

# Surgical therapy for complications of pneumonia on extracorporeal membrane oxygenation can improve the ability to wean patients from support

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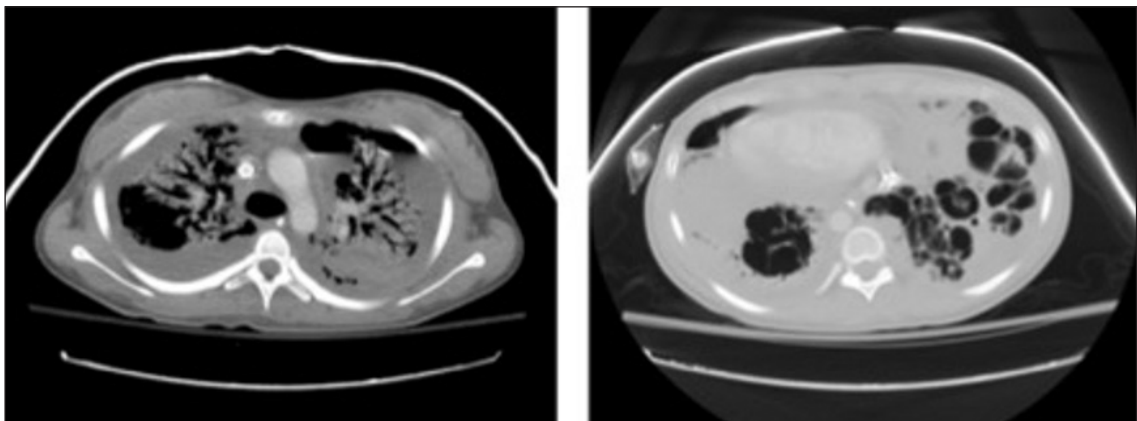
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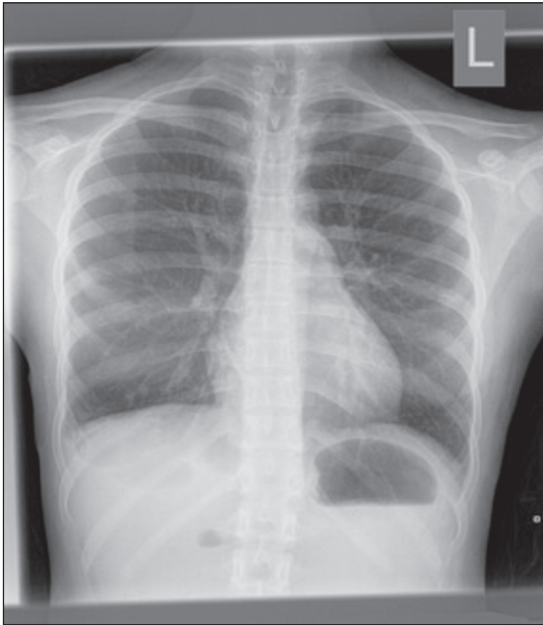
Extracorporeal Membrane Oxygenation (ECMO) is used in both children and adults to provide sufficient gas exchange

until pulmonary parenchymal complications of pneumonia can heal (1). The natural history of severe pneumonia can result in formation of empyema and abscess, as well as lung necrosis and cystic disease that can compress the normal parenchyma. In



**Figure 1** - a) Axial image from a chest CT showing severe bilateral upper lobe consolidation with numerous air bronchograms, a loculated left hydro-pneumothorax and a loculated right pleural effusion. An ECMO cannula in the SVC is noted. b) A more caudal axial image demonstrates widespread cystic destruction of the lower lobe parenchyma representing necrosis. CT = computed tomography; ECMO = extracorporeal membrane oxygenation; SVC = superior vena cava.

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**Figure 2** - Posteroanterior chest X ray one year after discharge shows only minimal residual pleuroparenchymal scarring at the right lung base.

severer cases, these complications will not improve without surgical intervention. Patients on ECMO, who experience these complications, face additional risks for surgical treatment due to the requirement of anticoagulation.

We present two patients on ECMO treated for pneumonia refractory to medical therapy. Both patients had anticoagulation held prior to surgery, and both were restarted on heparin drips 24 hours after their resection. Anticoagulation was managed solely based on the Anti Factor Xa Assay, as per proto-

col (2). To our knowledge, this is the first report of pulmonary parenchyma resection secondary to pneumonia treated surgically for patients on ECMO.

Two patients (ages 13 and 17 years) were transferred to our institution with severe necrotizing pneumonia and clinical sepsis. Both developed respiratory failure refractory to medical therapy and both were being treated with escalating inotropes for sepsis when they were cannulated for ECMO. As they recovered end organ function on ECMO, their pulmonary processes matured. Pulmonary infarct, abscess formation and cystic degeneration are demonstrated on imaging studies (*Figure 1*).

Due to a prolonged failure to wean from ECMO support, bilateral thoracotomies were performed on each for abscess drainage, debridement of necrotic tissue, and resection of air/space cystic lung disease. One patient was extubated within 48 hours, and one within 10 days of their procedure. Each was eventually discharged home and was able to return to school. Follow-up chest radiograph showing near-complete resolution demonstrates the success of our endeavors (*Figure 2*).

## REFERENCES

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