Original Research Article

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Prospective study of thoracoscopy in empyema patients

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ABSTRACT

Background: Empyema thoracis is a serious problem from centuries, still causes significant morbidity and mortality if not diagnosed in early stages. The present study was conducted with the aim to evaluate the role of video assisted thoracoscopic surgery (VATS) in its management.

Methods: This prospective study was done on 15 patients in the department of General Surgery, Govt. Medical College and Sir Thakhatsinhji Hospital Bhavnagar, from August 2011 to August 2012. The demographic data, clinical presentation, etiology, and management were recorded and analyzed.

Results: None of the patients were observed with bronchopleural fistula. Majority of the patients were affected in the age group of 1-14 years (53%). Empyema was seen on left side of the lungs (73%). Etilogy of empyema was tuberculosis in 66% of the patients. Chest pain and breathlessness was seen in all in the patients (100%). No mortality was noticed in the study. The mean postoperative hospital stay was 5 days.

Conclusions: Present study shows that VATS is feasible, safe and it is an efficient procedure with decrease hospital stay and minimal complications in the management of empyema thoracis in all age groups.

Keywords: Empyema thoracoscopy, Thoracotomy, Video assisted thoracoscopy

INTRODUCTION

Empyema thoracis, by definition called as pus in thoracic cavity. Its incidence was increasing in both children and adults, but the cause is unknown.¹

It develops as a complication of bacterial or viral pneumonia particularly with virulent organism or in immnocompromised host, which occur in 5-10% of bacterial pneumonia. It may also occur in an untreated case of pulmonary tuberculosis. Although most of the cases of pneumonia are viral in origin, bacteria are causative agent in 20 to 30 % of cases.²

With the use of antibiotics, incidence of empyema thoracis has been decreased but pathogens have been altered. And there remain a condition with substantial mortality and morbidity. Most effective treatment is controversial. Most of cases are treated by physicians by repeated thoracocentesis and insertion of intrapleural under water seal drainage. Some require traditional approach of rib resection and open drainage, open window thoracostomy, decortications, thoracoplasty and thoracotomy.³

We felt that some guidelines according to the staging of the disease for the appropriate mode of management would improve the outcome and decrease the morbidity. Hence, we undertook the study for the evaluation of role of video assisted thoracoscopic surgery in the management of empyema thoracis.

METHODS

This prospective study was conducted in the department of General Surgery, Govt. Medical College & Sir Thakhatsinhji Hospital Bhavnagar, from August 2011 to

August 2012. The ethical clearance obtained from institutional review board meeting. 15 patients who fulfill the criteria are enrolled to the study after taking complete, written informed consent from patient self and patient relative.

Inclusion criteria

- Patient who came to the out-patient department with complain of pain in chest, fever, breathlessness, chest X-ray PA view suggested opacity on either side of lung and USG suggestive of fluid collection with multiple septa present.
- Patients who have ICD in situ with continuous pus discharge, and patient of chest trauma with hemodynamically stable were included in the study.

Exclusion criteria

Patients who were unable to tolerate single lung ventilation, having respiratory insufficiency with high airway pressure, patients with previous thoracotomy, controlateral pneumonectomy and chest trauma with hemodynamically unstable condition were excluded from the study.

All the 15 patients were selected for video assisted thoracic surgery and pre-operative fitness was done in all of them. Detailed history was collected as per proforma.

After completion of surgery, postoperative care was given for all the patients for first 24 hours by monitoring all the vital parameters and the patients were discharged after removal of ICD.

Postoperative follow up was done on 10th day to remove stitches and observed for any presence of chest pain, breathlessness, fever, local collection of fluid by USG and expansion of lung by digital chest X-ray (PA) view, and for any wound infection. Similar observations were also done on 2nd and 3rd week postoperatively for evaluating the outcome of the treatment.

Assessment of these patients comprised the demographic profile, the presenting clinical features, etiology of the empyema, the response to treatment and postoperative outcome.

The data was analyzed using the method of descriptive statistics and the results expressed as percentage of the total.

RESULTS

A total of 15 patients were included in the study under the age group of 1-60 years. None of the patients were observed with bronchopleural fistula. The frequency of empyema was higher in the patients of age group 1 to 14 year (53%). The commonest symptoms observed in all the patients (100%) are chest and breathlessness followed by cough (66%) and fever (60%). In majority of the patient's empyema was seen on left side of the lungs (73%). Tuberculosis was a prominent etiological factor in producing empyema thoracis in 66% of the patients. 80% of the patients were successfully treated by thoracoscopy and 20% of the patients required thoracotomy.

Of them 2 were pediatrics and 1 was young adult. Mean hospital stay was 5 days with standard deviation of 3.64. No mortality was noticed in the study.

Table 1: Clinical and surgical data of the patients.

		Number of notionts							
Variables		Number of patients (%)							
Age									
1-14		8 (53)							
15-30		4 (26)							
31-45		2 (13)							
45-60		1 (6)							
Clinical sympto	oms								
Chest pain	15 (100)								
Breathlessness		15 (100)							
Fever		09 (60)							
cough		10 (66)							
Thoracocentesis		0							
Empyema location									
Right		4 (26)							
Left		11 (73)							
Types of empye	, ,								
Tubercular		10 (66)							
Bacterial		4 (26)							
Viral		1 (6)							
Conversion to t	horacotomy								
Requirement of	thoracotomy	3 (20)							
during operation	l	3 (20)							
Successful thora		12 (80)							
Postoperative h	ospital durati	on stays							
Thoracoscopy	1-5 days	9 (60)							
	6-10 days	3 (20)							
	More than	_							
	11 days								
Thoracotomy	1-5 days	-							
	6-10 days	-							
	More than	3 (20)							
	11 days								
Mortality rate		0							

Table 2 presents the postoperative management in all the 15 patients. 7 patients were extubated on first postoperative day and 8 patients on 2nd day.

Liquid orally was given for 4 patients on 1st day and for 11 patients on 2nd day postoperatively. 50% of the patients were mobilized on 3rd day and other 50% on 4th day. ICD was removed on 2nd day in 6 patients and on 3rd day postoperatively in 9 patients.

2 patients were discharged on 3rd day, 5 patients on 4th day, 3 patients on 5th day, 2 patients on 2nd day

postoperatively and 3 patients were discharged after 12 days postoperatively.

Table 2: Postoperative management.

Stages	Postoperative days											
	1	2	3	4	5	6	7	8	9	10	11	>12
Patient is extubated	7	8										
Liquid orally	4	11										
Mobilation			6	6						2	1	
Removal of ICD		6	9									
Discharge			2	5	3	2						3

DISCUSSION

The exact management of empyema still remains controversial.⁴ The success rate of empyema treatment with antibiotics and thoracocentesis was only 6-20% even if the disease was detected in its early stages. Thoracoscopy was found to be the effective treatment for empyema predominantly if the lung does not expand under drainage.⁵ The main advantage of VATS over standard thoracotomy was, it ensures equal results to standard technique, it also allows a precise view of the entire pleural cavity and a debridement can be done under direct vision and also it is less invasive surgical technique.⁵ Our present study emphasizes the efficacy of video assisted thoracoscopy (VATS) in the management of pleural empyema when standard procedure represent the only therapeutic alternative in the present study cases.

In our series the highest incidence of empyema was seen in the patients of 1-14 years (53%). On contrary to this finding, studies of Acharya et al found the highest incidence of empyema at the age between 21-40 years (42%).⁶ Two other studies were also showed the highest incidence of empyema after the age of 40.^{7.8} This might be due to the common incidence of pulmonary tuberculosis in this age group, predominantly in the developing countries

The clinical characteristics of empyema vary widely and depend on both the nature of infecting organism and the immuno competence of the patients. They may range from absolutely no symptoms to severe illness with systemic toxicity. Sub-acute illness will be noticed in anerobic and tubercular infections and acute illness was seen in aerobic bacterial infection. In our study, the common symptom observed in all cases (100%) was chest pain and breathlessness followed by cough (66%) and fever (60%). In a study by Kamath, the common symptom in the patient observed was cough in majority of the patients (94%) followed by fever (76%), chest pain (75%) and dyspnea (53%). In our study, empyema was tubercular in etiology in 10 cases, developed due to bacterial infection in 4 cases and due to viral in 1 case.

Similar incidence of etiology was also observed in the studies of Acharya et al.⁶

In the present series, left sided pleural pathology (73%) was comparatively higher than right sided (26%). This was converse with the findings of Lamas-Pinheiro et al. In his study, empyema was majorly noticed on right side of the lung (54%) compared to left side (42%) and in 4% cases empyema was seen in both sides of the lungs. ¹⁰

Conversion rates from thoracoscopy to thoracotomy are quite different among studies, ranging from 5.6% to 61%. In present study, thoracoscopy was succeeded in 80% of the cases and the conversion rate to thoracotomy was only 20%. This was similar to the findings of Lamas-Pinheiro et al (18%) and Landreneau et al (17%). Io,12

Postoperative hospital duration stays in patients who underwent thoracoscopy was between 1-10 days (mean- 5 days) whereas in case of thoracotomy it was more than 11 days. In a study by Hornick et al the average number of postoperative hospital stays for patients who underwent thoracoscopy was 7.8 days, and in a study by Striffeler et al it was 12.3 days. ^{13,14}.

CONCLUSION

The findings of the study conclude that thoracoscopic approach for empyema is feasible and safe for its management with lesser complications, no mortality and with lesser postoperative hospital stay. This procedure avoids a significant number of thoracotomies.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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