INTRA-THORACIC AND INTRA-ABDO-MINAL PERFORATION OF THE COLON IN TRAUMATIC DIAPHRAGMATIC

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Abstract

A case of incarcerated diaphragmatic hernia is present. Incarceration of the colon occurred five months following the original injury, causing intrapleural perforation. In addition, unsuspected free perforation of the colon was found in the peritoneal cavity.

Introduction

Traumatic diaphragmatic hernia continues to be a challenging problem for diagnosis and management. The purpose of this paper is to report a case of delayed traumatic diaphragmatic hernia with strangulation and perforation of the colon loop in the left hemithorax, and simultaneous perforation of the cecum in the abdomen.

REPORT OF A CASE

November ,7, 1916-First Admission: This 34 year old white male was admitted to the hospital following an automobile accident. The patient sustained blunt injuries to the face, chest, abdomen and lower extremities. During five weeks of hospitalization, the patient underwent treatment for pulmonary contusion, cerebral concussion, non-operative management of flail chest on the left side, fracture of the left ilium, and closed reduction of fractures of the small bones of the right hand. Due to persistent haziness of the left lower lung field, a barium swallow of the upper gastrointestinal tract was performed. In addition, a barium enema was carried out. Both these examinations were normal. The patient was discharged fully ambulatory and with a functional gastrointestinal tract. The chest x-ray at the time of discharge was unremarkable.

April 30, 1977-Second Admission: After having been lost to follow up for four months, the patient presented himself in the emergency room, with complaints of shortness of breath of one week's duration. According to the patient, the shortness of breath was insidious in its onset and had been slowly and progressively increasing in severity. At the time of examination in the emergency room, the patient was found to be grossly orthopneic. There was visible peripheral cyanosis. No breath sounds could be heard on the left side, and there was complete dullness on percussion. The trachea was shifted to the right side. Abdominal examination showed moderated amount of distention. Bowel Sounds were hypoactive.

Chest x-ray (Fig. 1)

Fig. 1(*a*)

Fig. 1(*a and b*) PA and lateral chest x-ray, showing distended loops of colon in left hemithorax, causing gross mediastinal shift to right side.

showed distended bowel loops in the left hemithorax, with marked shift of the mediastinum to the right side. There was also the possibility of a localized pneumothorax in the upper part of the chest. An emergency barium enema was carried out, which showed abrupt termination of barium column at the splenic flexure (Fig. 2).

Fig. 2. Barium enema showing abrupt termination of barium column at the splenic flexure.

The patient underwent exploratory thoracotomy, which revealed the transverse colon, stomach and spleen to be herniated into the left hemithorax. The herniated colon was grossly gangrenous and had perforated. There was free fecal material in the pleural cavity. The lung was collapsed and was covered by a thick pleural peel.

Resection of the herniated transverse loop of colon was carried out through the chest. DeMartle clamps were placed on the bowel ends and the bowel ends were dropped into the peritoneal cavity. The defect in the diaphragm was delineated. It measured six and one-half inches in length, over the dome of the diaphragm.

It was repaired in two layers using 3-0 ethiilex interrupted, figure-of-eight sutures. Adequate expansion

was achieved after decortication of the left lung. The pleural cavity was lavaged with saline, and after insertion of the chest tubes for drainage, the pleural cavity was closed in layers.
The abdomen was then opened through a midline incision. Free fecal material was found in the right lower quadrant. A free perforation was found at the cecum, on its posterior surface, along the right colonic gutter. A right colectomy was carried out. The continuity of the bowel was not restored and the ileum was brought out as an ileostomy stoma, and the descending colon was brought out as a mucous fistula. The abdomen was closed after thorough irrigation and adequate drainage.
The patient was placed on parenteral Clindamycin (Upjohn Company) and Gentamicin (Schering Corporation). The patient made a good recovery, and three months later, underwent closure of the colostomies. He has done well to this date.

Discussion

Traumatic diaphragmatic hernia has been known to be caused by blunt and penetrating injuries at the thoraco-abdominal region. Blunt trauma includes falls, crush injury to the chest, and deceleration force in an automobile accident (Strug et al., 1974).
The acute rupture of the diaphragm is usually very obvious, but many times the perforation and the resultant herniation of the intraabdominal structures may not become evident for days, months, or even years (Mansour 1974; Grodsinsky and Ponka, 1975). A high index of suspicion for such lesions usually can lead one to prompt surgical treatment, and thus avoidance of a catastrophy.
Stomach, colon, and spleen are the frequent organs to herniate into the pleural cavity, with decreasing frequency noted for omentum, small bowel and liver (Strug et al., 1974; Grodsinsky and Ponka, 1975). The strangulating diaphragmatic hernias have been considered as a thoraco-abdominal complex, rather than a distinctive thoracic entity (Carter et al., 1971). It is not unusual for the thoracic part of the complex to overshadow the abdominal symptoms. In the patient presented above, this was indeed the case. The acute respiratory distress, because of herniated abdominal viscera in the left pleural cavity, overshadowed the abdominal findings.
Depending upon the competency of the ileocecal valve, a patient with obstructing colonic hernia may not develop the full-blown picture of large bowel obstruction. However, in the event of a competent valve the right colon appears to take the brunt of colonic obstruction. The free perforation of the cecum was, we believe, due to competent ileocecal valve, in the face of herniation and obstruction of the transverse colon. Some reports in the literature have alluded to the presence of peritonitis as one of the symptom complex in strangulated diaphragmatic-hernias, but no mention of the intra-abdominal perforation of the colon has been made (Carter et al., 1971; Strug et al., 1974).
In acute diaphragmatic hernias an abdominal approach is preferred by many, but in chronic hernias a thoracotomy approach is mandatory. The accepted mode of managing such a patient with strangulated colon has been to excise the colon through the chest incision and do a defunc-tioning colostomy. Since the defunctioning colostomy requires a small abdominal incision, it is worthwhile to do an exploration of the abdomen, to rule out any intra-abdominal or retroperitoneal perforations. In the event of a colonic perforation, a concomitant right colectomy and a defunc-tional ileostomy is indicated. Wide drainage of the pleural, as well as the peritoneal cavities and adequate antibiotic coverage, is mandatory.

References

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