VOLUME - 10, ISSUE - 02, FEBRUARY - 2021 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

General Surgery

A STUDY OF VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) IN THE MANAGEMENT OF EMPYEMA THORACIS

Dr. Sujat Lele* M.S. General Surgery Resident; Smt. Kashibai Navale Medical College, Narhe, Pune, Maharashtra. *Corresponding Author

Dr. Ajay Naik Mch. Pediatric Surgeon, Professor And Head Of Department, Dept. Of Surgery, Smt. Kashibai Navale Medical College, Narhe, Pune, Maharashtra.

ABSTRACT Empyema thoracis defined as pus in the pleural cavity is often associated with poor lung compliance and function, prolonged recovery time. Video assisted Thoracoscopic Surgery in the mangement of Empyema Thoracis has now begun to be widely used as a first line treatment bypassing a trial with percutaneous drainage or with an intercostal drainage tube. Patients treated with VATS also had a comparatively lesser hospital stay. Patients treated with VATS had potentially lesser surgical site infections and improved tolerance for exercise, lesser paraesthesia and required lesser analgesia. Also VATS worked best in stages 1 and 2 of empyema with a significantly decreased conversion rate to open surgery, reduced operative time, lesser blood loss, fewer days of intercostal drainage, fewer days of post operative air leak, lesser rate of surgical site infection and lesser hospital stay than stages 3 and 4. Thus it is safe and effective to use Video assisted Thoracoscopic Surgery in Empyema Thoracis as a definitive first line treatment method.

KEYWORDS :

INTRODUCTION

Empyema thoracis defined as pus in the pleural cavity is often associated with poor lung compliance and function, prolonged recovery time and a mortality rate of 20%.

Classically the management of empyema thoracis would include evacuation of the pus and antibiotic cover. This evacuation of pus within the pleural space has been tried with percutaneous drainage, by the use of inserting an intercostal drain into the pleural cavity, by means of thoracoscopic drainage or by an open thoracotomy.

Primary decortication by means of Video Assisted Thoracoscopic Surgery (VATS) as against medical management in empyema would not only drastically improve the time scale of recovery of the patient but also cut down to some extent the financial burden brought on by prolonged medical care.

The study aimed to understand the role of pleural decortication by Video Assisted Thoracoscopic Surgery and asses the benefits brought about by its application to the management of empyema thoracis.

AIMS AND OBJECTIVES

1. To understand and evaluate the role of VATS in management of empyema thoracis.
2. To study the efficacy and complications of VATS as a therapeutic tool in Empyema Thoracis.

MATERIAL AND METHODS

Study type - Prospective

Source of data - 30 patients diagnosed to have empyema thoracis admitted to the tertiary care centre during the period of November 2018 to November 2020 were included in this study, after the necessary and due clearance from the institutional medical ethics committee.

Inclusion criteria:

1. Patients diagnosed to have empyema thoracis.
2. Patients with loculated pleural effusion.
3. Patients with unresponsive empyema.
4. Patients treated with intercostal drains without benefit.
5. Patients where the pleural effusion remained undiagnosed.

Exclusion criteria:

1. Patients deemed unfit for surgery due to co morbid conditions such as recent myocardial infarction, coagulopathies, poor pulmonary reserve.
2. Moribund patients with poor lung function or those on ventilatory support.

Methodology of the study:

The study was carried out in the Department of General Surgery, of the institute between the period of November 2018 to November 2020.

Patients of pneumonitis were monitored for development of empyema or those presenting with empyema on admission were considered.

Each patient was asked their clinical history and was made to undergo a detailed clinical examination to look for signs of tracheal shift, decreased chest movements on the side of empyema, intercostal tenderness, decreased vocal fremitus on the side of empyema, dull note on percussion , absent air entry or decreased air sounds on the side of empyema, presence of any adventitious sounds.

Tests included:

Complete blood count
Chest X-ray
Ultrasonography of thorax
High resolution computerised tomography of thorax

Anticipated risk factors:

1. The study included patients who had met criteria for undergoing surgery, so they would face the same potential risk factors as any person undergoing surgery namely, primary Hemorrhage, secondary Hemorrhage, wound infection and visceral injury.
2. Potential risk factors in thoracic surgery namely air leak, broncho - pleural fistula

Analysis of results:

The data was entered and results were analysed using SPSS version 19.0. Fischer's exact test, t test, ANOVA tests were used where necessary.

Data was assessed on basis of:

1. Cases requiring conversion to open thoracotomy.
2. Number of days of hospital stay.
3. Number of days of intercostal drainage.

4. Surgical site infection if any.
5. Post operative complications in the form of air leak, subcutaneous emphysema, pneumonia, pneumothorax, haemothorax, ventilator support, re exploration for bleeding.
6. Post operative 4 week follow up to assess: perceived improvement in exercise tolerance compared with immediately before, any residual pain or paraesthesia, average duration of analgesic use, resolution of any associated consolidation and cosmetics.

Post operatively patients were kept on intravenous antibiotics for 5-7 days and then shifted to oral antibiotics on discharge. Intercostal drains were removed once lung expansion was complete confirmed on chest X-ray and once drain output ceased.

OBSERVATION AND RESULTS

Age distribution

AGE GROUP	NO. OF CASES	PERCENTAGE OF CASES
<10	19	63.33%
11-20	4	13.33%
21-30	4	13.33%
31-40	2	6.66%
41-50	1	3.3%
Total	30	100%

Sex distribution

SEX	SEX DISTRIBUTION	PERCENTAGE OF CASES
MALE	20	67%
FEMALE	10	33%
TOTAL	30	100%

Presenting Symptoms

SYMPTOMS	OBSERVED	ABSENT	TOTAL
COUGH	100%	0%	100%
EXPECTORATION	80%	20%	100%
CHEST PAIN	60%	40%	100%
BREATHLESSNESS	40%	60%	100%
FEVER	80%	20%	100%

Conversion to thoracotomy

SURGICAL PROCEDURE	NO. OF PATIENTS
TREATED BY PRIMARY VATS	24
CONVERSION TO THORACOTOMY	6
TOTAL	30

Distribution of patients according to stages of empyema

STAGE OF EMPYEMA	NO. OF PATIENTS
STAGE 1	10
STAGE 2	14
STAGE 3	4
STAGE 4	2
TOTAL	30

Surgical procedures at various stages of empyema

	STAGE 1	STAGE 2	STAGE 3	STAGE 4
VATS	10	13	1	0
THORACOTOMY	0	1	3	2
TOTAL	10	14	4	2

Average blood loss as per surgical procedure

	NUMBER OF PATIENTS	BLOOD LOSS MEAN	BLOOD LOSS SD	P VALUE
VATS	24	87.08	43.39	< 0.001
THORACOTOMY	6	346.67	300.11	

Average operation time as per surgical procedure

	No. Of Patients	Operative Time (Mean)	Operative Time (SD)	P Value
VATS	24	76.96	17.484	0.004
THORACOTOMY	6	99.33	12.028	

Surgical Site Infections as per procedure

Surgical Procedure	VATS	Thoracotomy	Total
No SSI	24	4	28
SSI	0	2	2
Total	24	6	30

Post operative Pneumonia

Post Operative pneumonia	VATS	Thoracotomy	Total
No	20	1	21
Yes	4	5	9
Total	24	6	30

Postoperative Pneumothorax/ Haemothorax

Postoperative Pneumo/Haemothorax	VATS	Thoracotomy	Total
No	24	5	29
Yes	0	1	1
Total	24	6	30

DISCUSSION:

With the detection and confirmation of empyema thoracis in a patient, the surgical methods available to tackle it range widely from simple aspiration to open thoracotomy and decortication. The technique to be used as a first line method is often a matter of debate as patients will present at various stages of the disease and with varied extent of symptoms.

1. In our study , it can be seen that the cases of empyema thoracis mainly were those of the pediatric age group .
2. In our study , 67% cases were males and 33% females.
3. In our study, 30 patients presented with cough, 24 with additional expectoration , 18 with chest pain , 12 with breathlessness and 24 with fever.
4. The study comprised of 60% patients with right sided empyema and 40% with left sided empyema.
5. In the study, 80% patients were successfully treated by primary VATS whereas in 20% patients, decortication by VATS could not be completely carried out hence required conversion to open surgery.
6. Majority of patients presented with stage 2 empyema and were ideal candidates for primary VATS.
7. From the study it was inferred that an increase in the stages of empyema surgical time and blood loss also increases.
8. There is a significant association with increasing stages of empyema and surgical site infection.
9. The study also suggests a significant association between post operative pneumonia and conversion to thoracotomy nut no association between post operative pneumothorax or haemothorax and the type of surgical procedure employed.

SUMMARY AND CONCLUSION

Video assisted Thoracoscopic Surgery in the mangement of Empyema Thoracis has now begun to be widely used as a first line treatment bypassing a trial with percutaneous drainage or with an intercostal drainage tube.

It has also shown to b a simpler, safer and faster alternative in achieving a successful outcome compared to the procedure of thoracotomy and decortication provided the patients were treated in early stages of empyema before extensive organization and pleural thickening settled in that warranted a conversion to open surgery.

VATS when done in early stages had a success rate of 95%.

Ii was the more advanced cases that needed a conversion to thoracotomy after an initial trial with VATS .

VATS proved to be beneficial especially in early empyema with lesser blood loss, operative time, days of post surgical

intercostal drainage and postoperative air leak than open thoracotomy.

Patients treated with VATS also had a comparatively lesser hospital stay.

Patients treated with VATS had potentially lesser surgical site infections and improved tolerance for exercise, lesser paraesthesia and required lesser analgesia.

Also VATS worked best in stages 1 and 2 of empyema with a significantly decreased conversion rate to open surgery, reduced operative time, lesser blood loss, fewer days of intercostal drainage, fewer days of post operative air leak, lesser rate of surgical site infection and lesser hospital stay than stages 3 and 4.

Thus it is safe and effective to use Video assisted Thoracoscopic Surgery in Empyema Thoracis as a definitive first line treatment method.

REFERENCES

1. Light RW. Parapneumonic effusions and empyema. Proc Am Thorac Soc. 2006;3(1): 75-80
2. Medeiros IL., Terra RM, Choi EM, Pego-Fernandes PM, Jatene FB. Evaluation of serial C reactive protein measurements after surgical treatment of pleural empyema. Clinics (Sao Paolo). 2012;67(3): 243-7
3. Landreneau RJ, Keenan RJ, Hazelrigg SR, Mack MJ, Naunheim KS. Thoracoscopy for empyema and hemothorax. 1996; 109(1): 18-24
4. Lawrence DR, Ohri SK, Moxon RE, Townsend ER, Fountain SW. Thoracoscopic debridement of empyema thoracis. Ann Thorac Surg. 1997;64(5): 1448-50
5. Dunham EK, Graham EA, Mitchell JF et al., Empyema commission. Cases of empyema at Camp Lee, VA. Preliminary report. AM J Med Assoc 1918; 71: 366-373
6. Davies CW, Kearney SE, Gleeson FV, et al. Predictors of outcome and long term survival in patients with pleural infection. Am J Respir Crit Care Med 1999; 160: 1682-1687.
7. Ferguson AD, Prescott RJ, Selkon JB, et al. The clinical course and management of thoracic empyema. QJM 1996; 89: 285-289.
8. Maskell NA, Davies CW, Nunn AJ, et al. UK controlled trial of intrapleural streptokinase for pleural infection. N Engl J Med 2005; 352: 865-874
9. Desai G, Amadi W. Three years experience of empyema thoracis in asoociation with HIV infection. Trop Doct 2001; 31: 106-107
10. Light RW, Rodriguez RM. Managemnet of parapneumonic effusions. Clin. Chest Med 1998; 19: 373-382.
11. Colice GL, Curtis A, Deslauriers J, et al. Medical and surgical treatment of parapneumonic effusions: and evidence based guidline. Chest 2000; 118: 1158-1171
12. Roxburgh CS, Youngson GG, Townend JA, et al. Trends in pneumonia and empyema in Scottish children in the past 25 years. Arch Dis Child 2008; 93: 316-318.
13. Hendrikson DJ, Blumberg DA, Joad JP, et al. Five fold increase in pediatric parapneumonic empyema since introduction of pneumococcal conjugate vaccine. Pediatr Infect Dis J 2008; 27: 1030-1032
14. Munoz – Almagro C, Jordan I, Gene A, et al. Emergence of invasive pneumococcal disease caused by non vaccine serotypes in the era of 7-valent conjugate vaccine. Clin Infect Dis 2008; 46: 174-182
15. Van Ackere T, Proesmans M, Vermeulen F, et al. Complicated parapneumonic effusion in Belgian children: increased occurrence before routine pneumococcal vaccine implementation. Eur J Pediatr 2009; 168: 51-58.