

A Modified Approach for Video Assisted Thoracoscopy In Paediatric Patients

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Abstract

Background: Thoracoscopy requires selective bronchial intubation and a sophisticated technical setup. This study was designed to assess the difficulty and feasibility of thoracoscopy using modified intubation maneuver and modified position for the surgery.

Methods: 138 children below 12 years underwent right thoracoscopy from June 2014–November 2017. Data were collected from CCM Medical College and Pt. JNM Medical College. All procedures were done using modified technique of selective left endobronchial intubation. Modified position used was 45° tilt. The infrastructure used included 5mm telescope, single chip camera, halogen light source, suction apparatus and 14 inch television. CO₂ insufflation was not used and ports were kept open.

Results: Right thoracoscopy was performed. Follow-up ranged from 1–17 months. Age range was 18–144 months. All cases were asymptomatic at last follow up. Mean operating time was 1.30 hours (Range: 1.00–2.30 hours). There were 126 empyema, 9 hydatid cysts and 3 esophageal duplication cyst. There were 48 tubercular empyema and 78 post pneumonia empyema. Intercostal drain was kept for a mean period of 3 days (Range: 2–4 days). All the cases were kept nil by mouth for 6 hours and discharged at a mean duration of 5 days (Range: 4–6 days).

Conclusions: Thoracoscopic procedures could safely and easily be performed even with limited facilities with modified position.

Keywords: Thoracoscopy, left endobronchial intubation, empyema.

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I. Introduction

Video-assisted thoracic surgery¹ is finding an ever-increasing role in the diagnosis and treatment of a wide range of thoracic disorders that previously required sternotomy or open thoracotomy. The potential advantages of video-assisted thoracic surgery include less postoperative pain, fewer operative complications, shortened hospital stay and reduced costs.

VATS is now being used extensively for pleural debridement in patients with empyema², lung biopsy and wedge resection to treat interstitial lung disease, mediastinal masses, and metastatic lesions.

Isolated right lung intubation is technically easy due to anatomical design of right bronchus and can be achieved just by over insertion of endotracheal tube but it is technically difficult to intubate left bronchus.

So here, we intubated patients with a newer approach with a conventional single lumen tube with modified position i.e. 45° tilt towards the contralateral side in an order to prevent spillage of secretion to the opposite side.

II. Methodology

A case study was conducted on 138 patients, below 12 years of age, those required right VATS and were exclusively needed isolated left lung ventilation. All patients had primary right lung pathology with otherwise normal hematological reports.

All patients underwent pre- anaesthetic check up to rule out difficult airway. Informed consent obtained from their parents. All patients were pre- medicated with Inj. Glycopyrolate 0.04 mg.kg⁻¹, Inj. Ondansetron 0.1 mg.kg⁻¹ and Inj. Fentanyl 1 mcg.kg⁻¹. Intravenous induction was done with Inj. Vecuronium 0.1 mg.kg⁻¹ and Inj. Thiopentone sodium 5mg.kg⁻¹. after adequate relaxation left endobronchial intubation was done with the novel approach³.

Left endobronchial intubation was confirmed by absent air entry on the right side of chest and presence of air entry on the left side of the chest by auscultation. Endotracheal tube was fixed with adhesive tape and then

position used was 45° tilt towards the contralateral side for surgical procedure. The infrastructure used included 5mm telescope, single chip camera, halogen light source, suction apparatus and 14 inch television. CO₂ insufflation was not used and ports were kept open.

HR, ECG, NIBP, EtCO₂ and SpO₂ monitored throughout the procedure. Anaesthesia was further maintained with O₂+ N₂O (60:40), Isoflurane with controlled mechanical ventilation. Intravenous fluid DNS given according to Holliday and Segar's⁴ 4-2-1 formula. At the end of surgery endotracheal tube was withdrawn and both lungs were inflated followed by patient reversed with Inj. Neostigmine 0.5mg.kg⁻¹ and Inj. Glycopyrrolate 0.04mg.kg⁻¹, it was decided to extubate while the child fully awake.

III. Discussion

Thoracoscopy⁵ is performed by use of single-lung ventilation of the contralateral side. The patient is positioned⁶ in the lateral position similar to the positioning used for a posterolateral thoracotomy. When VATS is done for drainage and evaluation of a pleural effusion, a single 1-cm port is usually sufficient. It is placed in the sixth or seventh interspace in the anterior axillary line. Through this port, the camera and a thin suction tip or biopsy forceps can be introduced and maneuvered. On the other hand, it requires manipulation of the airways, along with significant physiological changes and potential hypoxemia. So, achieving OLV in the pediatric population has posed a unique challenge to anesthesiologists. A review of the past literature shows various techniques^{7,8,9} and methods i.e. placement of a double-lumen bronchial tube, use of a single-lumen tracheal tube in conjunction with a bronchial blocker and insertion of a conventional endotracheal tube into a mainstem bronchus. But in infants and young children, the available sizes of the double lumen tubes or the Univent tubes do not match the anatomy of this age group. So, here we used a modified approach for isolated left endobronchial intubation along with modified surgical approach i.e. 45 degree tilt towards the contralateral side. In our study we used this modified approach in an order to prevent spillage of secretions from the non-dependent lung rather using lateral position which is used very commonly.

IV. Conclusion

We concluded that thoracoscopic procedures for right sided pathology could safely and easily be performed at periphery with this modified surgical approach along with conventional single lumen endotracheal tube.

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V. Conflict Of Interest

None declared

References

- [1]. Shah R, Reddy AS, Dhende NP. Video assisted thoracic surgery in children. *J Minim Access Surg* 2007;3:161-7.
- [2]. Ris HB, Krueger T. Video-assisted thoracoscopic surgery and open decortication for pleural empyema. *Multimed Man Cardiothorac Surg* 2004; 10:1510.
- [3]. Chaurasia B; A novel approach for isolated left endobronchial intubation with single lumen tube in paediatric patients. *IOSR Journal of dental and medical sciences*;2016,vol.15,issue 5 ver.IX.
- [4]. Arya VK. Basics of fluid and blood transfusion therapy in paediatric surgical patients. *Indian J Anaesth* 2012; 56:454-62.
- [5]. Chadrick E, Denlinger, ... Mark S. Allen, in *Clinical Respiratory Medicine* (Fourth Edition), 2012
- [6]. Loddenkemper R, Mathur PN, Lee P, et al. History and clinical use of thoracoscopy/pleuroscopy in respiratory medicine. *Breathe* 2011; 8: 144-155.
- [7]. Brooks JG, Bustamante SA, Koops BL, et al: Selective bronchial intubation for treatment of severe localized pulmonary interstitial emphysema in newborn infants. *J Pediatrics*; 1977, 91: 648.
- [8]. Kubota A, Kubota Y, Tachira T, et al: Selective blind endbronchial intubation in children and adults. *Anesthesiology*; 1987, 67:587-589.
- [9]. Baraka A: A simple tube for contralateral left bronchial intubation in children undergoing right thoracotomy or thoracoscopy. *Journal of Cardiothoracic and Vascular Anesthesia*; 1997, Vol. 11; 5:684- 685.
- [10]. Baraka A: Right beveled tube for selective left bronchial intubation in a child undergoing right thoracotomy. *Paediatric Anaesthesia*; 1966, 6:487-489.



Fig no. 1 patient position during procedure

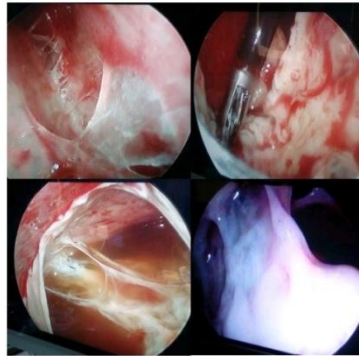


fig no. 2 operative collage



Fig no.3 infrastructure used for thoracoscopy

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