




# Bronchoperitoneal Fistula Secondary to Right Lower Lobe Pneumonia

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## Abstract

In this case report, we report a case of bronchoperitoneal fistula secondary to pneumonia in a 25-year-old male patient who presented with pain abdomen and fever with provisional diagnosis of duodenal perforation and air under right diaphragm in chest radiograph. Diagnosis of bronchoperitoneal fistula was made on computed tomographic findings, which showed consolidation and small cavity in the right lower lung lobe communicating with a loculated air pocket in the right subphrenic space through a right hemidiaphragmatic defect. Knowledge of this entity is important as fistula can be overlooked and can lead to mismanagement.

## Keywords

- ▶ bronchoperitoneal fistula
- ▶ pneumoperitoneum
- ▶ *Klebsiella pneumoniae*

## Key Messages

Bronchoperitoneal fistula is rare entity that can be overlooked in imaging and can lead to misinterpretation and mismanagement as hollow viscus perforation.

## Introduction

Bronchoperitoneal fistulae are rare with seven case reports in literature. Most of the cases reported were due to erosion of diaphragm and lung parenchyma by subdiaphragmatic infection. In this case report, we report a case of bronchoperitoneal fistula secondary to right lower lobe *Klebsiella pneumoniae*, managed conservatively by percutaneous drainage (PCD) and antibiotics. The knowledge of this entity is important in diagnosis of fistula as fistulous connection can be overlooked in the imaging and can lead to misdiagnosis of hollow viscus perforation and mismanagement

## Case History

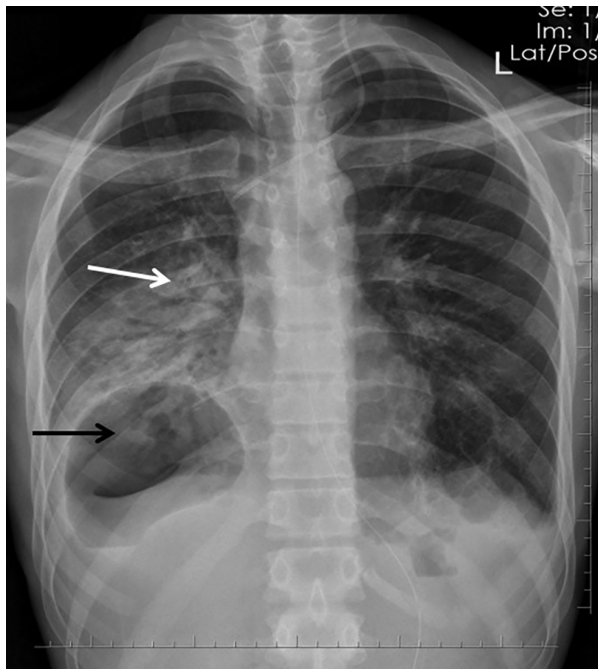
A 25-year-old male patient presented with abdominal pain in the epigastric region, abdominal distention, and fever for the last 1 week. Clinical suspicion of duodenal perforation was raised and radiograph of chest was requested. Initial chest radiograph (▶ Fig. 1) showed consolidation in the right mid and lower lung

zones with air in right subdiaphragmatic region. Patient underwent a contrast-enhanced computed tomography (CECT) of the chest and abdomen for the evaluation of pneumoperitoneum. CECT (▶ Figs. 2 and 3) showed consolidation in the right lower lobe with bulging fissures, centrilobular nodules with tree in bud appearance in right upper, mid, lower lobe and left lower lobe. There was a small thin-walled cavity in the right lower lung lobe communicating with a loculated air pocket in the right subphrenic space extending through a right hemidiaphragmatic defect. There was also a small right pleural effusion. There was no evidence of hollow viscus perforation on CT. The diaphragmatic defect measured 10 mm. A diagnosis of bronchoperitoneal fistula secondary to a cavitating pneumonia was made on radiographic findings and due to the voluminous pneumonia with bulging fissures, a suspicion of *Klebsiella pneumoniae* was entertained. Patient underwent bronchoscopy and bronchoalveolar lavage (BAL). Culture and sensitivity of the BAL fluid showed growth of *Klebsiella* organism. Patient was managed by intravenous antibiotics (Amikacin 500 mg) and by PCD. Percutaneous drainage was done by placing 8 F pigtail catheter under

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**Fig. 1** Posteroanterior view of chest radiograph showing consolidation in right mid and lower lung zone (white arrow) and air under right subdiaphragm (black arrow).

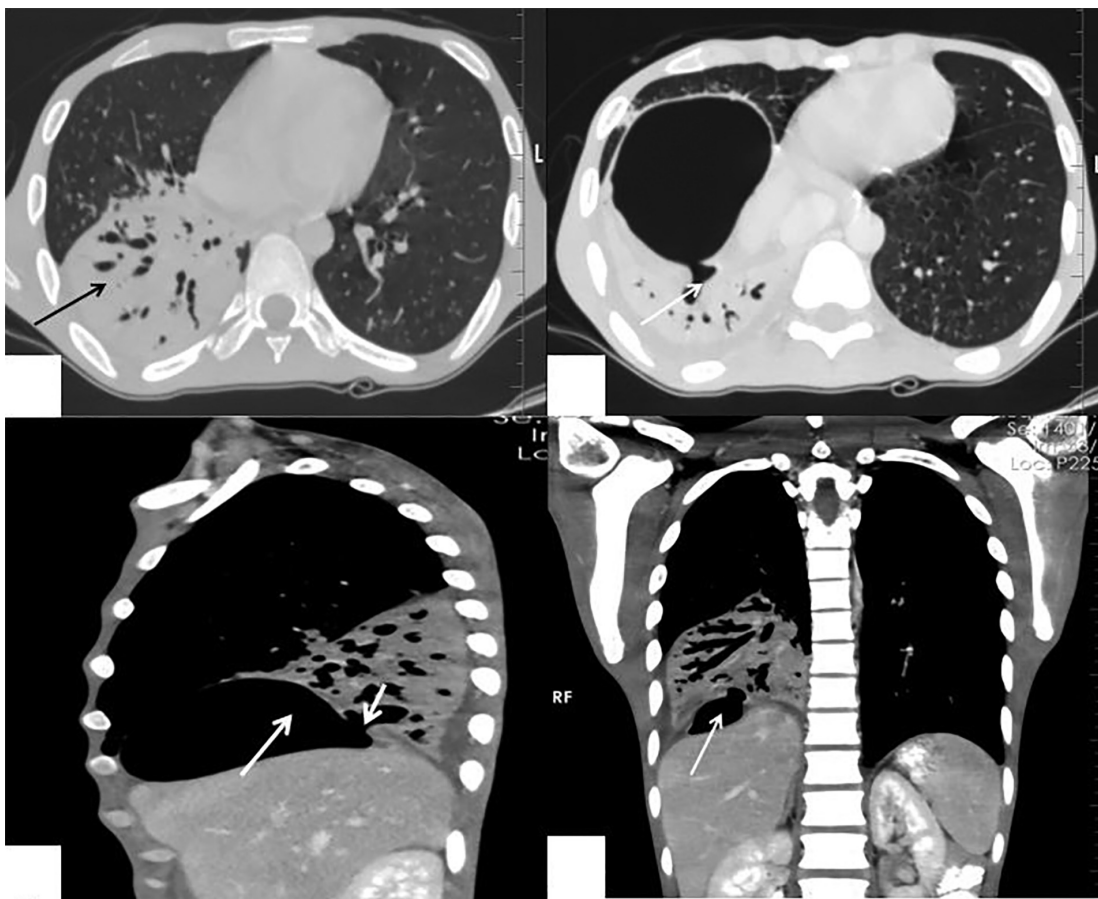
CT guidance. Follow-up radiographs (► **Fig. 4**) showed significant reduction in consolidation and resolution of pneumoperitoneum. Patient was discharged without any complication.

## Discussion

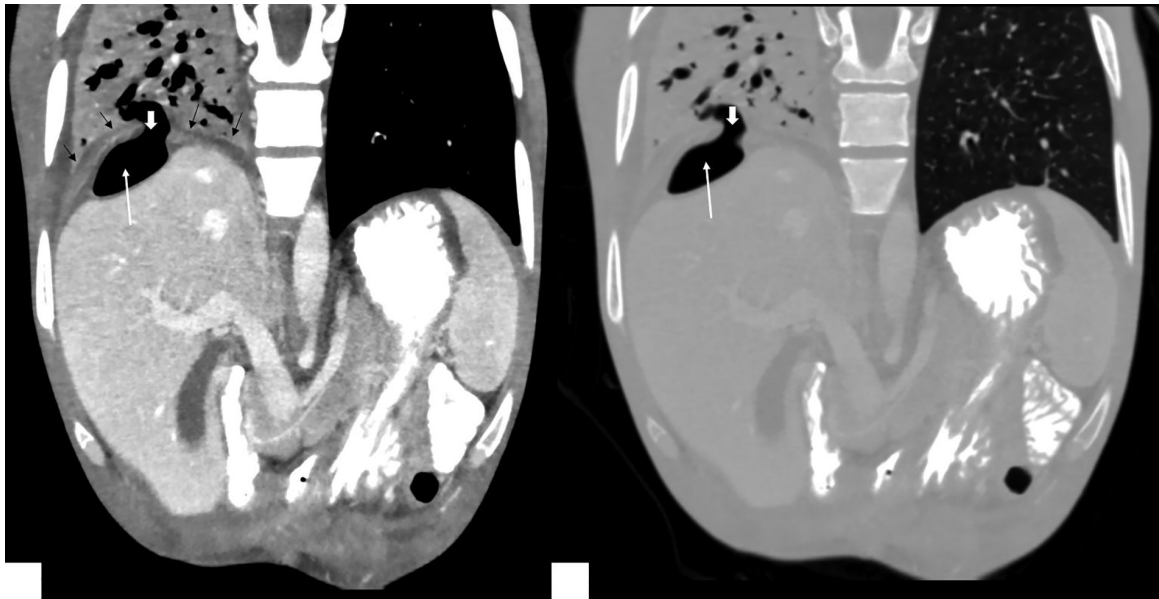
Bronchoperitoneal fistulae are rare. There are very few case reports of bronchoperitoneal fistula in the literature.<sup>1-7</sup> Bronchoperitoneal fistulae occur due to erosion of the diaphragm, pleura and lung parenchyma and are commonly associated with retained drainage tube, lung abscess, acute respiratory distress syndrome, subphrenic collection due to cholecystectomy, duodenal perforation, and synchotomy in patients on ventilation. Most commonly bronchoperitoneal fistulae are seen due to spread of infection from caudal to cranial direction.<sup>1-7</sup> There is only one case report mentioning the bronchoperitoneal fistula due to primary lung abscess.<sup>5</sup>

Management of bronchoperitoneal fistula is not clear. Various management protocols are described that include surgical closure of diaphragmatic defect, high frequency oscillatory ventilation, and conservative management.<sup>1-5</sup>

To our knowledge, this is the first case report of a bronchoperitoneal fistula secondary to cavitating pneumonia, which was managed conservatively with PCD and antibiotics.



**Fig. 2** (A and B) Axial computed tomography of the chest showing consolidation in right lower lobe (black arrow in image A) with small cavity in the basal segment of right lower lobe communicating with the air pocket in right diaphragm through right diaphragmatic defect (white arrow in image B). (C and D) Sagittal and coronal reformatted image in soft tissue window showing loculated air pocket in right diaphragmatic region (long white arrows) communicating with right lower lobe cavity through defect in the right diaphragm (small white arrows).



**Fig. 3** Oblique coronal image in soft tissue (A) and lung window (B) showing air in the right subdiaphragmatic region (long white arrow) communicating with cavity in right lower lobe of lung through defect (short white arrow) in the right diaphragm (black arrow).



**Fig. 4** Follow-up radiograph on post percutaneous drainage day 2 (A) and day 13 (B) showing reduction in the pneumoperitoneum (white arrows) and day 30 (C) showing resolution of the pneumoperitoneum.

The knowledge of this entity is important in diagnosis of fistula as fistulous connection can be overlooked in the imaging and can lead to misdiagnosis of hollow viscus perforation and mismanagement.

#### Conflict of Interest

None declared.

#### Acknowledgment

Nil.

#### References

- 1 Mehta G, Sims C. Spontaneous bronchoperitoneal fistula in the setting of ARDS. *Crit Care Med* 2019;47(01):278
- 2 Caroline C, Weston A, McCallum D. Broncho-abdominal fistula: making the diagnosis and managing the patient. *JICS* 2009;10:220–222
- 3 Stockberger SM Jr, Kesler KA, Broderick LS, Howard TJ. Bronchoperitoneal fistula secondary to chronic Klebsiella pneumoniae subphrenic abscess. *Ann Thorac Surg* 1999;68(03):1058–1059, discussion 1059–1060
- 4 Karanwal D, Holemans JA. Bronchoperitoneal fistula complicating perforated duodenal ulcer. <https://www.eurorad.org/case/2850>. Published on 07.03.2004. Accessed January 28, 2022
- 5 Hsu PS, Lee SC, Tzao C, Chen CJ, Cheng YL. Bronchoperitoneal fistula from a lung abscess. *Respirology* 2008;13(07):1091–1092
- 6 Pesce C, Galvagno SM Jr, Efron DT, Kieninger AA, Stevens K. Retained drains causing a bronchoperitoneal fistula: a case report. *J Med Case Reports* 2011;5:185
- 7 Sagata K, Aibara K, Nandate K, Murakami M, Kamochi M, Shigematsu A. A case of bronchoperitoneal fistula presenting right subphrenic free air under mechanical ventilation. *J Japan Soc Clin Anesth* 2002;22:53–55