

Case Report : Bronchopleural Fistula Dextra with Pyopneumothorax Dextra as Complication of Lung Tuberculosis

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Abstract

Background: Bronchopleural fistula is a rare case that might be caused by trauma, post lung resection surgery, and non traumatic cause such as lung Tuberculosis infection. Bronchopleural fistula is a serious complication of lung TB which almostly related to pleural cavity infection. This fistula condition may be accompanied with empyema that can cause secondary spontaneous pneumothorax. The diagnosis of fistula is established by combination of clinical symptoms regarding lung TB infection, radiology, laboratory, microbiology, dan histopathologi examinations. Management of bronchopleural fistula includes chest tube insertion to treat pyopneumothorax problem, fistula repair surgery, and underlying disease and its comorbid.

Case: We report one case located at RSUD Dr. Saiful Anwar Malang, a 36 year old woman with symptoms of dyspneu and chronic cough with purulent sputum. Based on the clinical data, laboratory results, radiological imaging, sputum examination, and pleural fluid analysis and cytology, diagnosis of bronchopleural fistula together with pyopneumothorax as complication of lung TB was made. Management of this patient comprises of chest tube insertion, fistula repair surgery, antibiotic, and OAT.

Conclusion: Bronchopleural fistula is a rare case found. Proper surgical management and treating underlying disease such as lung TB might improve clinical outcome and reduce mortality rate.

Keywords: Bronchopleural fistula, Pyopneumothorax, Lung TB

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1. Introduction

Bronchopleural fistula is a condition where there is connection between pleural cavity and primary, lobar, or segmental bronchi.^{1,2} This fistula is a serious complication of lung Tuberculosis that is mostly related to pleural cavity infection with incidence rate of 1.3-34.3% and mortality rate of 18-71%.³

The most common etiology of bronchopleural fistula is lung resection (either pneumonectomy or lobectomy).⁴ Next common cause is lung necrosis due to infection, chemotherapy, and radiotherapy. This fistula occurs in 7,8% infection cases and 4% lung cancer cases.⁵

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Pyopneumothorax is accumulation of pus and air within pleural cavity, can be encapsulated or all pleural cavity.^{5,6} Spontaneous pneumothorax develops in 1% of Tuberculosis infection because of pleural necrosis with bronchopleural fistula or cavity rupture into pleural cavity. Pleural effusion might be complication of tuberculosis that can develop into empyema if secondary infection occurs. If the pus penetrate bronchus so the bronchopleural fistula happens.^{6,7}

Computed tomography of thorax can show mediastinal emphysema, parenchymal infiltrates, and enlargement of pleural cavity. The connection between bronchus or lung parenchym and pleural cavity is definitive diagnosis of bronchopleural fistula.^{4,8}

Healing of bronchopleural fistula depends on how fast diagnosis was made, early treatment of tuberculosis, and intercostal

drainage that might help developing lung collapse and minimize the airflow through the fistula into pleural cavity. Surgery management includes thoracotomy and fistula repair.⁹⁻¹¹

2. Case

A 36 year old woman came to hospital with chief complaint of shortness of breath since 3 months ago and got worsen for one last week. The patient complains more dyspnea when she cough. No chest discomfort was reported. She had cough since 3 months ago with whitish sputum and the sputum change into yellowish green in colour for last month. There were no complains of fever, nausea, and vomit. She had history of Diabetes mellitus for 2 years but remains uncontrolled. She previously treated at Lumajang hospital and then was referred to Saiful Anwar hospital for the condition got worse.

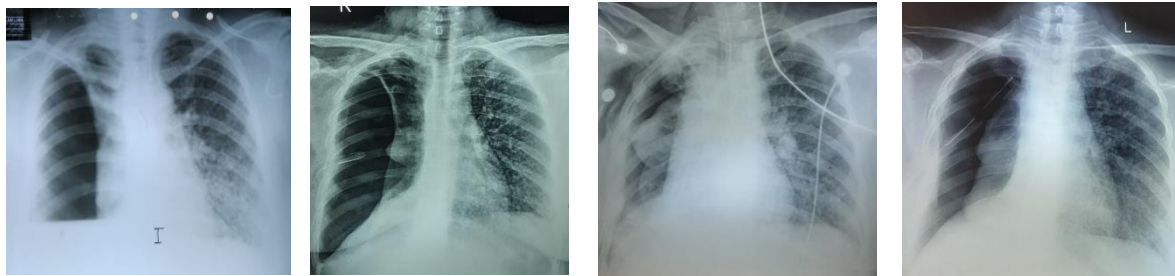


Figure 1. Plain chest radiograph show hydropneumothorax; after chest tube insertion (Fig. 2); after bronchopleural fistula repair (Fig. 3); pneumothorax increase (Fig. 4)

Pleural fluid analysis shows exudative fluid with glucose 2 mg/dL, LDH 13039 IU/L, leucocyte 190.000 /uL, PMN cells 35%, and MN cells 65%. Blood examination shows increase of AST (251 U/L) and ALT (95 U/L) after several days consuming antituberculosis drug. Value of HbA1c was 7.5%. Chest X-Ray was done several times



Figure 5, 6. Chest CT shows Bronchopleural fistula at apical and posterior segmental bronchus of right superior lobe, right fluidopneumothorax, and multiple cavities and fibrosis showing lung TB lesion

The result of sputum TCM Gene-Xpert at October 5th 2020 was MTB detected, rifampicin sensitive. While *Acinetobacter baumannii* was detected on sputum and pleural fluid with amikacin as sensitive drug. Cytology of pleural fluid and lung tissue showed inflammation process.

Management of this patient includes antibiotics, antituberculosis drug with liver modification due to drug induced liver injury, intercostal drainage using chest tube, bronchopleural fistula repair, and superior apex lobectomy of right lung.

(Figure 1-4) since the patient was admitted at Lumajang hospital. Latest X-Ray shows increasing of lung collapse after fistula repair. The patient was planned to undergo repair again but unfortunately she refused the surgery. Chest CT (Figure 5&6) showed bronchopleural fistula at right superior lobe, fluidopneumothorax, and TB lesion.

3. Discussion

We report a 36 year old woman with chief complain of shortness of breath since 3 months ago and got worsen when she cough. She complains coughing for 3 months with production of whitish sputum which turn later into yellowish green for last month. There is no symptoms of dyspnea and cough before. She has history of Diabetes mellitus since 2 years ago but left uncontrolled. Bronchopleural fistula can be caused by several conditions such as lung surgery (pneumonectomy, lobectomy), infection (lung tuberculosis, pneu-

monia).⁴ Acute manifestation of bronchopleural fistula like tension pneumothorax, hypotension, and subcutaneous emphysema can be life threatening. The subacute and chronic form are related to infection, empyema, and immunocompromise state of patient. Similarity of pleural fluid and sputum can be suspicious of developing bronchopleural fistula. Other signs include fever, productive cough, and air fluid level increase in pleural cavity.^{1,2} Chest X-Ray of patient shows hydropneumothorax and tuberculosis infection. In case of bronchopleural fistula, CXR can show enlargement of pleural cavity, new or increasing air fluid level sign, pneumothorax, and parenchymal infiltrates that indicate infection. Thoracic CT might show mediastinal emphysema, parenchymal infiltrates, and most importantly the connection between bronchus or lung parenchyma and pleural cavity as sign of the fistula.⁴

Pleural fluid analysis demonstrates exudative fluid and *Acinetobacter baumannii* microbe was found in pleural fluid culture. Sputum TCM Gene X-pert examination shows result of MTB detected medium, rifampicin sensitive. Result of pleural fluid cytology is only inflammatory cells and fibrosis.

Management of bronchopleural fistula covers intercostal drainage, surgery

(thoracotomy, decortication, necrotic area resection, and fistula closure). Besides, underlying disease treatment is also crucial like lung tuberculosis, pneumonia, and immunocompromise condition.³ The patient got treatment such as fistula repair, right lung apex lobectomy. Results of surgery were empyema with 200cc pus volume, and 2 cm of bronchopleural fistula at right superior lobe at October 6th 2020. Chest X-Ray of October 8th 2020 shows decreasing of lung collapse, nevertheless late CT shows existence of bronchopleural fistula. The patient was planned to undergo repair again but unfortunately she refused the surgery.

Antibiotics given as empiric treatment of this patient were levofloxacin and gentamycin. Later amikacin was given as the pleural fluid and sputum culture results were out. Antibiotic covering anaerobic microbe can be given if empyema occurs.^{12,13} We use antituberculosis drug with liver modification because of increasing transaminase serum level after using fixed drug combination of drug. Rifampicin-Isoniazid-Ethambutol regimen were given to patient for 9 months treatment. In case of drug induced liver injury like this case, if the value of bilirubin >2 mg/dL and or ALT, AST >5x upper normal value, hence the antituberculosis drug given is liver

modification regimen.¹⁴⁻¹⁶ Along the treatment at hospital, the patient had less complain of dyspnea and cough. The general condition of the patient is also got better.

4. Conclusion

Bronchopleural fistula is a serious complication of lung tuberculosis with mortality rate of 18-71%. Management of the fistula includes treatment of underlying disease such as infection, intercostal drainage, dan surgery. Antibiotics are important for pneumonia therapy and antituberculosis drug were given for tuberculosis diagnosis. Insulin was used for Diabetes mellitus treatment since the patient had tuberculosis.

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