

Case Report: Pyothorax

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ABSTRACT: Pyothorax is a rare bacterial infection, caused by Streptococcus pneumonia and Staphylococcus aureus, leading to presence of pus and air in the pleural cavity, usually transmitted by medical instruments by surgery on chest. Clinical manifestations range from shortness of breath to chest pain. Here presented is a case of a 60-year old male patient with chest pain (right side), giddiness, sputum expectoration and palpitation.

Keywords: Pyothorax, Streptococcus pneumonia, Staphylococcus aureus.

I. INTRODUCTION

Pyothorax, the presence of pus in the pleural cavity, between the membrane lining the thoracic cage and the membrane covering the lung. It is also called as empyema or purulent pleuritis.^[1] There are different types of bacteria which cause pneumonia. The two most common bacteria are Streptococcus pneumoniae and Staphylococcus aureus.^[2] Pleural space naturally have some fluids. Occasionally, empyema may happen after the surgery on chest. Medical instruments can transfer bacteria into your pleural cavity, which result in the spread of infection from the lung to the bordering pleural membrane. The infected fluid gets thicken. It causes the lining of lungs and chest cavity to stick together and form pockets. After pneumonia, some of the conditions that can increase the chances of empyema are bronchiectasis, chronic obstructive pulmonary disease (COPD), alcoholism, diabetes, a weakened immune system, surgery or recent trauma, lung abscess. Symptoms can be simple and complex empyema. The simple empyema develops at the early stage of the illness and symptoms include shortness of breath, dry cough, fever, sweating, chest pain. The complex empyema develops at the later stage of the illness and symptoms include difficulty in breathing, decreased breath sounds, weight loss and chest pain.^[3] To evaluate the presence of any pleural effusion, there

are some certain procedures to confirm the diagnosis Chest X-rays and CT scans, an ultrasound of the chest, blood tests includes white blood cell count and C-reactive protein, thoracentesis is done to take a sample of fluid to analyse the bacteria, protein and other cells. To treat the underlying infection antibiotics are used and there are some methods used to drain the pus that depends on the stage of the empyema.

1. Thoracostomy: In this procedure, between two ribs plastic tube is inserted into the chest. Then connect the tube to a suction device and remove the fluid, also inject medication to help drain the fluid.
2. Video-assisted thoracic surgery: Removing the affected tissue around the lung and then insert a drainage tube or use medication to remove the fluid. For this process a three small incisions are created and used a tiny camera called a thoracoscope.
3. Open decortication: In this surgery, removing the layer restrictive layer of fibrous tissue overlying the lung.^[3]

II. CASE REPORT

A 60-year-old male patient with a history of Type II Diabetes Mellitus on regular treatment with Nebivolol 2.5mg OD admitted to the hospital on 18.11.2020 due to the complaints of pain in right side of Implantable Cardioverter Defibrillator (ICD), palpitation, giddiness, pedal oedema and C/O sputum expectoration. He had no any significant social history and family history. On general examination the patient was conscious and cooperative. On physical examination his BP: 140/80 mmHg, Pulse Rate: 98bts/min were slightly elevated from the normal and other parameters remains normal. At the time of admission is pain score was noted as 4 in Visual Analogue Scale (VAS). Biochemistry report shows decreased calcium (7.8mg/dL) and sodium level (110mg/dL)

with increased FBS- 115mg/dL and PPBS- 233mg/dL. CT-Chest X-ray reveals Pleural effusion on right side of lungs with right moderate hydropneumothorax with ICD in situ. He was undergone a culture test and organism that was isolated from the pus Gram negative bacilli (fig.1).

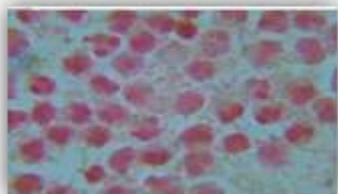


Fig.1 Gram –ve Organism

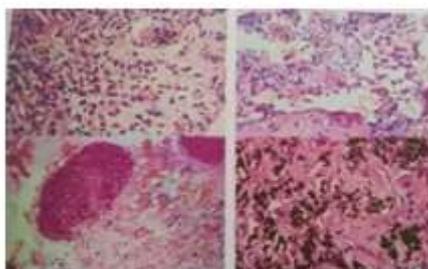


Fig.2. Histopathology of Pleural Specimen

He was finally diagnosed with **Right Side fibrothorax with empyema** and was treated with various intravenous antibiotics; Inj. Ceftriaxone 1gm IV twice daily, Inj. Metronidazole 400mg IV thrice daily on first two days of admission and changed to Tab. Metronidazole 400mg PO thrice daily, Tab. Deriphylline 150mg PO twice daily, Tab. Nebivolol 2.5mg once daily, and Tab. Levocetirizine (5mg) + Montelukast (10mg), Magnesium supplement 400mg once daily, Syp. KCL 100ml once daily, Tab. Paracetamol 650 mg and NaCl 0.9% intravenous infusion was given as whenever necessary and planned for decortication procedure to reduce the pleural effusion. Due to hyponatremia and decreased protein status, patient was asked to review after 3 days with improved protein and sodium level for Decortication procedure – surgical removal of the surface layer, membrane or fibrous cover over an organ thus to help the lung re-expand. He was discharged on 23.11.2020 with Tab. Cefixime, Tab. Metronidazole 400mg 1-1-1, Tab. Deriphylline 150mg 1-0-1, and Tab. Metformin (500mg) + Glimepiride (0.5mg) 0-0-1 to treat his diabetic condition. And on

17.12.2020 he was admitted for the purpose of Right side Decortication procedure and further treatment. Patient was evaluated and posted for surgery on 20.12.2020. As shown in fig.2 during surgery, thickened right side parietal and visceral pleura and lung adhesions were released all around. Histopathology was done for pleural specimen from microbiology and pathological study which showed no specific growth and Right pleural ICD was placed. The patient was discharged with medications such as,

T. Doxolin 400mg ½-0-1/2 (A/F)
 T.Livogen Z 750mg 1-0-1 (A/F)
 T.Paracetamol 500 mg 1-1-1(A/F)
 T.ArkaMin 0.1 mg 1-1-1 (A/F)
 Inj.Lupinsulin 30/70 6U-0-4U (B/F)
 T.Ciprofloxacin 500mg 1-0-1 (A/F)
 T.Rantac 150mg 1-0-1 (B/F)
 Cap.Cephalixin 250 mg 1-0-1 (A/F)

Diet: High fiber, low cholesterol, fruits, vegetables and no sugar.

Exercise: Walking for 30minutes daily, avoid if chest pain.

Targets *LDL<70mg/dL *BP- 120/80 mm Hg
 *Sugar fasting- 100mg/Dl, post breakfast- 150mg/Dl *BMI <25kg/m².

If chest pain persists, T.Sorbitrate 5mg keep under tongue.

III. DISCUSSION

Prabhat B. Nichkaode et al., says that Earlier, pleural empyema is commonly treated to prevent complications, intensive surgeries, and a long stay in the hospital. There are some patients for whom initial treatment is not possible and in whom chronic empyema develops, mainly due to delayed diagnosis or late referral. At this stage, standard treatment is open thoracotomy and decortication. Open window thoracotomy, rib resection, thoracoplasty, Claggett's technique, and percutaneous drainage guided by ultrasound or CT have all been used in the past.^[4]

Video thoracoscopy has been proposed for the treatment of chronic empyema, as minimally invasive surgery becomes more common. According to some studies, open procedures result in a higher rate of morbidity and mortality. The treatment of chronic empyema in the fibrothorax stage has traditionally been open thoracotomy and decortication with or without pleurectomy.

Jung Ar Shin et al., study says that advanced empyema was successfully treated with surgical decortication. In addition, as opposed to

tube drainage, decortication has a tendency to shorten the time from treatment to discharge. Surgical decortication entails removing all fibrous tissue from the pleura and clearing the pleural space of all pus and debris. Decortication is a major thoracic surgery that requires a large incision and is often difficult to perform in patients who are severely disabled. In this case, patient had hypoproteinemia so the surgery was postponed.^[5]

Peilin Cong et al., demonstrates that hypoalbuminemia is a condition that occurs frequently in critically ill patients and is defined as a serum albumin concentration of less than 30 g/l. Albumin synthesis abnormalities caused by liver function abnormalities or excessive serum albumin loss caused by vomiting, diarrhea are more common causes of albumin reduction. Furthermore, albumin is well-known for its numerous physiological functions. It is the most important factor in maintaining plasma colloid osmotic pressure as well as capillary permeability, which can lead to a redistribution of body fluids. Changes in plasma albumin concentration can affect normal homeostasis as well as drug delivery. Scavenging oxygen free radicals; antithrombotic inhibition of platelet function. Prior to surgery, a plasma albumin concentration test and colloid osmotic pressure can be used to estimate tissue edema. So, to improve hypoproteinemia along with weight gain, increased protein and calorie consumption, as well as regular protein supplements could be used to treat patients with protein-losing enteropathy who have edema and hypoproteinemia significantly. Albumin administration may result in lower fluid requirements and reduced pulmonary and intestinal oedema compared to other fluid regimens.^[6]

IV. CONCLUSION

In our study, the patient was diagnosed with Pyothorax and Decortication procedure was done to eliminate pleural effusion with intravenous antibiotics, bronchodilators, supplements and fluids. Despite the advancement in medical practice and rational use of antibiotics, pleural infections are elevating worldwide. Early diagnosis and increased suspicion for pleural infection is considered important for efficient management of infections for better outcome. The main criteria or goal of treatment of empyema includes cleansing the pleural cavity, inhibiting the action of microorganism, piping out the fluid and thereby enhancing the normal functioning of lungs. Retarding the drainage of fluid can lead to further

complications which further can increase the potentiality of mortality and morbidity rates. Therefore, appropriate and timely management with rational use of antibiotics can intercept the occurrences of recurrent infection and thereby reduces the morbidity and mortality associated with the disease.^[7]

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