



## Gastropleural Fistula: Two Cases Highlighting Varied Manifestations and Management Strategies

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### KEYWORDS

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### ABSTRACT:

Gastropleural fistula (GPF) is an uncommon medical disorder characterised by an improper connection between the stomach and the pleural cavity, resulting in the presence of hydropneumothorax. The reasons for this condition can be attributed to trauma, cancer, ulcers. The symptoms encompass abdomen and chest pain, enduring discharge, and the presence of food particles in fluids. Radiological examinations facilitate the process of diagnosing medical conditions. This study showcases instances of GPF resulting from trauma and malignancy, intending to emphasise its varied presentations. The cases were examined for their clinical manifestations, radiographic observations, and approaches to treatment. The results exhibited diverse symptoms, accompanied by consistent radiological indications. Timely diagnosis and action resulted in favourable outcomes. Timely identification of GPF is crucial to avoid any consequences. This study highlights the importance of keeping a high level of suspicion for GPF (gastric perforation) in patients who are at risk, to enhance outcomes and decrease the occurrence of complications and death.

### Introduction

Gastropleural fistula (GPF) is an uncommon but medically important disorder marked by an anomalous connection between the stomach and the pleural cavity.<sup>(1)</sup> This connection leads to the formation of hydropneumothorax. The various causes of this condition include operative injuries or trauma, as well as perforations that occur due to underlying cancers, ulcers. The clinical manifestations vary from gut pain and chest discomfort during breathing to continuous drainage after tube thoracostomy, frequently accompanied by food particles in the drained fluids. Radiological examinations, such as imaging techniques that indicate the presence of hydropneumothorax and pneumomediastinum, play a crucial role in the diagnosis. Prompt comprehension and identification of GPF are essential due to its capacity to result in substantial illness and death if not treated.<sup>(1,2)</sup> Therefore, this case series seeks to examine the complexities of GPF, by analysing

cases that arise from traumatic events and malignancies. By clearly explaining the different ways in which GPF might appear, we emphasise the importance of maintaining a strong level of suspicion for GPF in clinical practice.

### Case Report 1:

A 60-year-old gentleman with diabetes, normotensive, and non smoker reported to the Emergency department. He complained of a sudden onset of breathlessness (MMRC grade IV) and orthopnea for one day, as well as left-sided pleuritic chest pain for one day. The vital signs showed a body temperature of 38.5 degrees Celsius, a pulse rate of 112 beats per minute, a blood pressure of 110/70 millimetres of mercury, a respiratory rate of 30 cycles per minute, and an oxygen saturation of 92% at room air. Upon auscultation, there is a noticeable reduction in breath sounds on the left hemithorax. All other general physical examinations were normal.



He experienced a traumatic event 3 months ago and suffered injuries to his left chest, abdomen, and right leg. The patient's right leg was rendered immobile by a local practitioner, resulting in the development of Deep Vein Thrombosis in the right tibial, popliteal, and femoral veins. The patient received treatment with anticoagulant medications.

The chest X-ray revealed a homogenous opacity on the left side. The patient's haematological profile, renal function, and liver function were within normal limits. The electrocardiogram (ECG) shows normal sinus rhythm. The D-dimer level is increased at 2100ng/ml. An ultrasound of the abdomen showed a splenic infarct, although the other underlying organs appeared normal. Repeat Doppler examination of both lower limbs revealed no signs of deep vein thrombosis (DVT). The CTPA indicates a significant left hydropneumothorax without any signs of pulmonary embolism. ICD with a diameter of 28 French was introduced into the left safety triangle, and 1 litre of serosanguinous fluid with no unpleasant odour was drained. The investigation of the pleural fluid showed a lymphocytic exudative pleural effusion with normal glucose levels, low ADA (28 IU/L), low cholesterol (1 mg/dL), and low triglyceride levels (40 mg/dL). The pleural fluid culture yielded no growth. The pleural fluid cytology revealed the presence of inflammatory cells.

On the third day, a malodorous and milky white pleural fluid was extracted along with stomach contents. Due to a persistent drainage of over 2 litres for a duration of more than 5 days, a Contrast CT Abdomen scan was conducted. The scan revealed the presence of a fistulous connection between the fundus of the stomach and the left pleural cavity. A barium swallow test verified the leakage of barium dye through a fistulous junction between the stomach and pleura. The upper gastrointestinal endoscopy also confirmed the same findings. The patient was kept nil per oral and enteral feeding was initiated. The ICD drain saw a gradual decline. The patient underwent a diagnostic laparoscopy and sleeve gastrectomy on the 15th day, and the ICD was removed on the 3rd postoperative day.

## Case report 2:

A 43-year-old male smoker, without any other medical conditions, arrived at the Emergency department with

symptoms including left-sided chest pain, dry cough, upper abdomen pain, breathing difficulty (MMRC III), and a low-grade fever persisting for 3 weeks. He experienced 8kg reduction in weight over the course of one month. On general examination Clubbing was observed. The vitals were within the normal range. On respiratory examination, there were absent breath sounds detected in the left lower interscapular and infra axillary regions. The abdominal examination revealed pain in the left hypochondriac and epigastric regions, without any signs of rigidity. The blood analysis revealed increased total cell count (19,400 cells/mm<sup>3</sup>), decreased haemoglobin levels (8.2 g/dL), and elevated liver enzymes: AST- 167 U/L and ALT-158 U/L. The kidney function tests were within the usual range. An abdominal ultrasound showed a grade 1 fatty liver, with all other underlying organs appearing normal. The patient was initiated on empirical intravenous antibiotics, specifically piperacillin+tazobactam, at a dose of 4.5g every 8 hours. Additionally, various supportive measures were implemented. The HRCT thorax scan showed a moderate hydropneumothorax on the left side. During diagnostic thoracentesis, a sample of fluid was extracted and found to be stained with blood. Analysis of the fluid revealed the presence of a neutrophilic exudate, with low pH (6.12), low glucose levels (30mg/dL), and low ADA levels (20IU/L). E.coli was cultivated in pleural fluid culture, so antibiotics were maintained according to the culture sensitivity data. The cytology report indicated the absence of abnormal cells or granulomas. An ICD tube with a diameter of 24 French was introduced into the left triangle of safety and of 1.2 litres of serosanguinous fluid was drained.

On the fourth day, there was a consistent discharge of almost 1.5 litres per day containing food particles. Therefore, a potential connection between the stomach and pleura was suspected, leading to the performance of a contrast CT Abdomen. The results of the scan indicated a fistulous connection between the left pleural cavity and the fundal region of the stomach, along with the presence of a mass in the fundal area. During the Upper GI Endoscopy procedure, a globular swelling was observed in the fundus of the stomach, along with a fistulous opening. A biopsy was performed, and the results indicated the presence of infiltrating poorly differentiated adenocarcinoma. PET-CT showed mild mural thickening in the fundus of the stomach with increased metabolic



activity. Omental and peritoneal thickening in left hypogastric region with mild patchy metabolic activity. Patient was planned for total gastrectomy with fundal closure. The patient was scheduled to have a total gastrectomy procedure with closure of the fundus. The ICD tube was removed on postoperative day 3. Patient referred to medical oncology centre for palliative chemotherapy and was started on Tab. Capecitabine 500mg three times a day for a week followed by one week of abstinence for 1 month. The patient is now on regular follow-up.

## Discussion:

Gastropleural fistula (GPF) is an uncommon although potentially serious disorder characterised by an anomalous connection between the stomach and the pleural area.<sup>(1)</sup> Although GPF is uncommon, it presents a range of complex clinical symptoms, often resulting in delayed diagnosis and treatment. Common symptoms include breathlessness, pleuritic chest pain, dry cough, and abdominal discomfort.<sup>(1)</sup> In addition, unusual manifestations such as haemoptysis, recurrent pneumonia and shoulder tip pain.<sup>(5)</sup> It is important to mention that GPF can present as hydropneumothorax, which requires careful monitoring for continuous drainage, especially when gastric contents are present.<sup>(1)</sup> Imaging techniques play a crucial role in identifying GPF, with contrast-enhanced CT scans, gastrografin studies, barium swallow tests, and upper GI series serving as helpful diagnostic tools<sup>(3-4)</sup>. In addition, methylene blue swallow tests can verify the diagnosis by detecting the presence of dye in the drainage from the chest tube<sup>(3)</sup>. Nevertheless, in certain instances, invasive techniques such as endoscopy, thoracotomy, or exploratory laparotomy may be required to establish a conclusive diagnosis<sup>(6-8)</sup>.

Typical factors leading to GPF include severe traumas, diaphragmatic hernias, and perforations caused by esophageal hiatal hernias or subphrenic abscess.<sup>(9)</sup> The morbidity and mortality linked to GPF result from the leakage of corrosive gastric contents into the pleural and peritoneal cavities, causing nutritional deficiencies.<sup>(2)</sup> The treatment usually starts with conservative approaches, such as administering antibiotics, providing rest to the gastrointestinal system, and inserting a chest tube<sup>(3)</sup>. Various surgical procedures may be necessary, ranging from thoracotomies to

laparotomies.<sup>(6-8)</sup> Occasionally requires tissue resection in addition to fistula repair.<sup>(8-10)</sup> The cases presented demonstrate the varied clinical circumstances seen in the management of GPF. Case Report 1 highlights the difficulties in diagnosing GPF, which require the utilisation of varied imaging techniques and invasive procedures for confirmation. On the other hand, Case Report 2 focuses on the connection between GPF and underlying malignancies, underscoring the significance of thorough assessment and interdisciplinary treatment.

GPF is an intricate clinical disorder that necessitates immediate diagnosis and treatment. By doing thorough clinical assessments, utilising imaging techniques, and performing necessary surgical procedures, it is possible to get the best results, hence decreasing the rates of associated illness and death. Thorough evaluation and careful monitoring in clinical settings are essential for furthering our comprehension and enhancing treatment approaches for GPF.

## Conclusion:

Diagnosing Gastropleural fistula (GPF) presents a significant difficulty and is frequently prone to delays. Hence, it is crucial to include gastropleural fistula as a potential diagnosis for individuals with relevant risk factors, in addition to more prevalent primary pulmonary and gastrointestinal conditions. By conducting a comprehensive evaluation and promptly implementing appropriate measures, favourable results can be attained. Both instances had significant clinical signs, including continuous drainage of pleural fluid surpassing 1.5 litres per day for consecutive days, along with specific symptoms and patient history, indicating the existence of a fistulous link between the pleura and stomach. Case 1 exhibited an increase in drainage after eating, which was accompanied by a previous incident of blunt abdominal trauma. In Case 2, there was blood-stained fluid mixed with food particles, as well as abdominal pain. While it is uncommon to come across gastropleural fistula, the presence of prolonged effusion should be viewed with suspicion, as it could potentially be an early sign of GPF. Prompt diagnosis is crucial, as delayed identification can result in substantial illness. Hence, it is imperative to uphold a vigilant attitude and swiftly examine instances exhibiting indicative clinical characteristics in order to achieve the best possible patient results.



**Abbreviation:**

GPF-gastropleural fistula.

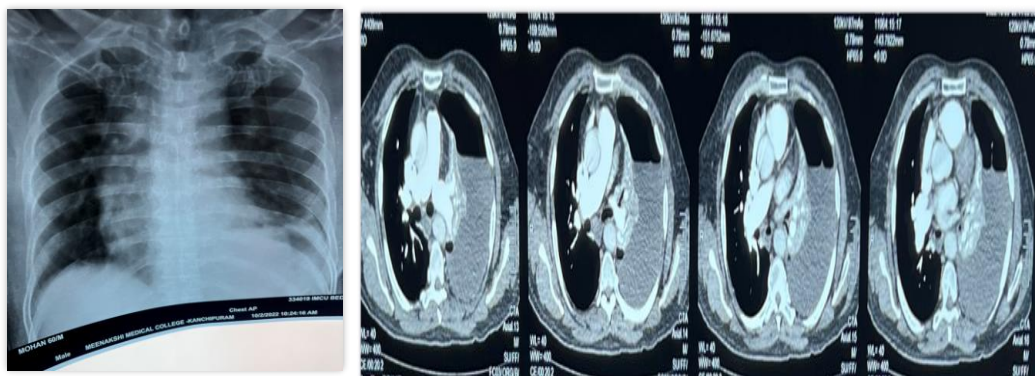
ICD- intercostal drainage

DVT-deep vein thrombosis

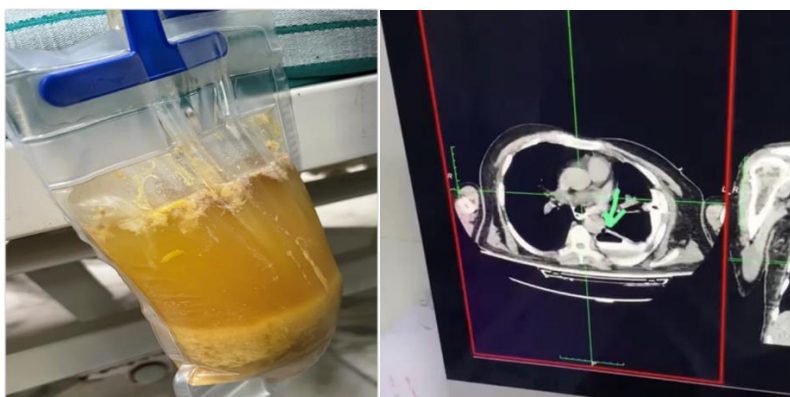
CTPA- CT pulmonary angiogram

CP- costophrenic angle

**IMAGES: Case 1:** Chest Xray AP view(day1): 2/10/2022 f/s/o blunting of costophrenic angle, No mediastinal shift.

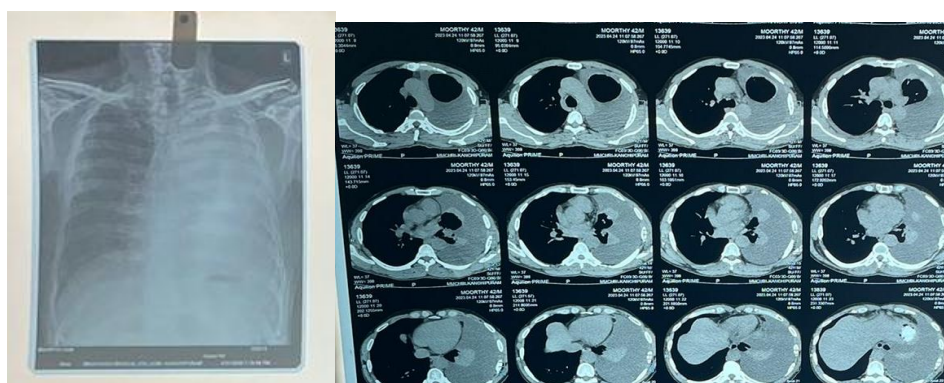


CTPA chest: Moderate left hydropneumothorax with no thrombus or embolus in the pulmonary artery.



**Case 2:** chest xray- left cp angle blunting with left hemithorax homogenous opacity.

HRCT chest- left moderate hydropneumothorax







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