Electric Suction-Lavage Device for Video-Assisted Thoracoscopic Surgery Treatment of Empyema and Hemothorax

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We describe the use of an electric trigger-controlled suction-lavage device for the evacuation of empyema or clotted hemothorax. Wound debridement systems provide efficient irrigation and debris removal. It is frequently used for orthopedic procedures or infected wound rinsing. Internet search of the literature did not result in any paper describing the use of this technique for thoracic surgery. We present our experience with an electrical wound-washing device in video-assisted thoracoscopic surgery for thoracic empyema or clotted hemothorax.


The goals of therapy for empyema and hemothorax are evacuation of the pleural space, control of infection, and restoration of pulmonary function by obviating restrictive lung disease. The evacuation of fibrin fragments and blood clots from the pleural cavity during video-assisted thoracoscopic procedures for empyema or clotted hemothorax poses a common problem [1]. Various techniques for pleural lavage and clot removal have been described. However, the most common method is repeat mechanical fragmentation by forceps alternating with large-bore lavage and suction. Despite this method’s prevalence, it is cumbersome, time-consuming, and frustrating. In this paper we describe our experience using an electric trigger-controlled device that combines irrigation and suction through a 10-mm port. This system has no side effects, reduces the average operation time, and yields favorable results, emphasizing its potential as an alternative to other methods.

Technique

Patients
From January 2009 to January 2013, 40 patients with empyema or clotted hemothorax were treated surgically by the authors. The video-assisted thoracoscopic surgery technique was used in 34 patients. An electric suction-lavage device (Pulsavac Plus Wound Debridement System; Zimmer, Inc, Warsaw, IN) was used for 32 procedures. The average operation time in this group of patients was 107 ± 15 minutes. Mean operation time in a similar group of patients operated on before we start using electric suction-lavage device was 123 ± 27 minutes ($p < 0.05$).

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Technique
The electric suction-lavage device was inserted through a 10-mm port (Fig 1A). Under thorascopic control, the saline sprinkler is directed into the clots. The volume of the water jet is controlled by the electric trigger. The water jet, combined with mechanical movements of the barrel, is used to break down fibrin or blood clots while the suction device simultaneously removes the debris (Fig 1B).

Comment
Video-assisted thoracoscopic surgery has become a popular method for the treatment of stage II empyema [1–3] and clotted hemothorax [4]. The process of clot fragmentation and debris removal may be frustrating and time-consuming. In this short paper, we present a simple and efficient method to break down the clots, irrigate, and drain the pleural cavity using an electric trigger–controlled suction-lavage device. This system was successfully used in 32 procedures. Seven patients were operated on for clotted hemothorax and 25 patients for stage II parapneumonic empyema. We found the device easy and convenient for use. There were no intraoperative complications. The average operation time was reduced by approximately 15% compared with a historic control group. This method is simple, reliable, and convenient.

References