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Case Report

Surgery Section

Gastro Pleural Fistula: A Rare Entity Presenting as a Complication of Empyema Thoracis Following Stab Injury to the Chest

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ABSTRACT

Gastro pleural fistula is an infrequently seen lesion. Here, a case of stab injury to the chest that led to the formation of a gastro pleural fistula has been presented. An intercostal drainage (ICD) tube was inserted after haemothorax was identified on this chest X-ray. The patient noticed the presence of ingested food particles at the site of ICD tube twelve days following the stab injury. The diagnosis of gastro pleural fistula was subsequently confirmed after a contrast enhanced computed tomography (CECT) of the chest and abdomen. Intraoperatively, a defect in the left hemi diaphragm with a fistulous tract between stomach and the left pleural cavity was identified. Closure of the gastric fundal perforation, excision of the fistulous tract and repair of the diaphragmatic defect was done.

Keywords: Gastric fundal perforation, Hemidiaphragm, Intercostal drainage, Pleural cavity

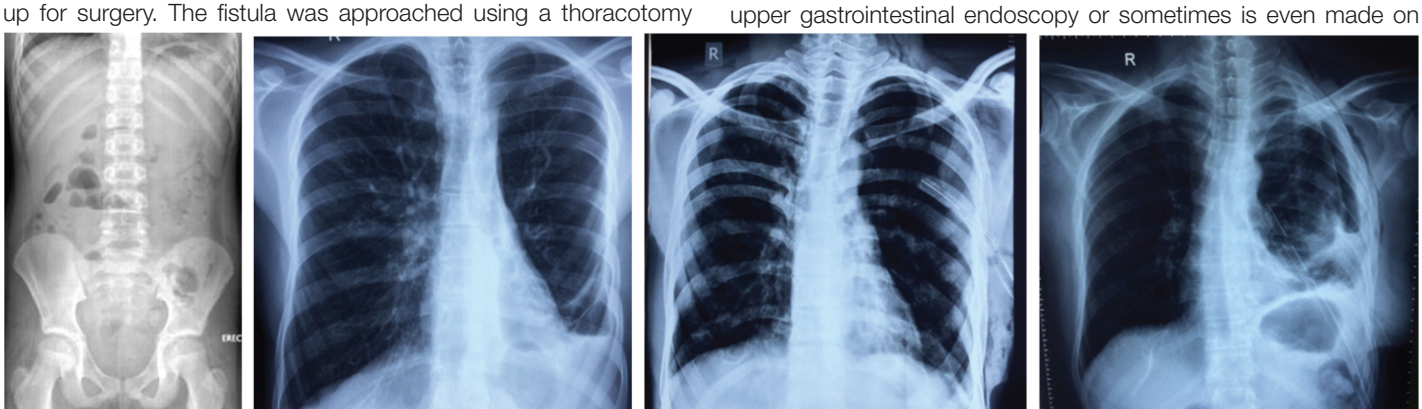
CASE REPORT

A 20-year-old male presented to the casualty following a stab injury to the chest. On arrival, patient's vitals were stable and a stab wound was identified in the left seventh intercostal space along the anterior axillary line. There was no abdominal tenderness or any other feature suggestive of peritoneal irritation or organ injury clinically. An antero-posterior X-ray of the chest, erect X-ray of the abdomen and ultrasound of the abdomen were performed. The sonogram and erect X-ray of the abdomen [Table/Fig-1] were unremarkable however patient had haemothorax [Table/Fig-2] for which an ICD tube was inserted in the left fifth intercostal space along the mid axillary line under aseptic precautions. The ICD was placed using clinical judgment and later its positioning was confirmed by a post-procedure chest X-ray [Table/Fig-3]. Patient developed empyema thoracis six days after the ICD insertion and subsequently was started on higher antibiotics. The ICD was also repositioned for better drainage of the collection. This procedure was also done using clinical judgment and following the repositioning a post-procedure chest X-ray was taken [Table/Fig-4]. On the twelfth day following injury, patient noticed ingested food articles from his wound. A diagnosis of gastro pleural fistula was confirmed following a contrast enhanced computed tomogram of the chest and abdomen [Table/Fig-5]. The patient's nutritional status was improved and was taken up for surgery. The fistula was approached using a thoracotomy incision. Intraoperatively, a 2 cm defect in the left hemi diaphragm with a fistulous tract between the stomach and left pleural cavity was identified [Table/Fig-6]. Closure of the gastric fundal perforation, excision of the fistulous tract and repair of the diaphragmatic defect was done. Postoperatively the ICD was removed on the fifth day as there was minimal collection and the patient was discharged a week after the surgery and has been on regular follow-up.

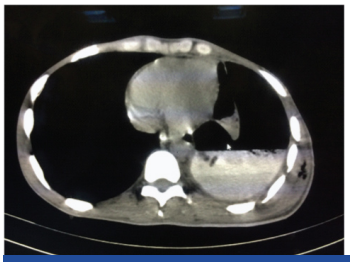
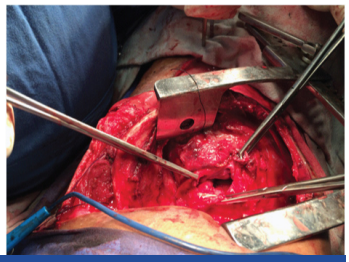
DISCUSSION

Markowitz and Herter first described Gastro pleural fistula in 1960 [1]. Most authors describe this condition as a rare or an unusual one requiring a very high index of suspicion. Various causes for this condition have been described in literature such as intrathoracic perforation of stomach in hiatal hernia, traumatic diaphragmatic hernia with perforation of stomach and intraperitoneal gastric perforation with erosion of sub phrenic abscess via diaphragm, multiple ICD tube insertions [1,2], esophageal rupture either spontaneously or iatrogenically (endoscopy or nasogastric tube passage), gastric malignancy such as lymphomas, trans diaphragmatic gastric penetration after an empyema thoracis [1-4], following pneumonectomy, oesophagogastrectomy and splenectomy [5,6].

The diagnosis of this condition might require contrast radiology, upper gastrointestinal endoscopy or sometimes is even made on



[Table/Fig-1]: Erect X-ray abdomen showing no abdominal pathology and opacity in the left pleural cavity
[Table/Fig-2]: Chest X-ray showing haemothorax on the left side
[Table/Fig-3]: Chest X-ray post ICD insertion on the left side
[Table/Fig-4]: Follow up X-ray after changing the ICD position for better drainage showing a loculated empyema on the left side

[Table/Fig-5]: Contrast enhanced CT of the chest showing the contrast-fluid sign diagnostic of a Gastro pleural fistula
[Table/Fig-6]: On thoracotomy, a 2cm defect in the diaphragm and a gastric fundal perforation was identified and repaired

exploratory laparotomy or a diagnostic laparoscopy. A few useful bedside tests such as testing the pleural fluid for pH or bile salts and using markers such as methylene blue or oral contrast agents and their aspiration from the pleural cavity can be done in severely ill patients [1,3,7].

The cause for the formation of a gastro pleural fistula in this case will have to be attributed to one of the three causes which are, penetrating stab injury causing diaphragmatic injury and the perforation of the stomach, an iatrogenically caused fistula while inserting the ICD tube or empyema thoracis eroding through the diaphragm and perforating the fundus of the stomach. Had the patient developed the fistula at the time of injury, he would have presented much earlier. An iatrogenic cause was ruled out as the ICD insertion and repositioning were done under extreme care and immediate post procedure chest X-rays were taken to confirm its position and rule out diaphragmatic injuries. The patient would have also had symptoms immediately after the procedure if there was any diaphragmatic injury and a gastric fundal perforation. Since the patient had pyothorax and presented with symptoms of gastro pleural fistula 12 days following the injury, it was believed that the fistula formed secondary to pus eroding through the diaphragm and perforating the stomach. Another case described by Arun et al., [2], where a gastro pleural fistula could have occurred after empyema thoracis in a seven year-old boy with suspected Chronic Granulomatous Disease.

Initial management of such a condition will have to be conservative which includes measures such as ICD, use of antibiotics according to culture and sensitivity of the pus sample, building up the nutrition of the patient by either oral feeds, surgery for enteral feeding or total parenteral nutrition in rare cases. Most cases will require surgical intervention. Both abdominal and thoracic approaches have been described in the management of this condition. However, there is no ideal approach described in literature as this condition is very rare and large studies have not been done. Hsieh HC et al., [8] in their publication describe that the abdominal approach is superior to the thoracotomy approach. The authors opine that approach should be individualized as per case and on the surgeon's preference. In an acute setting with suspicion of an abdominal visceral injury, laparotomy would be preferred. In cases with no abdominal injuries, and patients with empyema who will require decortication of the fibrosed pleura, a thoracotomy would seem superior. The authors preferred the thoracotomy approach for the same reasons. This case where the fistula formed after empyema thoracis that occurred secondary to an infected ICD site following a stab injury is extremely rare and has not been reported in literature yet.

CONCLUSION

The authors would like to emphasize that gastro pleural fistula is a potential complication that should be borne in mind in cases of stab injuries to the chest, persistently draining empyema thoracis or even while inserting an ICD tube as these are situations that are routinely faced in emergencies. The diagnosis of this condition should be made without delay and only with antibiotics, nutritional support and surgical management can the morbidity and almost certain mortality associated with this entity be avoided.

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