CASE REPORT

LARGE EMPHYSEMATOUS BULLAE MIMICKING AS A PNEUMOTHORAX LEADING TO UNNECESSARY CHEST TUBE INSERTION AND IATROGENIC PNEUMOTHORAX

Qalb Khan[1], Anisa Batool[2], Muhammad Adnan Haider[3], Muhammad Hanif[4], Mukarram Jamat Ali[5], Saud Bin Abdul Sattar[6], Sheraz Jamal Khan[7]

[1]Well GoodSam Hospital-USA

[2]Jinnah Hospital Lahore, [3]Allama Iqbal Medical College Lahore, [4]Khyber Medical College, Hayatabad Medical Complex Peshawar, [5]King Edward Medical University Lahore-Pakistan

[6]Staten Island University Hospital New York-USA, [7]Hayatabad Medical Complex Peshawar-Pakistan

Pneumothorax (Pnx) is the presence of air or gas in the pleural space which hinders the lungs to function appropriately. Pneumothorax that presents in the absence of any underlying aetiology is called primary spontaneous pneumothorax (PSP) and on the other hand, it may present as a complication of underlying lung disease which is known as secondary spontaneous pneumothorax (SSP). Iatrogenic Pneumothorax (IP) is a type of SSP and is caused by medical interventional procedures which include transthoracic needle biopsy (24%), sub clavicular catheterization (22%), thoracocentesis (20%), transbronchial biopsy (10%), pleural biopsy (8%) and positive pressure ventilation (7%). We had a 51-year-old patient with a history of COPD/emphysema who presented with respiratory distress. Large bullae were mistaken as pneumothorax, unnecessary Chest Tube Insertion (thoracostomy) was performed resulting in IP. An extensive review of the literature shows there are only a few reported cases of unnecessary thoracotomy and IP in settings of giant bulla mimicking pneumothorax. Iatrogenic Pneumothorax resulting from giant bullae mimicking pneumothorax leading to unnecessary chest tube insertion. Physicians should be aware of such aetiology of pneumothorax as it has been rarely reported in the literature.

Keywords: Pneumothorax; Bullae; Emphysematous COPD; Thoracostomy

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INTRODUCTION

Pneumothorax is the presence of air or gas in the pleural space which hinders the lungs to function appropriately. Pneumothorax that presents in the absence of any underlying aetiology is called primary spontaneous pneumothorax (PSP) and on the other hand, it may present as a complication of underlying lung disease which is known as secondary spontaneous pneumothorax (SSP).[1] The most common underlying causes of SSP are COPD (emphysema) followed by cystic fibrosis, status asthmaticus, Pneumocystis carinii pneumonia, necrotizing pneumonia, Sarcoidosis, Idiopathic pulmonary fibrosis, and Marfan syndrome, etc.[2] Iatrogenic Pneumothorax (IP) is a type of SSP and is caused by medical interventional procedures which include transthoracic needle biopsy (24%), sub clavicular catheterization (22%), thoracocentesis (20%), transbronchial biopsy (10%), pleural biopsy (8%) and positive pressure ventilation (7%).[3] People with COPD are also at high risk for iatrogenic SSP usually from complications of mechanical ventilation. According to a study the cases of IP ranges from 0.11% with mechanical ventilation to 2.68% with thoracocentesis and the number of cases of IP are increasing day by day in hospital settings.[4] Another pitiful reason for IP is giant bulla (defined as >2 cm in diameter) which may mimic pneumothorax, leading to unnecessary thoracotomy and IP. Data regarding the incidence of IP lacking, but it varies with underlying lung disease, type of procedures involved, operator skills, etc., and the higher incidence rate is noted in emergency procedures and teaching settings in comparison to non-emergency procedures and non-teaching settings.[5,6]

CASE PRESENTATION

A 51-years-male with a history of emphysematous COPD on 4 Litre of oxygen at baseline presented to the ED via EMS for worsening shortness of breath going for the past few hours. On examination, he was tachycardic, tachypnoeic, and had no breath sounds on his left upper chest. After a few minutes, he became pulseless and spontaneous circulation was maintained after a brief cardiopulmonary resuscitation and he was intubated. A stat bedside CXR was interpreted by an ER physician as pneumothorax and a chest tube was inserted immediately for suspected pneumothorax (based on hypoxemia and CXR findings) (Figure-1). Later on, the radiologist interpreted the initial CXR (done before chest tube insertion) as "appropriately

positioned endotracheal tube, severe bullous emphysema without pneumothorax". Post chest tube insertion, CXR was done and it showed a large left pneumothorax with a chest tube along the left chest wall subcutaneous emphysema. (Figure-2)

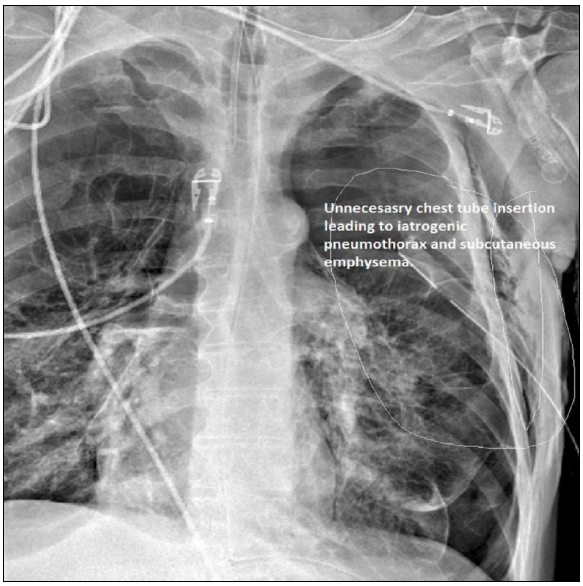

Figure-1: Large bullae which were mistaken as Pnx and chest tube were inserted. Pt had no Pnx in this Xray.

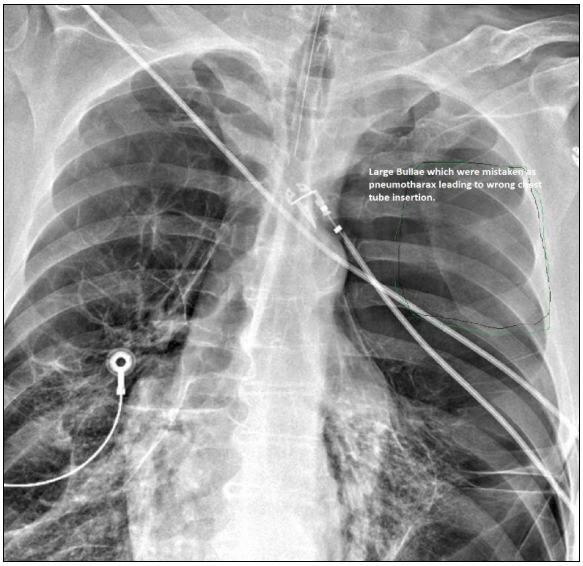

Figure-2: S/P insertion of chest tube and Iatrogenic Pnx.

DISCUSSION

Pneumothorax can be asymptomatic or there can be life-threatening symptoms depending on the size, rate of development, and the health of the underlying lung. Dyspnea is the most prominent clinical feature along with chest pain, cyanosis, hypoxemia. Though diagnosis is usually confirmed with an ultrasound of the chest, posterior-anterior chest radiographs with ultrasound have higher sensitivity depending upon the USG operator's skills.[7] Bullous emphysema can mimic the diagnosis of pneumothorax, thus necessitating CT of the chest for confirmation.[8, 9]

Management/treatment options for PSP range from conservative (observation, oxygen treatment, simple manual aspiration, small catheter drainage) to more invasive treatments including chest tube drainage, video-assisted thoracoscopic surgery (VATS) with bleb- or bullectomy, etc. depending upon the severity of the condition and recurrence.[10]

SSP management usually requires immediate air evacuation, admission, and measures to prevent recurrence before discharge.[10] Most of the time chest tubes, small-bore chest tubes, and even pigtail catheters are usually sufficient but large-bore chest tubes are recommended when large air leaks are suspected or when mechanical positive pressure ventilation is required.[11–13]

Similarly, IP can also be diagnosed with CXR or CT chest if the patient has underlying emphysema/severe bullous disease.[9] If IP is small and without underlying lung disease, treatment can be conservative, however, in the setting of severe underlying emphysematous lung disease, IP should be managed by keeping the chest tube, which was inserted owing to the wrong diagnosis and should only be removed once patient clinical conditions allow.

CONCLUSION

This case illustrates that large emphysematous bulla can mimic the diagnosis of spontaneous pneumothorax (clinically as there are no breath sounds in the large bulla and radiologically as they appear as avascular radiolucent areas with thin curvilinear walls like pneumothorax). Although not as common as other causes of iatrogenic SSP, misdiagnosed large bullae and pneumothorax leading to the placement of the chest tube resulting in pneumothorax should also be kept in mind. Although a relatively very uncommon cause of iatrogenic pneumothorax, still this cause of iatrogenic pneumothorax should be included in reading materials and literature because misdiagnosis, as in our patient, could result in unnecessary chest tube insertion and iatrogenic pneumothorax. Thus, if a patient has suspected SSP and has a history of COPD/emphysema, whenever time permits Chest CT should be done before going for thoracostomy.

Conflict of Interest:
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Address for Correspondence:

Muhammad Hanif, Khyber Medical College, Hayatabad Medical Complex Peshawar, Pakistan
Cell: +92 334 520 2725
Email: hanifafridi273@gmail.com