manuscript editing (M. Zanatta and M. Donati), and manuscript review (M.Donati).

Ethical policy and Institutional Review board statement

Not applicable.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Data availability statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Not applicable.

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