ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 03 | March - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

UTILITY OF VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) IN RESPIRATORY DISEASES

General Surgery

Dr. Manik Charandas Gedam

Dr. Suresh Kumar Gorle*

*Corresponding Author

ABSTRACT

Background: VATS has diverse application from diagnostic usage to therapeutic measures. Hence the present study was undertaken to study the utility of VATS in respiratory diseases in our tertiary care centre.

Methods: A total of 30 patients underwent VATS. Demographic data and peri operative details were noted. Surgical outcome, conversion rate, length of hospital stay and complications were noted.

Results: Majority of study subject's age range was from (20 -40) years. (63.3%). The male: female ratio was 1.5:1. Commonest indication was Empyema(TB/Parapneumonic) (53.33%) followed by Post thoracis trauma (6.6%) , Cystic Disease /Bulle/Pneumothorax (6.6%), Fungal Aspergilloma (6.6%), Pleural Biopsy (6.6%) , Pulmonary Hydatid Disease (6.6%), Lung Abscess (6.6%) , Ca Oesophagus for VATS Esophagectomy (3.3%) and Suspicious malignant Pleural Effusion (3.3%).Therapeutic indication was (76.6%), diagnostic indications were (6.6%) and both were (16.6%). Diagnostic accuracy was (93.3 %). Conversion rate was (20 %). Complications were seen in (30%). Average hospital was found to be 12.59 +/- 5. 41 days (7-34 day) and chest tube drainage was 8.7 days +/- 3.0 days.

Conclusions: VATS enables diagnostic accuracy for better therapeutic management. Our experience suggests that VATS is an alternative means of treatment and an excellent initial approach to various respiratory diseases.

KEYWORDS

VATS , Utility of VATS , VATS in respiratory diseases, VATS in Trauma Chest , VATS in empyema ,Diagnostic VATS

INTRODUCTION

The appearance of the term "thoracoscopie " dates back to as early as 1800s(Hoksch et al., 2002). Earliest documented use of a modified cystoscope to observe the thoracic cavity is attributed to Swedish physician Jacobaeus(Ng & Yim, 2008). Thoracoscopy in those days is considered to be performed with whatever faint light available. Though diagnostic and therapeutic thoracoscopies were done in 1980s, they were only used in sporadic ways and never gained wide acceptance. Recent developments in optic cables, video monitor systems and instruments led to increased frequency of thoracoscopy. (Wakabayashi, 1991)

During early years, Video – assisted thoracic surgery (VATS) was primarily used for basic procedures. In the recent years application of thoracoscopy has expanded. They are diverse, starting from its diagnostic ability to its therapeutic applications.(VATS) gained a popular interest in Lung biopsies, pneumothorax, pleural biopsies , debridement and decortication , etc. VATS became a standard procedure for many thoracic operations or as a alternative or a complementary procedure for difficult thoracis procedures(Luh & Liu, 2006). VATS debridement and decortication recently gained wider application in management of empyema. It's been established that VATS is a safe and effective alternative procedure with less morbidity.(Chan et al., 2007) .VATS is considered a better alternative to thoracotomy in assessment of subjective criteria of physical functions, pain , breathing difficulty, although results may vary depending on day or time of post op assessment.(Ng & Yim, 2008)

More often, patients with empyema thoracis are the ones referred to surgery department from respiratory department for surgical intervention in our tertiary care hospital. With this background present study is conducted to study the utility of VATS in few commonly encountered respiratory diseases in our tertiary care set up.

METHODS

This prospective observational study was conducted in 30 patients with various respiratory diseases meeting the inclusion criteria. : Patients with age more than 18 years with empyema thoracis i.e. computed tomography (CT) of chest showing empyema. I.e. loculated effusion surrounded by a homogenously thickened and contrast enhancing pleura, patients with inadequate drainage of empyema despite chest tube drainage, diagnosed c/o Tubercular empyema : fulfilling any or all of the following criteria were 1. Pleural fluid staining positive for AFB 2. And /or MTB detected on CBNAAT analysis of Pleural fluid 3. And /or old diagnosed case of PTB, post trauma patients with retained hemothorax/empyema and/or persistent air leak , patients with CT suggestive of bulla ; occupying 1/3 or more of hemi thorax and/or presence of symptoms or complications known to be attributable to them, like pneumothorax or recurrent respiratory infection, patients needing pleural, lung parenchymal or mediastinal biopsies for benign disease(s), benign, malignant or metastatic tumour(s), deemed resectable pleural, lung , mediastinal, esophageal malignant tumour by radiographic imaging studies for VATS excision, lung Hydatidosis cases confirmed by radiographic imaging studies, cases of symptomatic pulmonary aspergilloma despite medical management, patients with other respiratory disease(s) needing wedge resection, or segmentectomy.

Exclusion criteria include patient with age less than 18 years , sputum positive tuberculosis, inability to tolerate single lung ventilation, patients with deemed unresectable tumour(s) by radiographic imaging studies, Immunocompromised patients ; (a) malignancy with ongoing or completed radiation or chemotherapy (b) organ transplantation with immunosuppressive therapy (c) collagen vascular disease or auto immune disease patient needing corticosteroids and/or immunosuppressive therapy (d) AIDS patient.(e) Chronic renal failure patients, Respiratory distress patients (a) Respiratory rate of more than 30 breaths/minute and PaO2 less than 60mm Hg on room air and needing supplemental oxygen or ventilator support, patients unfit for general anaesthesia or bilateral involvement of lungs.

Detailed history was taken and clinical examination was done for all patients on admission. Detailed investigations and radiological features were noted. Pre operative interventions (if any) were noted. Pre-anaesthesia checkups & cardio respiratory fitness for surgery was done. A written informed consent of all the patients & relatives were obtained All patients underwent VATS procedures under general aesthesia using double lumen tracheal intubation, in lateral decubitus position with the side to be explored positioned up. A 0/30/60 degree video telescopic camera was inserted mid axillary line port in the lower chest (7 to 8 inter costal space).The other 2 ports were inserted under visualisation in anterior and posterior axillary lines in the (4th to 6th intercostal spaces as per need).All cases generally need 2 working ports in addition to the camera port. Some cases occasionally may need 1 or 2 additional 5 mm ports.

For anterior mediastinum approach, patient arm extended over their head, and port positioned more anteriorly and apically for good visualization. The site and number of ports were determined as per the need of procedure performed. Sharp and blunt dissection techniques varied on case to case basis as per the need of the procedure intended to perform. For specimen delivery, working port incisions were

extended.1 or 2 chest tubes are placed through existing port sites as per need, secured and connected to underwater seal bags. Remaining port site closure was done using Ethilon 2-0. Sterile dressing done. Reason for conversion to thoracotomy (if any) was noted.

Demographic and peri operative data was collected, analyzed and catalogued.

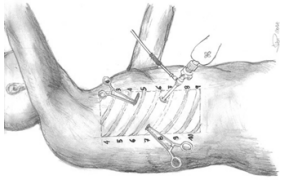


Figure 1 Port position

Figure 2 Chest X Ray of right sided hydatid cyst of the lung

STATISTICALANALYSIS:

No statistical methods were used as this was a prospective observation study, and individuals undergoing VATS were not comparable as indications for different surgical procedures were different. All data is presented in tabular form in numbers and percentage.

RESULTS:

Majority of study subject's age range was from 20 to 40 years. (63.3%). The male: female ratio was 1.5:1. Commonest indications for VATS were Empyema(TB/Parapneumonic) (53.33%) followed by Post thoracis trauma (6.6%) , Cystic Disease /Bulle/Pneumothorax (6.6%), Fungal Aspergilloma (6.6%), Pleural Biopsy (6.6%) , Pulmonary Hydatid Disease (6.6%), Lung Abscess (6.6%) , Ca Oesophagus for VATS Esophagectomy (3.3%) and Suspicious malignant Pleural Effusion (3.3%).• Therapeutic indication was (76.6%), diagnostic indications were (6.6%) and both were (16.6%). •Diagnostic accuracy was (93.3 %). Conversion rate was (20 %). Complication rate was (20%) . Average hospital stay was found to be 12.59 +/- 5. 41 days (7-34 day). Average chest tube drainage was found to be 8.7 days +/- 3.0 days. Average patient's satisfaction with wounds on a self reporting scale of 10 points was 7.5+/- 0.70 and satisfaction with surgery score was 7.45 +/- 0.70.

Table 1 Demographic profile of the patients.

Parameters		No of cases	Percentage
Age in years	20-30	10	33.33%
	31-40	9	30%
	41-50	4	13.33%
	51-60	5	16.66%
	61-70	1	3.3%
	71-80	1	3.3%
Gender	Male	18	60%
	Female	12	40%

Table 2 Surgical outcome in study subjects

Outcome	Mean	SD
Intercostal Drainage (Days)	8.7	3.0
Hospital stay (Days)	12.59	5.41

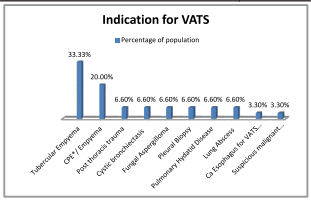
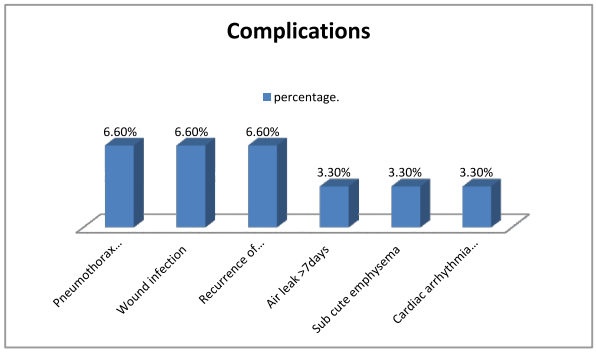


Figure 3 Distribution of Study subjects according to Indication

Table 3 Distribution of study subjects according to complications encountered.



DISCUSSION:

The application of thoracoscopy has a wide range from diagnosis to treatment. VATS is considered as better option than thoracotomy. (Luh & Liu, 2006),

In our case series, majority (63.3%) of study subjects are in age range (20- 40) years. Rene Jancovici et al reported age range of 16 to 88 years. (Jancovici et al., 1996) From our experience and comparing previous studies, we can opinion that VATS can be used in various age groups. Probably sex of the patient has nothing to do with utility of VATS.

(21%) study subjects underwent VATS for empyema (TB/ Parapneumonic) in present study. Samir Johna et al , reported VATS use for empyema in (21%)(Johna et al., 1997)

Anthony P. C. Yim et al. reported (6.5%) for empyema(Ng & Yim, 2008). Whereas Rene Jancovici et al reported pneumothorax as major indiaction (42.5%) of study population(Jancovici et al., 1996). As all patients were referred from chest and TB medicine department, tubercular infection being rampant in India, they were major contributors in our study.

Yim et al reported (38.5%) diagnostic use and (61.5%) therapeutic use. Wakabayashi et al. reported similar (36%) diagnostic use and (64%) therapeutic use.(Yim & Liu, 1996)(Wakabayashi, 1991). Similar therapeutic indication (76.6%), diagnostic indications (6.6%) and both (16.6%) were found in our study. With gaining experience and confidence, therapeutic applicability of VATS is seen increasing.

24 out of 30 patients were managed successfully with VATS. 6 patients needed conversion to open due to bleeding, dense adhesions or difficulty in access resulting in conversion rate of (20%). Rene Jancovici et al. reported (12.4%) conversion rate, Samir Johna et al.in reported (7%). As low as (4%) conversion was reported by Adel K. Ayed Emad et al.(Jancovici et al., 1996)(Johna et al., 1997) .

Accurate diagnosis is key to patient care. VATS helped in establishment of diagnosis in almost (93.3%) study population. Pre VATS only 76.6% cases had established diagnosis. Similar diagnostic accuracy of (95%) was seen in a study conducted by Samir Johna et al.(Johna et al., 1997) Wakabayashi et al. reported a diagnostic accuracy of nearly (99%)(Wakabayashi, 1991). Diagnostic accuracy helps in proper therapeutic management and patient care.

Chan et al. reported (22%) complication rate in their study(Chan et al., 2007). Johna et al reported (28.9%) and Peter N. Wurnig et al. Reported (11.53%).(Johna et al., 1997)(Wurnig et al., 2006) We found (30%) cases developed one or other complications. To a greater extent complications were seen in chronic disease patients, probably chronic inflammation leading to distorted anatomy and adhesions.

Homvises et al. reported average ICD of 5 days and median hospital stay of 12.6 days. Chen B et al reported 7.2 +/-3.4days hospital stay with 5.4+/-2.6 days of ICD. Similar results were seen in present study, average hospital stay found to be 12.59+/- 5.41days (7-34 days). Average ICD was 9.3 days +/- 3.0 days.(Thori et al., 2020)

Compared to studies by Kumar belal et al similar patient satisfaction scores with post operative wounds and surgery were noted in our study.(Kumar et al., 2017)

CONCLUSION:

Though thoracoscopy usage dates back to more than hundred years. VATS has evolved as a diagnostic and therapeutic means for various respiratory diseases. Last two decades have witnessed increased application of VATS due to refinement in instruments and surgical techniques. VATS enables diagnostic accuracy for better therapeutic management of respiratory diseases. With increasing skill and experience VATS can be an effective means for many thoracic surgical procedures with less pain, shorter hospital stay, low morbidity and very good outcomes as compared to conventional procedures. Our experience suggests that VATS is an alternative means of treatment and an excellent initial approach to various respiratory diseases. However, significant limitations of VATS should be kept in mind like long learning curve and limited patient selection criteria.

REFERENCES

1. Chan, D. T. L., Sihoe, A. D. L., Chan, S., Tsang, D. S. F., Fang, B., Lee, T. W., & Cheng, L. C. (2007). Surgical Treatment for Empyema Thoracis: Is Video-Assisted Thoracic Surgery "Better" Than Thoracotomy? *Annals of Thoracic Surgery*, *84*(1), 225–231. https://doi.org/10.1016/j.athoracsur.2007.03.019
2. Hoksch, B., Birken-Bertsch, H., & Müller, J. M. (2002). Thoracoscopy before Jacobaeus. *Annals of Thoracic Surgery*, *74*(4), 1288–1290. https://doi.org/ 10.1016/ S0003-4975(02)03676-7
3. Jancovici, R., Lang-Lazdunski, L., Pons, F., Cador, L., Dujon, A., Dahan, M., & Azorin, J. (1996). Complications of video-assisted thoracic surgery: A five-year experience. *Annals of Thoracic Surgery*, *61*(2), 533–537. https://doi.org/10.1016/0003-4975(95)01060-2
4. Johna, S., Alkoraishi, A., Taylor, E., Derrick, M., & Bloch, J. H. (1997). *Video-Assisted Thoracic Surgery : Applications and Outcome. 805*, 41–44.
5. Kumar, A., Asaf, B. B., Lingaraju, V. C., Yendamuri, S., Pulle, M. V., & Sood, J. (2017). Thoracoscopic Decortication of Stage III Tuberculous Empyema Is Effective and Safe in Selected Cases. *Annals of Thoracic Surgery*, *104*(5), 1688–1694. https://doi.org/10.1016/j.athoracsur.2017.06.038
6. Luh, S. ping, & Liu, H. ping. (2006). Video-assisted thoracic surgery--the past, present status and the future. *Journal of Zhejiang University. Science. B.*, *7*(2), 118–128. https://doi.org/10.1631/jzus.2006.B0118
7. Ng, C. S. H., & Yim, A. P. C. (2008). Video-assisted thoracic surgery for thymectomy. *Endoscopic Surgery in Infants and Children*, *137*(9), 179–187. https:// doi.org/ 10.1007/ 978-3-540-49910-7_25
8. Thori, R., Desai, G. S., Pande, P., Narkhede, R., Vardhan, A., & Mehta, H. (2020). "Video Assisted Thoracoscopic Surgery (VATS) for all Stages of Empyema Thoracis: a Single Centre Experience." *Indian Journal of Surgery*, *82*(4), 520–526. https://doi.org/10.1007/s12262-019-02042-8
9. Wakabayashi, A. (1991). Expanded applications of diagnostic and therapeutic thoracoscopy. *Journal of Thoracic and Cardiovascular Surgery*, *102*(5), 721–723. https://doi.org/10.1016/s0022-5223(19)36864-3
10. Wurnig, P. N., Wittmer, V., Pridun, N. S., & Hollaus, P. H. (2006). Video-assisted thoracic surgery for pleural empyema. *Annals of Thoracic Surgery*, *81*(1), 309–313. https://doi.org/10.1016/j.athoracsur.2005.06.065
11. Yim, A. P. C., & Liu, H. P. (1996). Complications and failures of video-assisted thoracic surgery: Experience from two centers in Asia. *Annals of Thoracic Surgery*, *61*(2), 538–541. https://doi.org/10.1016/0003-4975(95)01097-1