Case 16985

Non-traumatic Tension Gastrothorax, Rare But Life Threatening
Published on 27.08.2020

DOI: 10.35100/eurorad/case.16985
ISSN: 1563-4086
Section: Chest imaging
Area of Interest: Stomach (incl. Oesophagus) Thorax
Imaging Technique: CT
Imaging Technique: Digital radiography
Case Type: Clinical Cases
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Patient: 85 years, female

Clinical History:
85-year-old female brought with complaints of shortness of breath and for last 6 days. Laboratory results showed leucocytosis with deranged renal function test. Patient has solitary right kidney since birth. Chest X-Ray was done but inconclusive. Then, non-contrast CT chest and upper abdomen was done for further evaluation.

Imaging Findings:
Chest X-Ray PA view (Figure 1a) shows a huge round gas collection in the lower part of right hemithorax. Right diaphragm is not clearly delineated. There is opacification of the rest of the right hemithorax with combination of pleural effusion, consolidation and atelectasis. Follow up X-Ray (Figure 1b) after one day showed increased size of the gas collection. Non-contrast CT chest and abdomen shows markedly widened oesophageal hiatus with herniation of stomach and transverse colon in to right hemithorax (Figure 2a). Stomach is distended, rotated along its long axis with greater curvature displaced superiorly and lesser curvature inferior and medially with abrupt narrowing at antro-pyloric region. Gastro-esophageal junction is proximally displaced to the level of carina with kinking and fluid filled distended esophagus (Figure 2b). The distended stomach is causing compressive atelectasis of right middle and lower lobe, contralateral mediastinal shift, compression of right atrium and inferior vena cava (Figure 3). Collapse consolidation of right upper lobe with massive right sided pleural effusion is seen(Figure 4).

Patient passed away shortly after.

Discussion:
Tension Gastrothorax is a rare condition but life threatening. Incidence of spontaneous gastrothorax is not clearly reported. Term tension gastrothorax first appeared in literature in 1984 as a complication of rupture of diaphragm [1]. It is always associated with diaphragmatic hernia. Diaphragmatic hernia can be congenital or acquired. The weak points through which the abdominal organs can enter the thorax are the natural hiatuses that allow important structures to pass between thorax and abdomen or at the points of failure of embryonic fusion of diaphragm through the foramen of Morgagni or foramen of Bochdalek. Spontaneously acquired hernia in elderly people most often involves esophageal hiatus can occur through these hiatuses. The precipitating factors can be Valsalva maneuver, exercise related to weight lifting or even childbirth [2,3]. Most common organs migrating through the hernia are the stomach and colon [4,5].
In our case, there is spontaneous herniation of the stomach into the right thoracic cavity through the oesophageal hiatus. It is associated with organo-axial volvulus of the stomach. Most of the literature has described this event commonly on the left side. The reason behind it is probably the buffering effect of the liver on the right hemidiaphragm. When the whole stomach suddenly rises up to the thorax, tension gastrothorax may develop especially when the stomach is grossly distended by the air, fluid or food particles through the one-way valve mechanism caused by the angulation of the gastro-oesophageal junction combined with gastric outlet obstruction. This may lead to sudden lung collapse followed by hypoxyxia and pulmonary hypertension. Severe hemodynamic compromise precipitates even further with mediastinal shift and compression of cardiac chambers [5,6]. Chest radiography is useful in the initial surveillance. It helps to differentiate with the tension pneumothorax which could be difficult to differentiate clinically because of the severe respiratory distress and reduced breath sounds. In tension pneumothorax, diaphragm is depressed flattened and clearly defined but in tension gastrothorax it is hard to delineate. Barium swallow is useful for diagnosis in stable patients. CT chest is the most reliable modality for the diagnosis. It can clearly delineate the diaphragmatic outline, extent of the defect, contents of the hernia as well as relationship with the adjacent organs [7].

Tension gastrothorax is a very rare but potentially fatal condition. Immediate diagnosis is warranted and should be followed by emergency decompression of the distended stomach through nasogastric tube if possible and later with surgical reduction of the herniated content into the abdomen and diaphragmatic repair.

**Differential Diagnosis List:** Diaphragmatic hernia with organoaxial gastric volvulus and Tension Gastrothorax, Traumatic Diaphragmatic Injury, Bochdalek's or Morgagni Diaphragmatic hernia

**Final Diagnosis:** Diaphragmatic hernia with organoaxial gastric volvulus and Tension Gastrothorax

**References:**


Figure 1

Description: Chest X-Ray PA view shows huge round gas collection in the lower part of right hemithorax. Right diaphragm is not clearly delineated. Large part of right hemithorax are opacified by a combination of pleural effusion, consolidation and atelectasis. Origin: © Indira Ghandi Memorial Hospital (IGMH), 2020
**Description:** Follow up AP radiograph after 1 day showed mild increase in the size of the gas collection. ECG leads and wires seen. **Origin:** © Indira Ghandi Memorial Hospital (IGMH), 2020
Figure 2

Description: Coronal non-contrast CT chest shows air distended stomach (S) within the right hemithorax. Abnormal rotation of the stomach (S) around its axis with greater curvature (GC) superior and lesser curvature (LC) inferior. Pylorus (P) Right pleural effusion (PE). Heart (H) displaced to left.

Origin: © Indira Ghandi Memorial Hospital (IGMH), 2020
**Description:** Coronal non-contrast CT posterior to 2a, shows Gastro-oesophageal junction (black star) is proximally displaced with kinking of fluid filled distended esophagus (E). Borders of stomach marked by open arrows. **Origin:** © Indira Ghandi Memorial Hospital (IGMH), 2020
Figure 3

Description: Axial non-contrast CT shows distended stomach with air fluid level and transverse colon (TC) in right hemithorax causing compression of cardiac chambers (H) and mediastinal shift to the left side. Origin: © Indira Ghandi Memorial Hospital (IGMH), 2020
Description: Sagittal non-contrast CT chest shows distended stomach and transverse colon (TC) in thorax. Collapsed right lung (RL) and pleural effusion (PE) Note the collapsed pylorus (orange star).

Origin: © Indira Ghandi Memorial Hospital (IGMH), 2020