



Case Report

COVID 19 Pneumonia with Massive Tubercular Lung Empyema: Challenges in Diagnosis & Management

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Background

COVID 19 Pandemic as a Acute viral syndrome has many challenges in early diagnosis as well as appropriate management in time. As the pandemic is progressing we are seeing new challenging cases everyday whether it is related to comorbid issues, difficulty in diagnosis, difficult radiological interpretation or difficult clinical judgement. Early intervention and diagnosing atypical cases can lead to reduction in mortality in this pandemic. In the present case report, we report a successful management of a patient with chief complaints of fever, dyspnea and cough with expectoration since 5 days with COVID RTPCR positive. She was incidentally found to have a left side massive empyema on chest xray and further Evaluation. Following thoracocentesis, she was diagnosed to have underlying tubercular empyema. Therapeutic thoracocentesis resolved the empyema. At follow up, patient is better and have complete re expansion of the lung tissue.

Case Presentation

A 55 years old female patient presented with a positive COVID 19 RTPCR and complaints of fever, dyspnea and cough with expectoration from 5 days. Patient was a known case of Hypertension and was on regular treatment and had no contacts with any COVID infected patients. Good socio economic status with no family history of tuberculosis.

On general examination, she was moderately built and nourished (BMI:20.4 kg/m²), was oriented to time, place and person and was able to converse comfortably. Her vitals at the time of presentation were as follows: Heart rate 98beats/ min, blood pressure 150/90 mmHg, respiratory rate 24 breaths/min and saturation was 92% to 94 % on room air.

On systemic examination, she had decreased breath sounds over all lung fields in the left side with normal vesicular breath sounds heard over right side. Cardiovascular examination, Abdominal examination nothing significant.

Investigations

Laboratory datas were significant of underlying infection with a total leucocyte count of 15,420 with 88 % neutrophils, 7% lymphocytes, Haemoglobin 10.4 g/dL, and platelet count $327 \times 10^9/L$. Her Kidney function test reports were within normal ranges, blood urea nitrogen 50 mg/dL, creatinine 0.96 mg/day, serum Sodium 132 mEq/L and total serum protein 5.9 gm/dL. Her Alkaline phosphatase was 215 IU/L with the remaining liver enzymes within normal limits. Her coagulation profile was within normal. Viral markers were negative. Her ECG showed normal sinus rhythm.her ABG PH 7.4 PaO₂ 86 Pco₂ 34 Hco₃ 22 Lactate 1.8.

The chest Xray on presentation showed a mediastinal shift to the right due to large effusion that occupied the entire left hemithorax (Picture-1). A HRCT scan of the chest showed deviation of mediastinum to the right, pleural fluid collection occupying the entire left hemithorax.

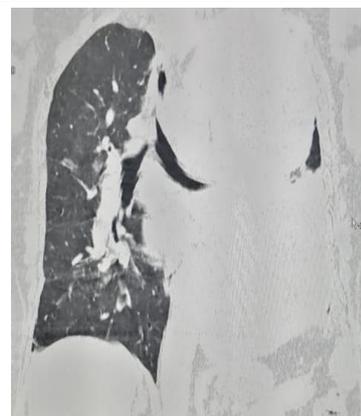
Bedside ultrasound showed a loculated pleural effusion on the left side. A chest tube was placed that drained 1500 ml of yellow turbid, pleural fluid immediately. The characteristics of the pleural fluid are described in table 1.



A



B



C

Picture 1 (A) Chest X ray PA view at presentation revealing a large effusion occupying entire left hemithorax. (B)HRCT chest axial view in the lung window. (C) HRCT chest coronal view confirms a large pleural effusion in left hemithorax ? empyema.

Treatment

Patient was started on empirical antibiotics, Steroids, Anticoagulation therapy and all other supportive symptomatic treatment with oxygen therapy by face mask .Following the diagnostic thoracocentesis , the chest tube was placed connected to under water seal and watched closely, monitored to avoid surgical emphysema and reexpansion of pulmonary edema. After draining an additional 800 ml of fluid a repeat chest xray showed residual moderate pleural fluid collection on the left lung base and improving aeration of the upper left lung (Picture 2). On the basis of fluid analysis and Adenosine Deaminase (130) level higher than the normal range patient was started on Antitubercular treatment according to DOTS regimen.

Table- 1

PLEURAL FLUID ANALYSIS	RESULT
Colour	Yellow, turbid
pH	6.0
Glucose	38 mg/dl
Total Protein	1.4 gm
Albumin	0.8 gm/dl
ADA	114 IU/L
Aerobic Culture	GNB - Klebsiella

Outcome and Follow Up

Following recovery from the pleural fluid draining, our patient was discharged to a non COVID facility. She completed a course of 2 weeks antibiotics during hospital stay followed by 1 week of more antibiotics at home. On teleconsultation she reported to be feeling better and no significant breathlessness or complaints.

Discussion

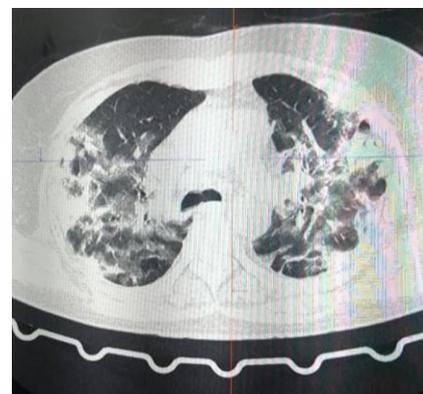
There are not many case described in COVID 19 disease infection with complication as pulmonary abscess. COVID 19 disease with tubercular lung abscess along with gram negative infection in a short clinical history course makes it a challenging clinical diagnosis. Significant hypoxia, hypoxemia is not evident on presentation with severe lung involvement in COVID disease which is very unlikely. There is no significant respiratory distress or tachypnoea despite such a bad lung of the patient. We should always consider two diagnosis over and above COVID infection. Pleural empyema is an uncommon but serious condition defined by infected fluid in the pleural space. These patients are often given long courses of empirical broad-spectrum antibiotics as the yield from conventional culture methods is notoriously low. The literature shows that with conventional culture methods of the pleural fluid up to 40-60% of causative pathogens remain unidentified.^[3] The pleural space contains approximately 10-15 ml of pleural fluid to

overcome the friction between the pleura and the lung during respiration. With the onset of an infection, there is an increase in proteins, white cell count, predominantly neutrophils, in the pleural fluid. As the infection progresses, bacteria may invade the pleural space resulting in fibrin deposition and loculation formation, resulting in empyema. Over time the pleural fluid can organize further, resulting in fibrinous layer that envelopes the lung and prevents lung expansion when fluid is removed. Due to gradual respiratory compensation of this process patients can be asymptomatic at presentation.^[4]

The imaging of choice at presentation is an X-ray. After an initial Xray, the next step would be bedside ultrasound to measure the pocket of pleural fluid collection as well as thoracentesis for diagnostic and therapeutic purposes. After placement of chest tube, a repeat chest Xray is required to confirm the location of catheter tip in the pleural space. A statement from the British Society of Thoracic Imaging suggests that “bilateral, subpleural ground glass opacity, ill defined margins, and a slight right lower lobe predilection” are the most common initial computed tomography findings of COVID-19 pneumonia.^[5] The statement also suggests that, with disease progression, findings can range from “focal unilateral abnormality to diffuse bilateral opacities,” and might evolve to “consolidation, empyema, reticulation, and mixed pattern disease.”



A



B



C.

Picture 2 Radiographic findings on day 4 following chest tube drainage. (A)The chest Xray AP view reveals a decrease in size of left pleural effusion. (B) Axial view of the chest HRCT scan in the lung window. (C) Coronal view of the HRCT chest showing clearing of empyema and aeration of upper lobe

Conclusion

Clinicians taking in COVID pandemic needs to be more vigilant for complications, co infections, two etiologies together, COVID sequelae Patients with long standing empyema might be asymptomatic at presentation and presence of risk factors should prompt evaluation using a chest radiograph and further evaluation.

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