



## **Surgical Thoracic Decortication in a COVID 19 Patient with Loculated Pleural Empyema**

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**Received Date: May 27, 2022**

**Published Date: June 10, 2022**

**Patient:** Male, 55-year-old Male

**Final Diagnoses:** Pleural effusion, pneumonic effusion, pleural empyema, decortication

**MeSH Keywords:** Pleural effusion, Lung Pleura Trapped lung

**Objective:** Unusual clinical course

## Background

Decortication is a surgical procedure that allows one to remove proteinaceous deposits that form around the lung. This fibrous tissue overlying the lung, chest wall and diaphragm can cause the lung not to expand. Patient may develop dyspnea and decreased exercise tolerance. The definite therapy to resolve this condition is decortication. The most common cause of lung entrapment includes malignant pleural effusion, complicated parapneumonic effusions and endobronchial obstruction that causes pneumonia with atelectasis. Pleural effusion in a COVID 19 patient is rare. We present a rare case of the decortication of a COVID 19 patient that survived acute hospitalization but subsequently develop pleural empyema. Despite chest tube, thoracotomy and drainage, the patient required decortication which is a more definitive treatment of this condition. There have been a handful of cases reported in the literature of pleural empyema after bilateral COVID 19 pneumonia. They usually present with many challenges, requiring mechanical ventilation, chest tube, thoracoscopy and drainage. Decortication is still a more definite way for therapy and can be useful to resolve this emergent complication.

## Case

55-year-old male with history of COPD, hypertension, cardiac disease. Patient came to the emergency room with dyspnea, cough, and SOB. Patient was found to be hypoxic and started on 5 liters of oxygen. Rapid PCR for COVID 19 was positive CXR found bilateral ground glass changes. The C reactive protein was 175 mg/l, WBC 11, 000. His vitals were pulse of 105, respiratory rate of 13, O2 saturation of 85% in room air. He had some rales on exam. Patient was admitted to a COVID medical floor, he was treated with Remdesivir, dexamethasone, vancomycin and meropenem. Patient was found to have a pleural effusion on the right side of the hemithorax. The Fluid analyses showed a LDH of 1980, and total protein of 450. Initial gram stain was negative and fluid pH of 7.21. Fluid was consistent with exudative effusion and suggested empyema. We decided to do a decortication to clean and expand the trapped lung and to evacuate purulent material. There was an increase of inflammation indexes.

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The goal was to liberate the lung and to clean the purulent fluid which turned to be negative at microbiological cultures and gram stain. Post procedure the patient improved, he tested negative for COVID 19, five weeks later. Patient recovered well without any additional complications.

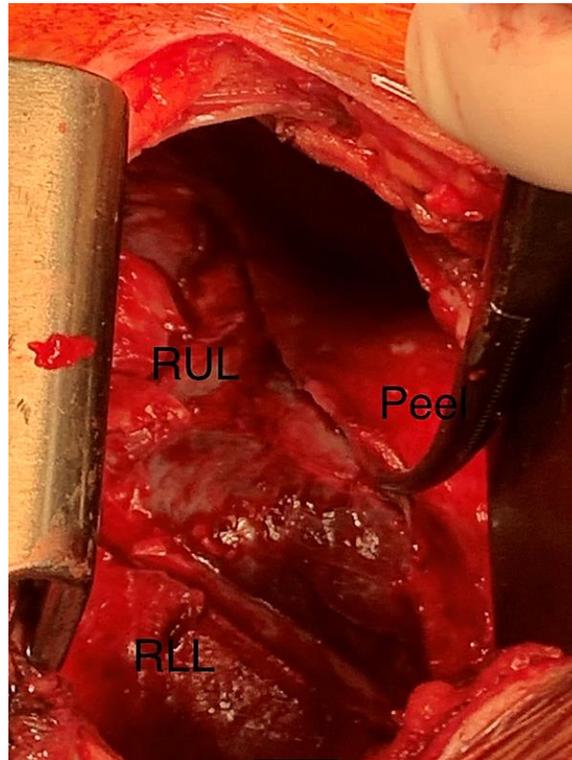


Image of decortication. Right Upper Lobe and Right Lower Lobe are visualized

### **Discussion**

Pleural effusion is a very uncommon complication of COVID 19. Several case series have been reported but with very low numbers. Anything that causes inflammation and increases production of fibrinous material or impairs reabsorption through the lymphatic system will increase the production of pleural proteins and fluid. COVID 19 creates a very pro-inflammatory state. The virus promotes a strong inflammatory response with a large inflammatory cytokine release and direct damage of the alveolar epithelium. The body is fighting a highly viral infection, with an increased likelihood of a super infection, in addition the body has a lack of mobility promoting the production of pleural fluid.

We propose considering decortication as a surgical alternative for these patients. It is a relative benign procedure that can be performed through a video assisted thoracoscopy. Thoracic empyema and pleural effusions can also be treated by drainage catheters. Nevertheless, non-operative management with prolonged infection can increase the risk of mortality, sepsis, and morbidity.

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## Conclusion

This is an uncommon presentation of COVID 19 causing pleural space infection. It is important to follow radiologically and evaluate markers of inflammation. As more patients survive this disease, prompt follow up with outpatient radiography is recommended. Always consider decortication to treat pleural empyema and prevent long term negative sequelae such as a trapped lung or sepsis.

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