Case Snippets

Transdiaphragmatic intercostal hernia due to chronic cough

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Intercostal transdiaphragmatic hernia is a rarely reported lesion. Trauma is the commonest cause. We report a 75-year-old man who presented with transdiaphragmatic intercostal hernia due to chronic cough. He recovered after surgical repair. [Indian J Gastroenterol 2006;25:92-93]

Intercostal herniation of abdominal contents through a diaphragmatic defect is a rare occurrence. Croce and Mehta coined the term intercostopleuroperitoneal hernia.¹ It has been reported following direct penetrating or blunt trauma to the lower chest or severe coughing episode.¹,² Negative intrapleural pressure allows entry of intra-abdominal viscus or omentum into the thoracic cavity. Weakening of the intercostal muscles due to direct trauma or severing of intercostal nerve bundle allows the hernial sac to expand into the subcutaneous space. Right-sided diaphragmatic hernias are uncommon, compared to the left. This is attributed to the buttressing effect of the right lobe of liver on the right hemidiaphragm.

A 75-year-old man presented with gradually increasing swelling in the right hypochondrium since 15 days. It increased on straining and decreased on lying in the lateral decubitus position. He had chronic cough with obstructive pulmonary disease since 2 years. He was a known hypertensive since 35 years on treatment and had undergone angioplasty for ischemic heart disease 7 years ago. There was no history of trauma.

Clinical examination revealed a hernia bulging between the divergent 8th and 9th ribs in the anterior axillary line. It increased on straining and was reducible with a furrow appearing between the divergent ribs. Bowel sounds were heard over it. There was another bulge in the same intercostal space in the infrascapular region with paradoxical movement. X-ray confirmed divergent ribs. CT scan showed transdiaphragmatic intercostal herniation of liver, colon and small bowel anteriorly (Fig) and subcutaneous herniation of lungs posteriorly in the same space, causing paradoxical movement.

Exploration was done through an anterolateral thoracotomy incision along the long axis of the defect. There was a defect between the 8th and 9th ribs with no evident fracture. The posterior part of incision exposed a thin fascial layer through which the pleura and the underlying lung were herniating into the subcutaneous tissue. The flat fibers of the internal and external oblique muscles appeared to form the anterior wall of this part of the intercostal hernia. The torn margins of the intercostal muscles flanking the 8th and 9th ribs formed the superior and inferior walls of this hernia. The transthoracic fascia and pleura formed the sac. The sac was opened to enter the pleural cavity.

Exploration revealed that the diaphragm had torn away from its normal anterior costal attachment at the 8th and 9th ribs and had retracted, creating a defect. Through this defect the liver, colon, omentum and small bowel entered the pleural cavity and bulged anteriorly through the weakened intercostal muscles into the subcutaneous tissue. The lung was reposited in the thorax and bowel in the abdomen. The diaphragmatic defect was closed and the 8th and 9th ribs were brought together using simple interrupted nylon sutures. Anteriorly a polypropylene mesh was put to reinforce the intercostal muscles. A chest tube was put in the right pleural cavity and a suction drain was kept over the mesh. The incision was closed in layers.

The patient had an uneventful postoperative course. Three months later he had no symptoms and was disease-free.

Croce and Mehta¹ described a patient who had spontaneous lateral detachment of the right hemidiaphragm from the chest wall along with ninth segmental rib fracture. The resultant hernia sac was partially bound by peritoneum and produced a pleuroperitoneal hernia. There have been several isolated reports of penetrating trauma that produced similar hernias.²⁻³ In our case chronic cough was the etiological factor.

The formation of transdiaphragmatic intercostal hernia requires a chain of anatomical events. First the force of violent coughing tears the intercostal muscles and may even fracture an overlying rib in debilitated patients. At the same time, the costal insertion of the adjacent diaphragm gets torn away. Negative intrathoracic pressure draws the intra-abdominal viscera into the chest cavity where it eventually comes to rest in the space created by the torn muscles.⁴⁻⁵ Herniations through the chest wall are associated with increases in intrathoracic pressure.

Footnote:

Figure: CT scan showing intercostal herniation of lung (left) and herniation of small bowel and colon.
and have a predilection for areas of weakness in the chest wall. These areas occur anteriorly from the costochondral junction to the sternum because of the absence of external intercostal muscles and posteriorly from the costal angle to the vertebra as a result of the absence of internal intercostal muscles.\(^4\)

The diagnosis can be made with a palpable defect in the thoracic wall through which a reducible soft tissue mass appears. The contents can be ascertained by observing that the containing lung varies in size paradoxically with respiration and is increased by Valsalva maneuver.\(^2\) An increase in hernia size with inspiration and a decrease with expiration occur when there is a diaphragmatic injury with prolapse of abdominal viscera into the thorax and out through the chest wall.\(^2\) The chest radiograph may reveal divergent ribs with bowel gas shadows beyond the confines of the abdominal cavity. CT scan confirms the diagnosis.\(^5\)

Surgery can be performed by an incision over the hernial sac, which can be extended as a thoracoabdominal incision if adhesions are present. Diaphragmatic injuries can be repaired by primary closure or by a prosthetic mesh. Intercostal muscles are usually attenuated and need reinforcement by a prosthetic mesh.

**References**


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Received June 8, 2005. Accepted August 12, 2005