**Scholars Journal of Medical Case Reports**
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

**Radiology**

# Pyelopleural Fistula Revealed by Persistent Pyothorax: A Case Report

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**DOI:** https://doi.org/10.36347/sjmcr.2025.v13i07.041 | **Received:** 13.05.2025 | **Accepted:** 18.07.2025 | **Published:** 21.07.2025

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**Abstract** | **Case Report**

Pyelopleural fistulas are an exceptionally rare clinical entity, characterized by an abnormal communication between the upper urinary tract and the pleural cavity, most often secondary to chronic pyonephrosis. We report the case of a 48-year-old man hospitalized for a persistent left-sided pyothorax that did not resolve despite thoracic drainage performed 12 days earlier. The clinical presentation included severe sepsis, gross pyuria, and acute renal failure. Contrast-enhanced thoraco-abdominopelvic CT imaging revealed a left-sided pyonephrosis with a large staghorn calculus and a perirenal collection extending through the diaphragm into the pleural cavity, consistent with a pyelopleural fistula. Management included targeted antibiotic therapy, continued pleural drainage, and percutaneous nephrostomy. This case highlights the importance of considering a urological etiology in unexplained, persistent pyothorax.

**Keywords:** Pyelopleural fistula, pyonephrosis, empyema, staghorn calculus, contrast-enhanced CT.



## INTRODUCTION

Pyelopleural fistula is a rare complication of chronic urinary tract infections, with fewer than thirty cases reported in the international literature [1]. It results from a pathological retrograde extension of purulent renal contents into the pleural space, often in the setting of neglected pyonephrosis, obstructive urolithiasis, or chronic renal infection [2,3]. Diagnosis is challenging due to a predominance of nonspecific respiratory symptoms. Here, we present an unusual case of pyelopleural fistula diagnosed in the context of persistent pyothorax.

## CASE REPORT

A 48-year-old male with no significant medical history was admitted with a fever of 39.5 °C, chills, productive cough, dyspnea, and left-sided chest pain. Twelve days prior, he underwent pleural drainage for a left pyothorax with no significant clinical improvement.

Upon admission, clinical examination revealed a respiratory rate of 28/min, heart rate of 110 bpm, blood pressure of 120/70 mmHg, oxygen saturation of 94% on supplemental oxygen, and a temperature of 39.5 °C. Laboratory investigations showed leukocytosis (15,000/mm³), elevated CRP (112 mg/L), and serum creatinine of 165 µmol/L (estimated GFR: 42 mL/min/1.73 m²).

**Contrast-enhanced thoraco-abdominopelvic CT revealed:**

- Loculated pleural effusion with air-fluid levels;
- Properly positioned thoracic drain;
- Left-sided pyonephrosis with massive dilatation of the pelvicalyceal system;
- A large staghorn calculus measuring 67 x 42 mm;
- A perirenal collection (70 x 47 x 18 mm) extending through the diaphragm via an 8.5 mm tract, consistent with a pyelopleural fistula.

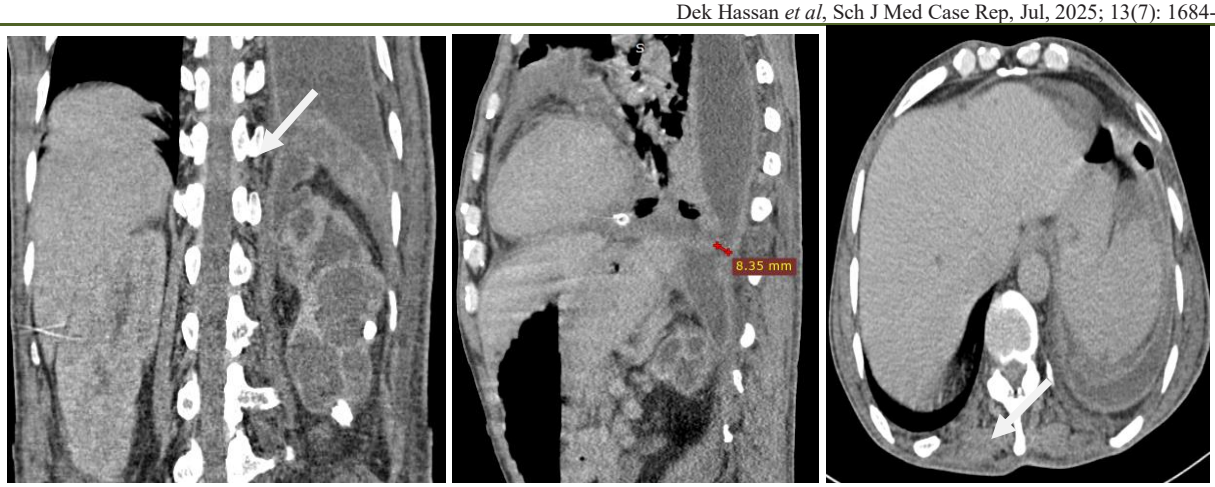


**Figure 1: Post-contrast sagittal, coronal, and axial CT images showing an 8 mm fistulous tract between a left perirenal collection and the pleural cavity**

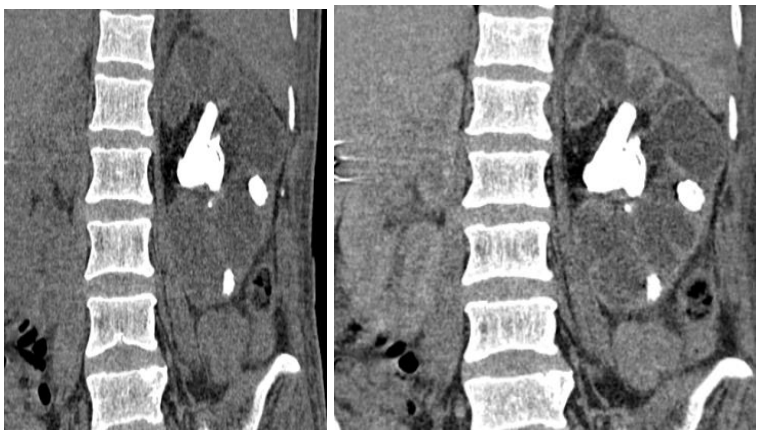

**Figure 2: Coronal pre- and post-contrast CT images showing an enlarged left kidney with pale nephrogram and marked hydronephrosis due to multiple obstructive stones**

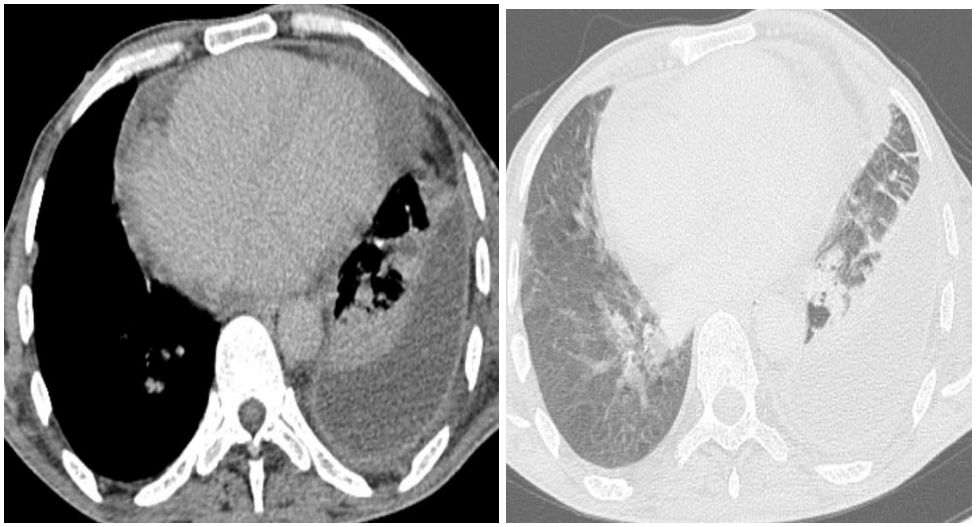

**Figure 3: Axial CT (mediastinal and lung windows) showing moderate pleural and pericardial effusions with enhancing pleural thickening and adjacent atelectasis**

Urine culture grew *Escherichia coli*, sensitive to third-generation cephalosporins. The patient was managed with targeted intravenous antibiotics, maintenance of pleural drainage, and percutaneous nephrostomy.

## DISCUSSION

***Contribution of Cross-sectional Imaging:***

Contrast-enhanced CT scan of the thoraco-abdominal region is essential for the diagnosis of pyelopleural fistula. It allows for precise visualization of the renal parenchyma, collecting system, perirenal

collections, the fistulous tract, and associated pleuropulmonary complications. In our case, CT imaging was instrumental in redirecting the diagnostic orientation toward a urological origin.

CT is the first-line modality due to its superior capacity to delineate the extent of renal and pleural involvement, to detect aerogenic and calcified components, and to guide interventional procedures. While MRI offers better soft tissue contrast and avoids iodinated contrast agents, it is less practical in emergency settings and less effective in identifying gas or calcifications.

Nuclear scintigraphy or retrograde pyelography can offer supplementary diagnostic information, but these modalities are less frequently used in acute infectious scenarios.

***Pathophysiology of the Pyelopleural Fistula:***

Pyelopleural fistula is a rare and serious complication of suppurative renal infections, particularly in cases of obstructive uropathy due to staghorn calculi [1–3]. The pathophysiological mechanism involves the extension of infected fluid through retroperitoneal and diaphragmatic planes into the pleural cavity [4].

***Clinical Presentation and Diagnostic Challenge:***

The clinical presentation is often misleading, dominated by thoracic symptoms such as dyspnea, cough, or chest pain. This can result in delayed recognition of the underlying renal pathology. In our case, the initial suspicion was directed towards a pulmonary infection, until the CT scan revealed the renal origin of the pyothorax.

Despite moderate renal impairment, the diagnostic benefit of contrast-enhanced CT was judged to outweigh the potential risk, with adequate hydration protocols applied.

***Multidisciplinary Management Approach:***

Management of pyelopleural fistula requires a coordinated multidisciplinary strategy. This includes thoracic drainage for empyema, targeted antibiotic therapy based on microbiological findings, and decompression of the urinary tract. Depending on the renal status and the extent of damage, percutaneous nephrostomy or nephrectomy may be indicated [2,5].

## CONCLUSION

Pyelopleural fistula is a rare but life-threatening cause of persistent pyothorax. This case emphasizes the importance of considering a urological origin in patients with unexplained or refractory empyema. Contrast-enhanced cross-sectional imaging is essential for accurate diagnosis and must be promptly performed to enable early identification and guide targeted, life-saving interventions.

**Conflict of Interest:** The authors declare no conflicts of interest.

## REFERENCES

1. Jones GH, Kalaher HR, Misra N, Curtis J, Parker RJ. *Empyema and respiratory failure secondary to nephropleural fistula caused by chronic urinary tract infection: a case report*. Case Rep Pulmonol. 2012;2012:595402. doi:10.1155/2012/595402.
2. Ramesh V, Gopalakrishnan R. *Pyonephrosis with nephropleural fistula and empyema thoracis: a case report*. Urol Ann. 2014;6(1):90–92.
3. Latchana N, et al. *Pyelopleural fistula presenting as empyema: a rare entity*. Chest. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6855852/
4. Thomas AA, Lane BR, Campbell SC. *Nephropleural fistula: a rare complication of xanthogranulomatous pyelonephritis*. Int Braz J Urol. 2006;32(4):433–435.
5. Yadav AK, et al. *Urinothorax and pyelopleural fistula: Unusual cause of pleural effusion*. Lung India. 2015;32(2):174–177.
6. Kolla SB, Kumar S, Kumar V, et al. *Pyelonephritis complicated by nephrobronchial fistula: imaging findings and management.* Indian J Urol. 2013;29(4):337–339. doi:10.4103/0970-1591.120112.
7. Patil PV, Kundargi VS, Patil BS. *Computed tomography in evaluation of spontaneous pyelopleural fistula: a rare entity.* J Clin Diagn Res. 2016;10(2):TD01–TD02. doi:10.7860/JCDR/2016/15891.7192.