Editorial

Editorial on "current state of empyema management"

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The word "empyema" means "a bag of pus" originated from the Greek word "empyein". In contemporary practice, empyema often referenced to empyema of the chest or empyema thoracis. Surgical principles of empyema management include evacuation of pus and surgical treatment of the dead space by expansion of the lung. Occasionally, surgical procedures such as thoracoplasty and other measures are utilized to eliminate the dead space.

Pleural infection is a frequent clinical condition with an approximate annual incidence of 80,000 cases in the UK and USA combined (1,2). The mortality rate from pleural empyema ranges between 6–25% (3). The development of empyema in association with pneumonia is a progressive process which has previously been classified into three stages: exudative (stage 1), fibrinopurulent (stage 2), and organizing phases (stage 3) (4).

Historically, early stage empyema was managed with tube thoracostomy, with more advanced stages requiring open thoracotomy and decortication. Both the current American Association for Thoracic Surgery (AATS) and British Thoracic Society (BTS) guidelines recommend tube thoracostomy and antibiotics for early stage empyema (5,6). Regarding intrapleural fibrinolysis via tube thoracostomy, there is no indication for their routine use (1,5-7). The Multicenter Intra-pleural Sepsis Trial, MIST1 (8) reported no benefit of intrapleural fibrinolysis, and this was further validated via a Cochrane meta-analysis (9). A follow-up trial, MIST2, demonstrated reduced frequency of surgical referral and duration of hospital stay with the use of tissue plasminogen activator and DNAase (10), however the specific role of such agents remains undefined with mixed data regarding subsequent need for operation (11). It is likely that there is some role for tissue plasminogen activator and DNAase combination therapy for utilization in patients unsuitable for surgical intervention.

In 2015 the European Association for Cardio-Thoracic Surgery (EACTS) published a consensus statement recommending video assisted thoracoscopic decortication (VATS) with early conversion to open thoracotomy in cases where there is no resolution of later stage empyema, or in cases where there has been failure to achieve lung expansion (1). This recommendation is once again mirrored by both current AATS and BTS guidelines (5,6). Interestingly, a retrospective review conducted in 2013 found that prolonged delay from diagnosis to operation, the presence of fever, and pleural thickness on computed tomography (CT) imaging were all significant risk factors that can be used to assess the likelihood of conversion to thoracotomy (12,13). In either case, VATS remains the technique of first choice for the treatment of pleural empyema when the disease is advanced or tube thoracostomy fails. In another retrospective review of 120 patients, it was found to provide a low level of invasiveness and considerably reduced the need for conversion to thoracotomy (14).

Recently, a query of the Healthcare Cost and Utilization Project New York State Inpatient Database from 2009 to 2014 for patient with primary empyema and subsequent readmissions was performed (15). This paper's cohort included 4,095 patients categorized into three groups by definitive treatment during initial hospitalization: thoracostomy drainage, VATS decortication and drainage, or open thoracotomy and drainage. The authors found

that higher readmission rates and reintervention rates were observed in patients managed conservatively with tube thoracostomy, suggesting that some of the patients may benefit from earlier definitive surgical intervention. This suggestion however, may conflict with the fact that nonsurgically managed patients had significantly higher rates of major medical comorbidities, and may not have been candidates for surgical intervention. Unfortunately, fibrinolytic usage could not be accurately assessed with the dataset utilized, and therefore it is unclear whether adequate drainage failed in patients who underwent a trial of fibrinolytic therapy with the intent of avoiding an operation.

The authors also found that 30-day mortality ranged from 5.4–18.3%, these findings are congruent with previously published studies (3). Additionally, a large percentage of surgically managed patients also required multiple procedures during index hospitalization, and that patients with multiple procedures have high rates of readmission at both 30 and 90 days. These facts highlight the complexity of empyema management and can be used to make the argument that a thoracic surgeon should be involved in the care of patients hospitalized for empyema. Unfortunately, the study was unable to comment on the quality of care delivered between surgeons. It is probable that some of the surgical interventions were performed by general rather than thoracic surgeons, which likely could have affected some of outcomes of the study (16). Differences in outcomes would probably be amplified in alternative region of the USA where patients have less access to specialized surgical care.

In conclusion, pleural empyema is a complex disease that occurs in differing stages across a spectrum of the disease development process. Early empyema and nonsurgical candidates can likely be treated with some combination of thoracostomy drainage and fibrinolytic therapy; reintervention rate will likely remain high. Later stages of empyema should be treated with VATS decortication and drainage, with conversion to thoracotomy if necessary. The retrospective multi-institutional review provides insight into the care of patients with empyema and can be used to make the argument that thoracic surgeons should be involved upon diagnosis. Differing outcomes are probable in alternative regions of the US where patients have less access to specialized care. Selection of the surgical management of empyema should be based on the stage of the disease, status of the underlying lung, and comorbidity of the patient.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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