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CASE REPORT

TRAUMATIC DIAPHRAGMATIC HERNIA PRESENTING AS ACUTE SURGICAL EMERGENCY: A CASE REPORT WITH REVIEW OF LITERATURE

***,[1]Dr. Divish Saxena, [2]Dr. Murtaza Akhtar, [3]Dr. Mrinal Tandon and [4]Dr. Akshay Bangde**

Department of Surgery, NKP Salve Institute of Medical Sciences, Digdoh Hills, Nagpur, Maharashtra, India

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ABSTRACT

With increasing number of road traffic accidents involving either blunt or penetrating injury to abdomen, a high degree of suspicion for traumatic diaphragmatic tear should always be kept in mind. Patients with acute tear in diaphragm along with herniation of abdominal contents often present with strangulated bowel and respiratory distress thereby increasing both morbidity and mortality. We report such a case of road traffic accident with acute diaphragmatic tear in left hemi diaphragm with herniation and strangulation of transverse colon resulting in gangrene and perforation causing faecothorax, acute respiratory distress and septicemia who was managed surgically with an immediate exploratory laparotomy with closure of diaphragmatic defect and left thoracic drain and resection of gangrenous bowel and colo-colic anastomosis with proximal divergent ileostomy. The patient was discharged satisfactorily after ileostomy closure.

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INTRODUCTION

A diaphragmatic injury must be suspected in either blunt or penetrating injuries to abdomen especially those occurring due to road traffic accidents. Sennertus, in 1941 reported the first case of traumatic diaphragmatic hernia while performing an autopsy (Blaivas *et al.,* 1853). The first ante mortem diagnosis of diaphragmatic hernia was given by Bowditch (Bowditch, 1853). The first successful repair of diaphragmatic tear is being credited to Riolfi in 1886 (Hedblom, 1925). As suggested by Turhank *et al*, motor vehicle accidents are now becoming the prime cause of blunt diaphragmatic injuries (Turhan *et al.,* 2008; Cameron, 2008). Acute diaphragmatic tear with herniation and gangrene of bowel with faecothorax causes high mortality and morbidity (Seelig, 1999). Chest X-ray and spiral CT thorax and abdomen are very sensitive in detecting left sided diaphragmatic hernia (Sliker, 2006; Desir, 2012). The preferred approach for treating diaphragmatic hernia is by doing a formal midline laparotomy as it can detect associated visceral injuries also. Acute diaphragmatic tear should be repaired with a non- absorbable monofilament suture or with a polypropylene mesh if a larger defect is encountered (Turhan *et al.,* 2008).

Corresponding author: Dr. Divish Saxena
Department of Surgery, NKP Salve Institute of Medical Sciences, Digdoh Hills, Nagpur, Maharashtra, India

CASE REPORT

A 58 years old male patient presented to emergency room with a history of road traffic accident when he was riding a two wheeler and met with a head on collision with a speeding truck 2 days back. On admission patient was conscious, oriented but having breathlessness and pain in abdomen. His pulse rate was 120/min, respiratory rate of 23/min, Blood Pressure of 110/70 mm of Hg and SpO2 of 90%. Patient's x ray chest was suggestive of presence of bowel loops in left hemithorax (Figure 1) and CT thorax was also suggestive of left diaphragmatic hernia, fracture of left clavicle and 4th to 9th ribs and surgical emphysema. After stabilizing the vitals of the patient, he was subjected for diagnostic laparoscopy. It was suggestive of loop of transverse colon herniating into left hemithorax with a longitudinal tear along taenia coli (Figure 2). Due to pneumoperitoneum and increased intrathoracic pressure patient's SpO2 started to fall, the laparoscopic procedure was converted to a midline laparotomy. The findings on laparotomy were transverse colon, part of stomach, spleen and loops of jejunum found to be herniating through the diaphragmatic tear. About 10 cms of transverse colon was found to be gangrenous with perforation causing faecothorax (Figure 3). Around 300 ml of thick faecopurulent material aspirated from left hemithorax. Diaphragmatic rent of 4 x 4 cms was present in left dome of diaphragm (Figure 4). The diaphragmatic rent was closed with interrupted polypropylene suture after giving

through saline wash to left hemithorax and putting in an intercostal drain.

Figure 1. X- ray Chest showing presence of bowel loops in left hemithorax and fracture of ribs on left side

Figure 2. Laparoscopic view of herniated transverse colon through left hemidiaphragm along with longitudinal serosal tear

Figure 3. Figure showing gangrenous segment of transverse colon with perforation

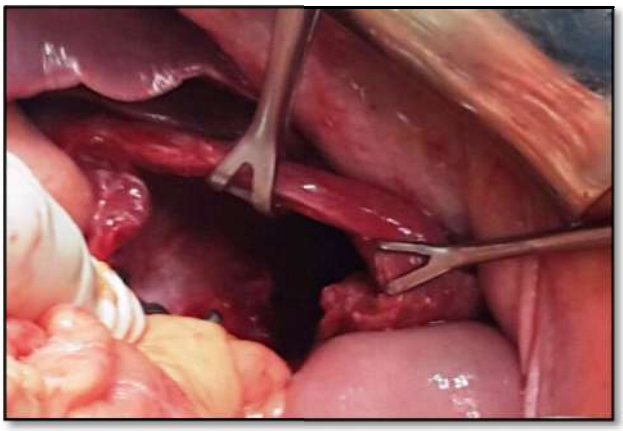

Figure 4. Diaphragmatic rent of 4 x 4 centimetres

The gangrenous part of transverse colon was resected and colo-colic anastomosis done with a proximal divergent ileostomy. Post operative period was uneventful except for purulent drain from left intercostal drain for almost 15 days. Ileostomy closure was done after 2 months and patient was discharged satisfactorily.

DISCUSSION

Injuries to the diaphragm occur either due to penetrating or blunt injuries to abdomen and thorax. These are now becoming relatively more common with increase in number of motor vehicular accidents. Around 0.8-1.6% of patients with blunt trauma have diaphragmatic tear with herniation of abdominal contents (Hedblom, 1925; Turhan *et al.,* 2008). Left sided diaphragmatic herniation is more common accounting for around 68% as right hemidiaphragm is guarded by liver (Hanna *et al.,* 2008). The diagnosis may be delayed in those patients who are on ventilatory support as positive pressure ventilation prevents herniation (Sharma and 2001).The literature reports incidence of missed diaphragmatic injuries to be around 12 % to 66% in patients who are asymptomatic on admission (Guth *et al.,* 1995). Diaphragmatic hernia causes various pathophysiological changes in circulatory and respiratory system due to loss of diaphragmatic function, compression of lungs, mediastinal shift and decreased venous return to heart. The patients present with respiratory distress, pain in abdomen and vomiting. Clinically, there is a reduced breath sound in left hemithorax and sometimes gurgling bowel sounds may be heard. Blind placement of a chest tube in undiagnosed case of diaphragmatic hernia may result in visceral injuries. Chest X-ray is very sensitive in diagnosis of left sided diaphragmatic hernia and it may show elevation of left hemidiaphragm, distorted margins of diaphragm and presence of abdominal contents in thorax with or without constriction i.e. “collar sign” (Sliker, 2006).

However, Murray *et al*. reported 62% of asymptomatic patients may have a normal chest radiograph (Murray *et al.,* 1998). The sensitivity of spiral CT thorax and abdomen in detecting diaphragmatic hernia is reported to be in the range of 14% to 82% (Desir, 2012).In our patient X-ray was diagnostic of left sided diaphragmatic hernia. CT was done in our patient to detect other visceral injuries. Laparotomy is usually the preferred approach for surgical management as it can also

detect associated visceral injuries (Hanna *et al.,* 2008). Herniated bowel loops can undergo strangulation, gangrene and perforation causing faecothorax thereby increasing both morbidity and mortality (Seelig *et al.,* 1999; Kelly *et al.,* 2008). Our patient had faecothorax on exploration due to gangrene and perforation of transverse colon. The repair of diaphragmatic tear should be done with a non-absorbable suture material either interrupted or continuous technique (Hanna *et al.,* 2008; Matsevych, 2008). A synthetic mesh is recommended for a larger diaphragmatic defect (Hanna *et al.,* 2008; Matsevych, 2008).

Conclusion

Diaphragmatic injuries should be considered in either blunt or penetrating injuries to chest and abdomen resulting due to vehicular accidents specially in patients having respiratory distress and classical X ray chest or CT findings of diaphragmatic hernia. A word of caution for putting in an intercostal drain as it may result in iatrogenic injury to the herniated viscera. A formal midline laparotomy should be the preferred approach for exploration. After reduction of hernia contents the diaphragmatic rent is to be repaired with a nonabsorbable suture material in case of small defect and with a synthetic mesh if the defect is large.

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