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Original Research Paper

Pulmonology

BILATERAL CONCURRENT THORACOSCOPIC ADHESIOLYSIS IN THE MANAGEMENT OF COMPLICATED PARA PNEUMONIC EFFUSION: A CASE REPORT

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ABSTRACT Thorns can distribute bacteria and fungi into human skin and motivate disease. Sporotrichosis is an extraordinary infection caused by the fungus Sporothrix. From a rose thorn the fungus enters the skin through a cut, or puncture, and produce infection. Mycetoma occurs when specific fungi or bacteria enter the skin through a puncture, scrape, or cut. Similarly, other thorn pricks produce Septic pulmonary embolism (SPE). Para pneumonic effusion (PPE) is a type of pleural effusion that enhance fluid in the pleural cavity. Principally, streptococcus bacterial infection causes Para pneumonic effusion. Clinicians intermittently experience patients with cancerous diseases involving the pleural space. Barriers from these diseases create challenges which require a multi-disciplinary management. In the Septic pulmonary embolism (SPE), septic thrombi are assembled from an infectious place in the body and on fusion transported to the vascular system and lungs. It presents with deceitful onset and is difficult to diagnose with a wide variety of clinical indications and etiologies. SPE normally related with tricuspid valve vegetation, septic thrombophlebitis or infected venous catheters, skin or soft-tissue infections, dental procedures or periodontal diseases.

KEYWORDS : Traumatic necrotizing fasciitis, methicillin-susceptible Staphylococcus aureus, fasciotomy, septic pulmonary emboli, (ARDS), thoracocenthesis, septic shock, Lemierre syndrome

INTRODUCTION

Septic pulmonary embolism (PE) is a rare disorder that normally presents with fever, respiratory symptoms, and lung infiltrates. Wherever the origin of the organism, the embolism blood clot may lead to a infarction of the pulmonary vasculature and tissue.

Accumulation of exudative pleural fluid with an ipsilateral lung infection, is referred Para pneumonic effusion. (1)

Diagnosing the pleural sign, however, may be confused by coexisting pneumothorax and for patients with chronic obstructive lung disease.

Ultrasonography assists to recognize pleural effusions with the support of thoracentesis guidance (2)

Empyema thoracis is a common benign pathology of the pleural space causing severe morbidity and mortality. Frequently it spreads into from a Para pneumonic effusion (3)

For procuring pleural biopsies, pleuroscopy and video-assisted thoracoscopic surgery are sensible alternatives. (4)

Bilateral VATS should be considered as an achievable and successful course of action for bilateral empyema. (5)

Especially with doubtful malignancy cases, Local anaesthetic thoracoscopy (LAT) is predominant plan of action in the management of pleural effusions. (6)

BACKGROUND

Septic pulmonary embolism is a rare clinical presentation with a insidious onset and a difficult diagnosis. We presented an unexpected cause of septic pulmonary embolism one week after a skin lesion with a thorn prick.

Infection of the blood produces an uncommon but serious complication Septic pulmonary embolism (SPE). Methicillin-susceptible *Staphylococcus aureus* and methicillin-resistant *Staphylococcus aureus*, are the most common causative organisms of SPE.*Pseudomonas aeruginosa* (*P. aeruginosa*) infection also produce SPE. Management of *P. aeruginosa* infection can be challenging due to its poor prognosis and antimicrobial resistance (7)

Bacteria and other microorganisms affect the Para pneumonic effusion.*S. pneumoniae and S. pyogenes* are identified with Complicated pneumonia.

Case presentation

A 27-year-old male, a farmer by occupation, from Nanded, Maharashtra, with no comorbid conditions, presented to our hospital with a history of thorn prick to his left foot 10 days before. The thorn prick was followed by progressive suffering and inflammation of the left lower limb. About 2 days after the onset of the swelling, he started to develop fever, and the swelling and pain worsened. He was managed at a local hospital with intravenous antibiotics, but when his symptoms did not improve, he underwent fasciotomy (1 week after the thorn prick). The patient clinically deteriorated with severe hypoxia even after the surgical intervention and was found to have acute respiratory distress syndrome (ARDS), septic shock, jaundice and elevated liver enzymes. He was shifted to our hospital for further management.

Unfortunately, intraoperative tissue cultures were not obtained during fasciotomy at the hospital. However, a

superficial wound swab was sent for culture which grew methicillin susceptible Staphylococcus aureus. Laboratory investigations at the outside hospital were showed neutrophilic leucocytosis with left shift, thrombocytopenia, and hypoalbuminemia.

In the emergency room (ER) of our hospital, the patient was critically ill with severe hypoxia. The pulse rate was 120/min, blood pressure 90/60 mm Hg, respiratory rate- 32/min, and oxygen saturation of 100% on 3 liters oxygen via nasal cannula. A lower limb venous Doppler manifest confirmation of deep vein thrombosis involving left popliteal vein and posterior tibial vein. The patient was started on therapeutic anticoagulation with enoxaparin. Chest X-ray reveal bilateral parenchymal alveolar opacities suggestive of ARDS. Other possibilities considered were bilateral pneumonia and septic emboli. The hypotension did not respond to fluid resuscitation, and the patient was started on vasopressor support with noradrenaline. He was started on broad-spectrum empiric antibiotic therapy with meropenem and teicoplanin. He also had severe thrombocytopenia with a platelet count of 48000 cells/ mm

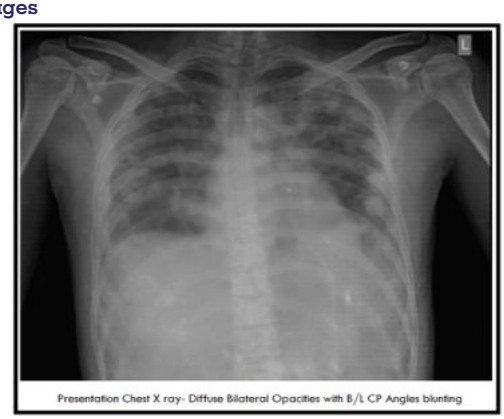
Bronchial wall solidity can be noticed on lung CTs and generally suggested inflammation of the bronchi.(8)

A computerized tomography (CT) pulmonary angiogram showed multiple, well-defined nodules of variable sizes noted in bilateral lung fields predominantly in the sub pleural location of lower lobes with patchy bilateral consolidation and bilateral ground-glass opacities. Bilateral loculated effusion was also noted on the CT chest. 50 ml of pleural fluid was aspirated from both sides. Pleural fluid analysis on the right side revealed a pleural fluid pH of 7.17, LDH of 625 IU/ml, a pleural fluid protein of 3.3 gm%, glucose of 63 mg% with total WBC counts of 12000 cells/mm 3 (90% neutrophils); on the left side pleural fluid pH was 7.15, protein was 3.2 gm%, LDH was 521 IU/ml (serum LDH was 255 IU/ml), glucose was 109 mg% with total WBC counts of 14000 cells/mm

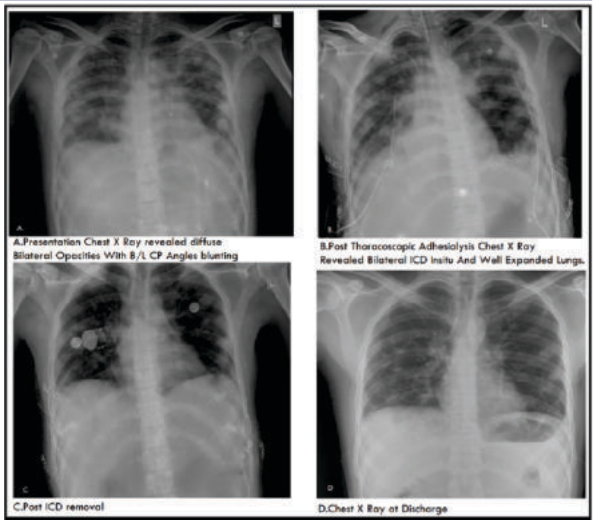
The serum protein, serum LDH, and capillary blood glucose were 5 gm%, 255 IU/ml, and 180 mg% respectively at the time of thoracentesis. Two sets of blood cultures procured at admission were sterile.

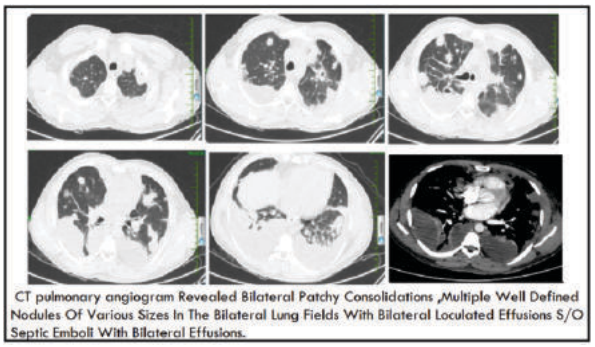
Given bilateral Para pneumonic effusion necessitating drainage for source control, the patient underwent bilateral concurrent video-assisted thoracoscopic adhesiolysis plus drainage. Bilateral intercostal chest drains were placed. Anticoagulation was withheld in the immediate pre-operative period given the risk of bleeding but was restarted promptly followed the intervention. The cultures of pleural fluid and specimens sent during the thoracoscopic adhesiolysis did not grow any pathogenic bacteria. The patient made a full recovery post-operatively and is asymptomatic on follow-up.

Images

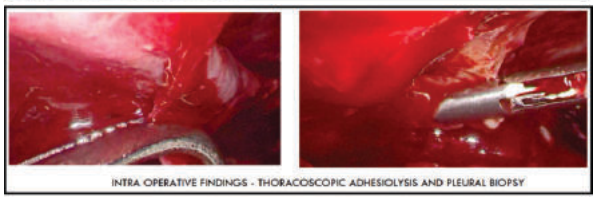


Presentation Chest X ray- Diffuse Bilateral Opacities with B/L CP Angles blunting





CT pulmonary angiogram Revealed Bilateral Patchy Consolidations ,Multiple Well Defined Nodules Of Various Sizes In The Bilateral Lung Fields With Bilateral Loculated Effusions S/O Septic Emboli With Bilateral Effusions.



INTRA OPERATIVE FINDINGS - THORACOSCOPIC ADHESIOLYSIS AND PLEURAL BIOPSY

DISCUSSION

This patient presented with a necrotizing soft-tissue infection following a thorn prick. Because of necrotizing fasciitis, he had undergone fasciotomy elsewhere. His immediate postoperative course was turbulent with severe hypoxia, shock, jaundice, and hepatitis. At this point, he was shifted to our medical center for further management. CT chest imaging suggested multiple sub pleural nodules with patchy bilateral consolidation and bilateral loculated pleural effusion.

Given the clinical features and CT findings of multiple pulmonary nodules plus the evidence of an exudative effusion on both sides, the patient was thought to have septic pulmonary emboli and bilateral complicated Para pneumonic effusion.

Septic pulmonary embolism (SPE) is a extraordinary ataxia bring about by metastasis of infectious thrombi to the lungs (9)

The management of lung abscess is challenge in aged patients experiencing chemotherapy and/or radiotherapy for preceding malignancy. (10)

Empyema necessitans (EN) is a extraordinary occurrence that mention to deceitful extension of the empyema through parietal pleura (11)

In one study, the most common etiological agent causing pleural infections (Para pneumonic effusion/ empyema) was Staphylococcus aureus. Septic pulmonary emboli are most frequently seen in intravenous drug users who develop right-

sided endocarditis. Acute pulmonary embolism (APE) is distinguished by numerous clinical expressions which are the result of a composite interplay between different organs. (12)

Many fatal pulmonary emboli remain unrecognised due to the lack of routine postmortem examinations leading to an underestimation of their incidence

Numerous patient- and hospital-related variables that affect morbidity and mortality also affect whether a patient undergoes VATS or open lung resection. (13)

In a single centre study from South Korea, medical thoracoscopy was used for the medicament of empyema in 13 patients over two years. It was also used diagnostically, and the most common diagnosis in the study was malignant pleural effusion (14).

In the study previously quoted of 14 subjects with septic pulmonary emboli over six years, only one patient experience thoracoscopic surgery with decortication.

In our patient, malignant pleural effusion and TB pleuritis were considered unlikely due to the clinical presentation and results of thoracentesis.

The most likely diagnosis was a complicated para-pneumonic effusion.In one clinical study. video thoracoscopy (VTS) and video-assisted thoracoscopic surgery (VATS) was found useful in stage II empyema. VATS was found to be a comparable alternative to thoracotomy for decortication in early-stage III empyema

VATS has progressively replaced open thoracotomies in most thoracic surgery centers around the world because of its safety profile in elderly patients. (15)

VATS (video-assisted thoracoscopic surgery) uses miniature surgical cuts than conventional lung surgery. It a shorter invasive procedure amidst a quicker recovery (16)

Physician recommend VATS to gain access to your chest cavity (aka the thorax), especially the heart and lungs. They may do this to check the area for problems such as tumours, to get hold of a sample of tissue, or to do surgery.

In a recent study, utilizeing of video-assisted thoracoscopic surgery (VATS) in the early stages of empyema reduced duration of hospital stay, costs, complications and reduced need for conversion to thoracotomy for open drainage and decortication.

VATS is chiefly engaged in the management of pulmonary, mediastinal, and pleural pathology. Its foremost benefit is the escape of a thoracotomy incision, which allows a shorter operating time, and less postoperative morbidity. (17) A review of 128 patients by Chung et. al showed that early VATS (< 4 weeks between the onset of symptoms and time of surgery) had better outcomes in terms of number of days required for chest-tube drainage, intra-operative duration, postoperative hospital stay, and postoperative air leaks compared to patients who experience VATS after 4 weeks of symptoms onset.

The administration for fibrinolytic agents aiming for promoting the drainage of the loculated Para pneumonic effusion is controversial (18)

The period of antibiotic therapy bank on the sensitivity of the organism, pulmonary parenchymal and pleural disease, and adequacy of drainage (19)

Intrapleural fibrinolytic therapy has shown statisticallynoteworthy in treatment of empyema and problematic pleural effusion reduction in surgical intervention. (20)

The challenge, in this case, was the perioperative management of the anticoagulation (enoxaparin) being administered due to the lower limb DVT. Guidelines recommend stopping the low-molecular-weight heparin 24 hours before surgery given a half-life of 3-5 hours and restarting it after 24 hours if the procedure is deemed to be of minor bleeding risk

CONCLUSIONS

This is a case of septic pulmonary emboli (secondary to deep venous thrombosis) and bilateral complicated Para pneumonic effusion complicating a left lower limb necrotizing fasciitis secondary to a thorn-prick. The patient made a dramatic recovery following bilateral concurrent thoracoscopic adhesiolysis and drainage via video-assisted thoracoscopic surgery (VATS). To our knowledge, this is the first case where bilateral concurrent thoracoscopic adhesiolysis via VATS has been used for a complicated Para pneumonic effusion. Vigilant critical care monitoring, systemic antibiotics and judicious therapeutic anticoagulation contributed to the patient's recovery.

Summary

Clinicians must be vigilant regarding how to identify septic pulmonary embolism based on appropriate history, physical examination, and imaging studies. VATS carries a vital role in the identification and management of complicated para-pneumonic effusion.100 years ago thoracoscopy was inaugurated. Earlier, it is mainly used in the pneumothorax treatment of tuberculosis.

Pleuro-pulmonary adhesions prevented collapse of the lung in TB cases. In these cases, thoracoscopy is advantageous. Several pleuro-pulmonary diseases were diagnosed by chest physicians by thoracoscopy as diagnostic and curative method.

Forgoing studies showed that slowdown for referral for thoracoscopy more than two weeks was correlated with failure of thoracoscopy and changing to thoracotomy (21)

Video-assisted thoracoscopic surgery (VATS) has revolutionized the approach to and management of many pulmonary and cardiac diseases over the past two decades (22)

Over the past 20 years, management of many pulmonary and cardiac diseases were carried out by Video-assisted thoracoscopic surgery (VATS) approach

The period of antibiotic therapy bank on several factors, like the sensitivity of the organism, pulmonary parenchymal and pleural disease, feedback to therapy. (23)

Notes of patient consent-

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