Management of Recurrent Pneumothorax and Broncho-Pleural Fistula by Closure of Infected Bullae via Flexible Bronchoscopy Guided Instillation of Silver Nitrate

Sameer Singhal[1], Anand S[2], Alok Ranjan Singh[2], Abinav Dagar[2], Ankit Sharma[2]

ABSTRACT

Introduction: A pneumothorax is defined as the accumulation of air in the pleural space with secondary collapse of the surrounding lung. Pneumothoraces can be divided into spontaneous pneumothorax and traumatic pneumothorax. Spontaneous pneumothorax is subclassified as either primary spontaneous pneumothorax or secondary spontaneous pneumothorax. They are sometimes complicated by a persistent air leak or bronchopleural fistula requiring prolonged chest tube drainage. Non-surgical treatment of persistent broncho-pleural fistula is often performed in patients who are poor surgical candidates, but the ideal method of closure is surgery.

Case Report: The current article is regarding a 55 yr old male patient who presented to the department with left sided pneumothorax and ICD in situ.He had a history of recurrent pneumothorax and a Broncho Pleural Fistula which was closed non surgically using silver nitrate.

Conclusion: Pneumothorax is a very common condition and very frequently it is complicated by the presence of broncho-pleural fistula which in turn leads to persistence of ICD tube for a long time there by affecting the quality of life of the patients and additional chance of secondary infection, since a long time surgery is considered as the only option but in patients who are not fit for surgery, Silver nitrate aided Broncho Pleural Fistula closure is an option and is cheaper and less invasive.

Keywords: Pneumothorax, ICD tube, Bronchopleural Fistula, Surgery, Silver Nitrate

INTRODUCTION

A Secondary Spontaneous Pneumothorax (SSP) is defined as a pneumothorax that occurs in the presence of a pre-existing lung disease.[1] Most commonly associated conditions are Chronic Obstructive Pulmonary Disease, Cystic fibrosis, Carcinomas and Infectious diseases (eg, bacterial or fungal pneumonia, Pneumocystis jirovecii pneumonia, and chronic tuberculosis).[2,3]

Pneumothoraces are sometimes complicated by a persistent air leak or bronchopleural fistula requiring prolonged chest tube drainage. Non-surgical treatment of persistent broncho-pleural fistula is often performed in patients who are poor surgical candidates, but the ideal method of closure is surgery.

CASE REPORT

A 55 yr old male patient presented to the department with left sided pneumothorax and ICD in situ. Patient had shortness of breath and chest pain since two months, he was immediately admitted in a peripheral hospital where ICD (Intercostal drainage tube) was inserted and further chest X-rays showed complete resolution. ICD tube was removed after 3 days and patient was discharged. Three days later patient developed acute shortness of breath, chest X-ray showed hydro-pneumothorax and an ICD was re-inserted. When the chest X-ray showed complete lung expansion, Betadine pleurodesis was performed and subsequently ICD tube was removed. He is a chronic smoker with a Smoking Index (SI)>500 and had Pulmonary Tuberculosis 8 years back for which he had taken complete treatment. After 1 week post ICD removal he again developed shortness of breath and chest x ray (Fig-1) showed Pneumothorax and ICD no. 24 was inserted which relieved him of his breathing difficulties. Patient was discharged with ICD in situ with persistent continuous air leak and referred to our department

Initially on arrival ICD tube was removed and an ICD of increased diameter 32No. (Fig-2) was inserted but it did not help much in improving the patient condition

Further a contrast enhanced CT scan of thorax was performed which suggested the presence of multiple infected bullae and the rupture of an infected bullae communicating with the pleural cavity behind the etiology of recurrent pneumothorax and persistant bronchopleural fistula. He was having history of chronic low grade fever with night sweats but was sputum negative and empirical category 2 anti tuberculous treatment was started, following one week of ATT intake and in view of persisting continuous air leak, patient was posted for flexible bronchoscope guided closure of bullae and bronchopleural fistula with 0.3 % silver nitrate. Procedure was uneventful and immediately post procedure there was drastic improvement and gradually over the following days there was complete absence of air leak suggesting closure of broncho- pleural fistula and ICD tube was removed as chest X-ray shows complete resolution and complete lung expansion (Fig-3).

[1]Professor and Head, [2]Resident, Department of Respiratory Medicine, MMIMSR, Ambala, Haryana, India

Corresponding author: Dr Abinav Dagar, #412, Hostel-9, MMIMSR, Mullana, Ambala-133203, Haryana, India

How to cite this article: Sameer Singhal, Anand S, Alok Ranjan Singh, Abinav Dagar, Ankit Sharma. Management of recurrent pneumothorax and broncho-pleural fistula by closure of infected bullae via flexible bronchoscopy guided instillation of silver nitrate. International Journal of Contemporary Medical Research 2016;3(2):521-522.

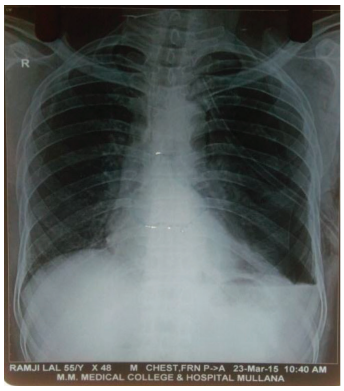


Figure-1: Provide legend; **Figure-2:** Provide legend


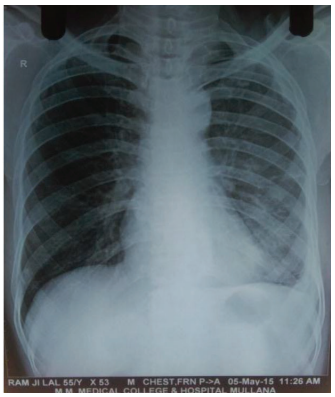

Figure-3: Provide legend; **Figure-4:** Provide legend

Patient was discharged on Category 2 ATT and further follow up Chest X rays showed marked resolution of parenchymal infiltrates (Fig-4).

DISCUSSION

A pneumothorax is air in the pleural space, that is, air between the lung and the chest wall. Pneumothoraces can be divided into spontaneous Pneumothoraces, which occur without antecedent trauma or other obvious cause, and traumatic Pneumothoraces, which occur from direct or indirect trauma to the chest.

Most secondary spontaneous Pneumothoraces are due to COPD (Chronic Obstructive Pulmonary Disease), although almost every lung disease has been reported to be associated with secondary spontaneous pneumothorax.[4] Tuberculosis was the second leading cause of secondary spontaneous pneumothorax after COPD in endemic areas.[5]

COPD patients are sometimes complicated by the presence of emphysematous bullae. A bulla is an air-containing space within the lung parenchyma that arises from destruction, dilatation, and confluence of airspaces distal to terminal bronchioles and is larger than 1 cm in diameter.[6,7]

A superinfection within a bulla can occur with clinical manifestations including fever, cough, purulent sputum production, dyspnea, and pleuritic chest pain.[8,9] Spontaneous pneumothorax may be a complication of bullous disease, particularly in patients who continue to smoke. The typical presentation is a sudden onset or worsening of dyspnea with or without pleuritic chest pain. Ultrastructural assessments suggest the possibility of air leaking through the wall of the bullae with sloughing of mesothelial cells.[10] Patients with pneumothorax secondary to tuberculosis should have surgery if the airleak persists more than a few days or if they have a relapse.[4]

Here in this case patient is been treated with .3% silver nitrate after localization of bronchopulmonary segment with the aid of bronchoscope and methylene blue and the results were highly satisfactory and empirical ATT was started which showed significant clinical and radiological improvement.

CONCLUSION

Pneumothorax is a very common condition and very frequently it is complicated by the presence of broncho-pleural fistula which in turn leads to persistence of ICD tube for a long time there by affecting the quality of life of the patients and additional chance of secondary infection, since a long time surgery is considered as the only option but in patients who are not fit for surgery, Silver nitrate aided Broncho Pleural Fistula closure is an option and is cheaper and less invasive.

REFERENCES

1. Sahn SA, Heffner JE. Spontaneous pneumothorax. N Engl J Med. 2000;342:868.
2. Noppen M, De Keukeleire T. Pneumothorax. Respiration. 2008;76:121.
3. Chen CH, Liao WC, Liu YH, et al. Secondary spontaneous pneumothorax: which associated conditions benefit from pigtail catheter treatment? Am J Emerg Med. 2012;30:45.
4. Weissberg D, Refaely Y. Pneumothorax. Chest. 2000; 117:1279-1285.
5. Blanco-Perez, Bordon J, Pineiro-Amigo L, et al. Pneumothorax in active pulmonary tuberculosis: resurgence of an old complication? Respir Med. 1998;92:1269-1273.
6. Laurenzi GA, Turino GM, Fishman AP. Bullous disease of the lung. Am J Med. 1962;32:361–378.
7. Gaensler E, Jederlinic P, FitzGerald M. Patient work-up for bullectomy. J Thorac Imaging. 1986;1:75–93.
8. Chandra D, Rose SR, Carter RB, Musher DM, Hamill RJ. Fluid-containing emphysematous bullae: a spectrum of illness. Eur Respir J. 2008;32:303–306.
9. Martinez F. Evaluation and medical management of giant bullae in COPD. In: Rose B, ed. UpToDate. Waltham, MA: UpToDate; 2013.
10. Ohata M, Suzuki H. Pathogenesis of spontaneous pneumothorax. With special reference to the ultrastructure of emphysematous bullae. Chest. 1980;77:771–776.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 01-01-2016; **Published online**: 22-01-2016