

Title: Successful Video Assisted Thoracoscopic Surgery (VATS) of Empyema and Parapneumonic Effusion in a Pregnant Patient in the setting of Polysubstance Abuse and Recent Opioid Overdose

Authors: Sai Nagula, BS, MPH¹, Anthony B. Royek, MD, FACOG²

Affiliations: 1. Mercer University School of Medicine; 2. Memorial Health University Medical Center, Department of Obstetrics & Gynecology

Background: Patients with a history of opioid overdose and polysubstance abuse are prone to lung insults such as pneumonia, pleural effusion, and empyema, most commonly through aspiration while in a sedated state. Pregnant patients who develop such pulmonary complications have higher risks for morbidity and mortality when compared to non-pregnant patients. The diagnosis of effusion and empyema may be challenging, and therapeutic options range from antibiotics, chest tube placement, intrapleural fibrinolytic therapy, and video-assisted thoracoscopic surgery (VATS).

Objective: We present a case and resolution of a pregnant patient at 28 weeks of gestational age who presented with a cough and sternal pain in the setting of a fentanyl overdose that developed a left parapneumonic effusion and empyema.

Case Report: A 24-year-old G5P1031 Caucasian female at 28 weeks EGA presented to the ED with coughing and sternal pain. She reported the pain began one week prior, when she overdosed on fentanyl, lost consciousness and received chest compressions from a witness, followed by naloxone administration from EMS. UDS was positive for methamphetamines. She had no prior prenatal care. PMH was significant for multiple prior pneumonias in the setting of drug overdose. Physical exam was significant for hypotension and tachycardia. Given her IV drug use history and pregnancy status, there was concern for pulmonary embolism, bacteremia, and infectious endocarditis. A CXR, CTPE, and TEE were initially ordered and were unremarkable, except for ground-glass attenuations on the CTPE - consistent with an infectious process. After the patient was admitted to the High-Risk Obstetrics service, she continued to complain of left-sided flank and LUQ pain. The patient adamantly denied recent substance abuse. Methadone was administered, pain and anxiety management were initiated and a CIWA protocol was started. Due to worsening leukocytosis, repeat CT imaging was obtained, revealing a newly developed left pleural effusion and consolidation in the left lung. Cardiothoracic (CT) surgery was consulted, and a left chest tube was placed to drain the empyema, resulting in immediate drainage of 700cc of purulent serosanguinous fluid. Fluid cultures grew Gram-positive cocci in chains/pairs, and antibiotics were started. Given the complexity of the case, Infectious Disease, Pulmonology and Pharmacology were also consulted. Over the next few days, worsening leukocytosis, continued left-sided pain, and a sharp decline in further drainage from the chest tube prompted more aggressive therapy. Intrapleural fibrinolytic therapy and video-assisted thoracoscopic surgery (VATS) were considered for treatment. Ultimately, VATS was recommended for decortication and drainage of the empyema, successfully performed on hospital day 5. During the procedure multiple loculations surrounding the left lung were removed, the left fissure was mobilized, and two new chest tubes were placed. Fetal monitoring was reassuring throughout the entire hospital course, and after stabilization, the patient was discharged home to complete a course of antibiotics.

Conclusion: Empyema occurs in about 8% of all cases of pneumonia in pregnancy. There are few documented cases of treatment of empyema in pregnant patients. There are 6 case reports

to date that suggest the use of intrapleural fibrinolytic therapy as an alternative to surgery. However, this is based on case reports and not randomized controlled trials. There are relative contraindications to fibrinolytic therapy and considering this, our multidisciplinary team of CT Surgery, Pulmonology and Maternal-Fetal Medicine opted for VATS. To our knowledge, this is the first case of using VATS to treat a parapneumonic empyema in a pregnant patient in the setting of polysubstance abuse. Given the significant morbidity and mortality risks for the patient as well as the fetus, prompt diagnosis and treatment utilizing antibiotics, chest tubes and VATS proved to be efficacious and safe.