

Enterococcus faecalis: An Unusual Cause of Thoracic Empyema

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CASE PRESENTATION

Initial Presentation and History

An 80-year-old white man presented with a 2-week history of right-sided pleuritic pain and dyspnea. He also reported fever with chills, anorexia, and significant weight loss, with no cough or sputum production. The patient's past medical history was remarkable for coronary artery disease, hypertension, hyperlipidemia, and chronic obstructive airway disease. He underwent coronary artery bypass graft surgery with mitral valve repair in the remote past. Three months prior to presentation, the patient underwent laparoscopic cholecystectomy for gangrenous cholecystitis. His current medications included atenolol and aspirin. There was no history of smoking, drug abuse, or exposure to toxins and fumes.

Physical Examination

On physical examination, the patient's vital signs were stable. He had a temperature of 100°F (37.8°C). His chest was dull to percussion at the base of the right lung with diminished breath sounds. The rest of the examination was unremarkable. A chest radiograph showed a right pleural effusion (Figure 1). Laboratory data were notable for an elevated leukocyte count of $14,000 \times 10^3/\mu\text{L}$ (normal, $4000\text{--}10,800 \times 10^3/\mu\text{L}$), polymorphonuclear leukocytosis, and an erythrocyte sedimentation rate of 64 mm/h (normal, 0–15 mm/h). The hemoglobin, platelet count, basic metabolic profile, and hepatic function panel were all within normal limits.

Diagnostic Testing and Treatment

The pleural fluid aspirated from the right hemithorax was an exudate. Culture of the pleural fluid on 2 occasions grew *Enterococcus faecalis* that was sensitive to ampicillin and vancomycin. No malignant cells were identified. Blood and urine cultures did not show any growth. Computed tomography (CT) scan of the chest revealed asymmetric bilateral pleural effusions with sec-

ondary atelectasis. No masses or lymph nodes were identified (Figure 2).

As *Enterococcus faecalis* is an unusual cause of empyema, further investigations to determine the primary focus were undertaken. CT scan of the abdomen showed a $26 \times 24\text{-mm}$ mass in the right pararenal area (Figure 3). A CT-guided needle biopsy of this mass revealed mixed acute and chronic inflammatory cells; no malignant cells were identified. Transesophageal echocardiogram ruled out prosthetic valve endocarditis. The patient underwent bilateral decortication surgery, and chest tubes were placed for drainage of empyema. After 8 weeks, his empyema resolved (Figure 4), his symptoms improved, and his chest tubes were removed. Based on the pleural fluid culture report, the patient was started on oral amoxicillin. Amoxicillin was continued for 12 weeks. A repeat CT scan of the abdomen 8 weeks later showed that the right pararenal mass had resolved, suggesting a non-neoplastic process.

DISCUSSION

Thoracic empyema is defined as the presence of pus in the pleural cavity. It is usually associated with fever and leukocytosis. The most common organisms isolated from the pleural fluid are *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Haemophilus influenzae*, *Escherichia coli*, *Klebsiella pneumoniae*, and *Bacteroides* species.¹ *Enterococcus faecalis*, however, is a rare cause of empyema. Enterococci, which ordinarily reside within the bowel flora, are an important cause of serious nosocomial and, less commonly, community-acquired infections. In an observational study involving 110 patients infected

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Figure 1. Chest radiograph of the patient taken on admission revealing a right pleural effusion.



Figure 2. Computed tomography scan of the patient's thorax revealing bilateral pleural effusions.

with *Enterococcus* species, *Enterococcus faecalis* affected the heart, abdomen, and kidneys in 80% of the cases; the reported incidence of pleuropulmonary infections was 4%.² *Enterococcus faecalis* accounted for 80% to 90% of pleuropulmonary infection cases.

This pathogen has been uncommonly associated with nosocomial pneumonia in severely debilitated patients and those on broad-spectrum antibiotics.^{3,4} There are approximately 30 cases of enterococcal empyema reported in the literature.^{1,5–8} In only 2 of these cases was a definite extrapulmonary source of infection identified, although there are some case reports of *Enterococcus faecalis* empyema in patients with liver cirrhosis. In some of these cases, empyema occurred in the absence of underlying pneumonia or peritonitis and was termed “spontaneous bacterial empyema.”⁶



Figure 3. Computed tomography scan of the patient's abdomen revealing a right pararenal mass.



Figure 4. Chest radiograph of the patient taken 3 months after treatment demonstrating resolution of thoracic empyema.

Exudative pleural effusions may infrequently complicate laparoscopic cholecystectomy.^{9–18} Gallstones that are spilled during the procedure can erode the diaphragm, leading to empyema and gallstone abscess formation many months later. However, most of the empyemas in these case reports were sterile, and none of the culture-positive empyemas were due to enterococcus.¹¹

Our patient underwent a laparoscopic cholecystectomy for a gangrenous gall bladder. He did well for the

next few months, until he was found to have bilateral empyemas. *Enterococcus faecalis* was cultured from the fluid. He was treated with amoxicillin for almost 12 weeks and required bilateral decortication and chest tube drainage. Imaging studies did not show any spilled gallstones or subphrenic fluid collections. However, these studies showed a right pararenal inflammatory mass that resolved with antibiotic treatment. It is unclear whether empyema in this patient was a complication of the surgical procedure or whether it was transdiaphragmatic spread or bacteremia from his gangrenous gall bladder that developed slowly and became apparent 3 months after the cholecystectomy.

CONCLUSION

Enterococcus faecalis rarely causes respiratory tract and pleural space infections. There is a limited number of case reports in the literature discussing enterococcal empyema as a delayed complication of laparoscopic cholecystectomy, and most cases occurred primarily in patients with liver cirrhosis. To our knowledge, this is the first case of enterococcal thoracic empyema occurring as a complication of laparoscopic cholecystectomy reported in the literature. **HP**

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