

# A Case of Tension Pyopneumothorax Mimicking as Gastric Herniation

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## Clinical Summary

A 35-year-old non-smoker, labourer, admitted in our hospital with complaints of low-grade, intermittent fever with exertional dyspnoea for the last two months and left-sided pleuritic chest pain for one month. He had taken anti-tuberculous treatment in 2009 for pulmonary tuberculosis under directly observed treatment, short-course (DOTS) for six months and improved clinically. He had suffered a blunt trauma to the chest (right lateral) six months back before admission when a cow struck him with its hooves. On examination, the patient was afebrile with a mediastinal shift to the right. There was tympanic note in the upper part of bilateral hemithorax and stony dull note in the lower part with a horizontal upper border bilaterally with absent breath sound all over the areas.

## Investigations

Chest radiograph showed horizontal air-fluid level going across the mediastinum (Figure 1). Though the radiological picture was atypical, a differential diagnosis of hydropneumothorax and gastric herniation was made. Complete blood count, liver function test, kidney function test, serum electrolytes were within normal limits. Sputum smear for acid-fast bacilli (AFB) was negative. Before final confirmation by computed tomography (CT) of thorax, an intercostal drain was put on the left side due to increasing shortness of breath and approximately 600mL of pus was drained. After intercostal drain, chest radiograph remained almost the same (Figure 2).



Figure 1. Chest radiograph (postero-anterior view) showing horizontal air-fluid level involving both the hemithorax.



Figure 2. Chest radiograph (postero-anterior view) showing air-fluid level persisted even after inter-costal tube insertion.

Pleural pus was found to be negative for AFB staining and later on mycobacteria growth indicator tube (MGIT) culture showed no growth. Pleural pus pyogenic culture was sterile. The horizontal air-fluid level was persisted even after pus drainage. Contrast enhanced computed tomography (CECT) thorax done on the next day showed large hydropneumothorax occupying whole of the left and most of the part of the right hemithorax (Figure 3). Gradually over the next few days mediastinum came to its normal position (Figure 4).



Figure 3. Contrast enhanced computed tomography of thorax showing horizontal air-fluid level involving the entire left hemithorax and most of the right hemithorax.



Figure 4. Chest radiograph (postero-anterior view) done after two weeks showing return of the mediastinum to its normal position.

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**Diagnosis:** *Left-sided pyopneumothorax.*

## Discussion

Tension pneumothorax occurs when air enters the pleural space through a defect in the visceral or parietal pleura with the development of a one-way valve mechanism; intra-pleural pressure then exceeds atmospheric pressure during expiration and often during inspiration. Tension pyopneumothorax occurs when an empyema causes a pneumothorax.<sup>1</sup> Radiologically it presents as horizontal air-fluid level with contralateral mediastinal shift and usually air-fluid level of pyopneumothorax does not cross the mediastinum. Tension pyopneumothorax is an emergency situation because of reduced venous return to the heart with secondary decreased cardiac output and of compression and deviation of the contralateral lung secondary to mediastinal deviation.<sup>2</sup> Tension pyopneumothorax is rare and may occur as a complication of pneumonia<sup>1</sup> or lung abscess eroding into the pleural space.<sup>2</sup> It has also been described as a complication of streptococcus pyogenes pharyngitis<sup>3</sup> and of ruptured oesophagus due to Barrett's oesophagus<sup>4</sup> and to Boerhaave's syndrome in an alcoholic patient with recurrent vomiting.<sup>5</sup>

Gastric herniation or hiatal hernia is defined as proximal displacement of the stomach and the gastro-oesophageal junction into the thoracic cage above the diaphragm.<sup>6</sup> The most common herniated organ is the stomach. On chest radiograph hiatus hernia appears as retro-cardiac mass or retro-cardiac air-fluid level. For this reason we have considered hiatus hernia as a differential diagnosis. Hiatal hernia has been reported in at least 10% of the adult population.<sup>7</sup> Patients may be asymptomatic or present with a spectrum of symptoms. The gold standard modality for the diagnosis of hiatal hernia is contrast study in which the anatomical abnormalities of the gastrointestinal tract are best seen. Barium study increases the sensitivity in the evaluation of this condition.<sup>8,9</sup>

To the best of our knowledge, pyopneumothorax with air-fluid level involving both the hemithorax has not been described earlier. This case is unique in other aspects too as in spite of having tension pyopneumothorax the patient did not have symptoms of tension and history was not acute, rather gradual (2 months). Another feature is that even after intercostal tube insertion, the tension did not get relieved immediately and it took few days for the mediastinum to come to its normal position. The patient did not even have toxic features of pyothorax. To conclude, in patients presenting with x-ray showing air-fluid level across the mediastinum, rare possibility of pyopneumothorax should also be considered.

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