Video Assisted Thoracoscopy in Treatment of Empyema In An Adult Population. A Prospective Study

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Abstract

Background: Few thoracic conditions present such a considerable challenge as does pleural empyema. The disease is known since Hip- pocrates' time, nonetheless it is still associated with the rising incidence all over the world. Minimally invasive procedures be- come more and more popular in many fields of surgery as well as in patients with pleural empyema. However, video-assisted thoracoscopy cannot replace open surgery in all empyema cases.

Objectives: to determine the outcomes of patients with early empyema stage I and II who underwent VATS washout with or without decortication on short and mid term basis.

Methods: October 2013 till March 2016, 60 patients who underwent VATS washout of early empyema stages I and II. This study was conducted in Ain shams university hospitals and affiliated hospitals.

Results: mean age 40.7 ± 1.8 years, 46 (76.7%) were males and 14(23.3%) were females The cause of empyema was post pneumonic in 31(51.7%) cases and post traumatic infected haemothorax in 29(49.3%) cases, 19 (31.7%) of cases were stage I exudative phase and 41(68.3%) were stage II fibrino-purulent empyema, there was no risk factors in 35 cases, 21 cases were diabetics, 1 case was chronic renal failure patient on regular dialysis and 3 cases were on cytotoxic drugs. Wash out only done in 20 cases (33.3%), Wash out and Decortication in 40(66.7%) cases. Only 17 patients needed ICU admition with mean duration of ICU Stay postoperative was 0.3 ± 0.06 (SEM) days. The mean duration of Hospital Stay was 4.2 ± 0.2 (SEM) days. There was no mortality and no patient suffered from any major morbidity. There was only 3 cases (5%) who needed another open decortications through thoracotomy at 8 and 12 weeks after the VATS procedure, the three patients had been referred late after four weeks from onset of symptoms but were given a trial of thoracoscopic drainage.

Conclusions: Thoracoscopic management of early stages of empyema should be the golden standard of management in surgically fit patients; particularly in the fibro-exudative phase of empyema. It is an effective and safe technique that reduces hospital stay and avoids the need for a decortication via a thoracotomy in most cases.

Key words: VATS empyema

﴿وقل ربِّ زِدْنِي عِلْماً﴾

سورة طـه الآيـــه رقم ١١٤

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Contents

List of Abbreviations

BC	:	Before Christ
CAP	:	Community-acquired pneumonia
Cap	:	Capillary
CBC	:	Complete blood count
CHF	:	Congestive heart failure
Cl-	:	Chloride
CRP	:	c-reactive protein
CXR	:	Chest x-ray
DM	:	Diabetes mellitus
ECG	:	Electrocardiogram
F	:	Fahrenheit
F	:	Rate of fluid movement
Fr	:	French
H+	:	Hydrogen
HCO3-	:	Bicarb
Hr	:	Hour
HTN	:	Hypertension
ICU	:	Intensive care unit
IL-8	:	Interleukin 8
K	:	The filtration coefficient
Kg	:	Kilogram
LDH	:	Lactate dehydrogenase
MCP-1	:	Monocyte chemotactic protein 1
ml	:	Milli liter
mm	:	Milli meter
Na+	:	Sodium
P and π	:	Hydrostatic and oncotic pressures respectively
Pl	:	Pleural space
S	:	Streptococcus

List of Abbreviations (Cont.)

TLC	:	Total leucocytic count
TNF-α	:	Tumor necrosis factor α
tPA	:	Tissue plasminogen activator
VATS	:	Video assisted thoracoscopic surgery
VEGF	:	Vascular endothelial growth factor
σ	:	The osmotic reflection coefficient for protein

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Introduction

Despite the impact antibiotics have had on empyema, it remains a common illness with significant morbidity and mortality ***(Bartlett JG.,1988).***

The emergence of antibiotic-resistant organisms, the increased frequency of anaerobic and nosocomial infections, and the steadily increasing number of patients with compromised immunity have combined to keep pleural infection a common clinical problem ***(Moran JF.,1988).***

Postpneumonic empyema is the most common form of empyema thoracis which accounts for 40–60% of cases ***(Chapman SJ and Davies RJ.,2004).***

Postpneumonic effusions occur in 20 to 40% of patients who are hospitalized with pneumonia ***(Light RW.,2001).***

The percentage of postpneumonic effusions which become thoracic empyema is variable and ranges from 5 to 20% ***(Ozol D et al.,2006).***

Empyema thoracis is still recognised as a major cause of morbidity and prolonged hospital stay ***(De Hoyos and SunderasenS.,2002).***

There are three stages to the development of postpneumonic empyema:

Stage I is an exudative phase characterised by a clear and thin pleural effusion.

Stage II is a transitional or fibrinopurulent phase where the fluid becomes thick, infected and purulent.

Stage III which is an organising or consolidative phase where granulation tissue is formed and encases the lung ***(Molnar TF,2007).***

As regard post traumatic infected hemothorax, tube thoracostomy is a common and vital tool in the immediate management of thoracic trauma; however, it is not without complications. Other than technical complications, empyema represents a major burden, which (assuming an approximately 5% incidence and requiring thoracoscopy drainage) ***(Maxwell RA, et al. 2004).*** However, some series have documented the incidence of empyema as high as 18% ***(Luchette FA, et al. 2000).***

Different surgical treatment modalities are used to manage primary empyema and in the present time video assisted thoracoscopic surgery (VATS) is considered as an effective procedure in the early stages of empyema thoracis ***(Luh SP et al.,2005).***

The use of VATS in stage I empyema in comparison to traditional chest drain insertion is a debatable topic.

However, in the late stages of empyema performing VATS becomes difficult and an open approach is often undertaken to decorticate the lung ***(RzymanW et al.,2004).***

Aim of the Work

The aim of this study is to determine the outcomes of patients with early empyema stage I and II who underwent VATS washout with or without decortication on short and mid term basis.

Review of literature

Anatomy of the pleura:

The visceral pleura envelopes the entire surface of both lungs except at the hilum, where the bronchi, pulmonary vessels and nerves enter the lung substance. The parietal pleura covers surface of the chest wall, mediastinum and diaphragm ***(Von Hayek, 1969)***.

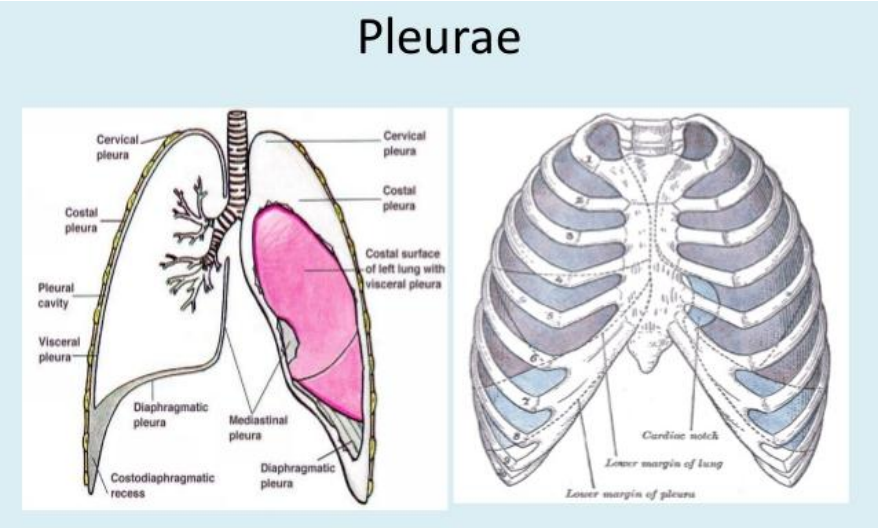

Fig. (1): Parts of the pleura ***(Drake et al,2010).***

Below the merger of visceral and parietal pleura at the hilum, pleural reflections from the dorsal and ventral surface of the lungs usually extend to the diaphragm as a double layer of mesothelial tissue, the pulmonary ligament ***(Wang, 1985)***.