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RESULTS OF DECORTICATION FOR EMPYEMA THORACIS - BETTER EARLIER THEN LATE

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ABSTRACT

Objective: To observe the results of early decortication in empyema thoracis.

STUDY DESIGN: An observational descriptive study

PLACE AND DURATION: Department of Cardiothoracic Surgery, Postgraduate Medical Institute, Lady Reading Hospital from June 2003 to June 2005.

MATERIALS AND METHODS: Clinical record of 200 patients who underwent decortication during 3 years were retrospectively analyzed. Detailed scrutiny of record was carried out to analyze the clinical presentation; various surgical procedures and outcome.

RESULTS: There were 120 (60%) male and 80 (40%) female patients. Majority of the patients 137 (68.5%) were in the age range of 20 – 40 years. Common presentation was fever (62%); cough (26%) and chest pain (11%). The duration of symptoms was less than 8 weeks in 57 % and more than 8 weeks in 43% cases. Common etiologies were pneumonia (31%), post tuberculous (37.7%), traumatic (24%) and iatrogenic (6.6%). Tube thoracostomy was the initial line of management in all patients. Decortication was done in all patients. The mortality was 0.5% (1/200). Fourteen (7%) had wound infection, air leak in 8 (4%), wound dehiscence in 4 (2%) and septicemia in 6 (3%) cases.

CONCLUSION: Chronic empyema, needs early rather then late decortication. Delay compraises results.

INTRODUCTION

Pleural empyema or empyema thoracis is an accumulation of pus in the pleural space. It has been recognized as a disease entity since the time of Hippocrates and has been associated with high mortality. During World War I, the overall empyema mortality rate among US military forces was 61%.[1] Before antibiotics were developed in the 1930s and 1940s, pleural empyema occurred in 10% of patients who survived pneumonia. Antibiotics effectively treated pneumonia and reduced the incidence of post pneumonic empyema. However, the incidence of postoperative empyema increased.[2]

Treatment of an empyema depends on its course, whether it is acute or chronic, the state of the underlying lung, the presence of a bronchopleural fistula, the ability to obliterate the space and the patient's clinical condition and nutritional status.[3] In the exudative stage of parapneumonic, post resection and post traumatic empyema chest tube drainage and antibiotics according to culture and sensitivity is a safe, efficacious primary method of empyema management.[4] Failures are due to improperly placed tube, loculation, increased fluid viscosity and early peel on the lung.[5] Failures are managed with rib resection, intrapleural thrombolytics, Video-assisted thoracoscopic drainage (VATS) and decortication. Video-assisted thoracoscopy (VATS) surgery presents less invasive approaches to the management of empyema by minimizing access trauma. Video-assisted thoracoscopic drainage (VATS) has been found to be particularly useful for treating the fibrinopurulent phase of empyema in which multiple loculations could be easily disrupted to allow adequate drainage.[6] Chronic empyema begins approximately 6 weeks after the onset of the acute illness. By then the wall of the empyema or the peel is organized by in growth of capillaries and fibroblasts and expansion of the lung by simple evacuation of the cavity can no longer be expected. Decortication or thoracoplasty can be used to obliterate the persistent space. In decortication thick visceral peel encasing the lung is removed to allow expansion and obliterate the space. A thick rigid parietal peel that restricts the mobility of thoracic cage should be excised.[7,8]

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MATERIAL AND METHODS

This is a retrospective analysis of patients

with thoracis empyema who needed decortication over three years period (June 2002 to June 2005). All patients between 10 to 50 years of age were included while those with associated intraabdominal sepsis were excluded from study. The hospital records and operation reports of these patients were carefully analyzed for demographic features, operative procedures and outcome; before surgery all patients we evaluated for fitness for general anesthesia by anesthetist. Double lumen endotracheal tube was used with one lung anesthesia during surgery. Routine monitoring of pulse, blood pressure, ECG, SPO_2 and $ETCO_2$ was done during surgery and postoperatively. Video-assisted thoracoscopic surgery (VATS) was not done due to non-availability of this facility at our department.

Decortication was done for stage III empyema, clotted hemothorax and multiloculated empyema. It was done through a standard posterolateral thoracotomy. Both parietal and visceral restricting peels were removed taking care to avoid lung damage and to reduce postoperative air leak. All loculations were broken down with finger and debris evacuated. Postoperatively patients were given effective analgesics. Patients were given regular physiotherapy and encouraged to cough. Continuous low pressure suction to chest drain was maintained for one week.

TABLE 1
PREOPERATIVE DATA OF PATIENTS (n = 200)

Variable	No.of Patients	% Age
Sex		
Male	120	60
Female	80	40
Age (year)		
10 – 20	31	15.5
21 – 30	71	35.5
31 – 40	67	33.5
41 – 50	31	15.5
Duration of Symptoms		
< 8 weeks	115	57.5
> 8 weeks	85	42.5
Symptoms		
Fever		
Cough		
Chest Pain		

RESULTS

A total of 200 patients admitted for treatment of empyema thoracic were studied. There were 120 (60%) males and 80(40%) females. Their age ranged from 10 -50 years. Majority of the patients i.e. 69% were in younger age group (age range 20-40 years). The mean duration of symptoms was less than 8 weeks in 114 (57%) and more than 8 weeks in 86 (43%) cases. The presenting symptoms were fever 62%, cough in 26% and chest pain in 11% at the time of initial examination (Table I).

An underlying cause for empyema was sought. Seventy five (37.5%) cases of empyema were posttuberculous; 64 (32%) postpneumonic, 48 (24%) postfirearm injury and 13 (6.5%) of iatrogenic etiology including postoperative empyema (Table III).

Mortality was 0.5% (1/200). Causes of death was empemic septicemia. Most common postoperative complication was wound infection 7%, followed by air leak 4%, wound dehiscence 2%, septicemia 3% and failed decortication 1%.

DISCUSSION

The American Thoracic Society classified empyema into three phases[1]. The exudative or acute phase characterized by fluid of low viscosity; the lung is expandable[2]. Fibrinopurulent or transitional phase characterized by more turbid fluid, the lung is progressively less expandable.[3] The chronic or organized phase is characterized by very viscous pleural fluid, organization of pleural peel which traps and fixes the lung. These three phases exist as a continuum and the transition from exudative to fibrinopurulent phase is not always clear out.[10,11] The basic principal of empyema thoracis management irrespective of stage is prompt drainage; appropriate antibiotics and reexpansion of the lung.[12] Of all empyemas currently diagnosed, 50% are secondary to complications of a primary pneumonic process in the lung. Other causes are spontaneous pneumothorax, tuberculosis, chest trauma, subphrenic abscess, foreign bodies retained in the bronchial tree, esophageal perforation and operations involving lungs and mediastinum.[6,13] Postpneumonic empyema was noted in 38% patients of our study. Tubercular etiology was found in 39%. Massard et al[14] reported an incidence of 29% in 1989, but this was significantly lower than what had been reported in various earlier stud-

ies[15,16] where tuberculosis was responsible for majority of patients with empyema thoracis.

There are few conditions in which management depends as much on the timing of treatment in the course of disease. Although it has been recognized for a longtime, the importance of timely intervention in empyema has not been emphasized enough[17]. The surgical approach to empyema has evolved over the years. During World War I, empyema treated by thoracotomy was associated with mortality. This prompted the establishment of the Empyema commission, which recommended chest tube drainage for treatment. Tube thoracostomy is usually the first step in the treatment of acute empyema. The success for tube thoracostomy is 70 – 85% but in our study initially 92 patients had adequate drainage with a success rate of 46%, more likely because most of our patients presented late with empyemas in organizing stage.

The Successful application of VATS to debride and drain loculated empyemas and clotted hemothoraces has been described; by Hutter and Associates (1985), Ridley and Braimbridge (1991). Empyemas that are demonstrated, either on CT scan or intraoperative evaluation to have a thick and fibrotic peel with lung entrapment should be decorticated by open technique[18]. VAT (Video Assisted Thoracoscopic) debridement was not used in any of our patients due to non-availability of this modality in our setting. VATS is not indicated for TB with thick peel. Most empyemas that we see, which have not responded to chest drain fall into this category. Decortication allows a more rapid recovery with a decreased number of chest tube days, and decreased length of hospital stay[19]. The success rate for decortication is 90-95%; in our series it also had an excellent result (99%). Just as in decortication of a chronically collapsed and trapped lung, lung damage requiring undesirable and unnecessary resection is often the result. The hospital mortality in our patients was 0.5%. Postoperative complications were few, sepsis, wound infection, empyema, hemorrhage, prolonged air leak, and bronchopleural fistula are the most common complications. These postoperative problems are minimized by meticulous surgical techniques that control air leaks and bleeding and ensure complete re-expansion of the lung with obliteration of the pleural space. Wound infection especially of old intubation site is the main problem postoperatively.

TABLE 2
ETIOLOGY

Variable	No.of Patients	% Age
- Post Pneumonic	62	31
- Post Tuberculous	75	37.5
- Traumatic	49	24.5
- Iatrogenic	14	07

CONCLUSION

We found early surgical intervention in empyema thoracis is a useful technique to avoid complication and decrease hospital stay. Thoracic empyema remains a common problem in third world countries. Early referred is advocated to prevent late complications of fibrothorax and reduced lung capacity. Timing of the surgical intervention is of paramount significance. First line of treatment is the chest drain and suction. Decortication being the second option should be considered early in any who have good surgical risk because it has high success rate low mortality and morbidity. Therapeutic delaying of decortication in order to gain 6 / 12 months ATT, preoperatively is not recommended. If other lung is healthy the sooner definite management (decortication, thoracoplasty) done the better. If other lung is also diseased then surgical intervention can be delayed till the completion of ATT.

TABLE 3
MORTALITY AND MORBIDITY

Mortality	No.of Patients	% Age
Decortication	1	0.5
Mortality	**No.of Patients**	**% Age**
Complication		
- Wound Infections	14	7
- Air Leak	08	4
- Wound Dehiscence	04	2
- Septicemia	06	3

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