

Awake Video-Assisted Thoracic Surgery Under Fluoroscope Guided Thoracic Epidural in Patient with Severely Cardiac Dysfunction. a Case Report

Anil Kumar Bhiwal^{1*}, Naveen Chandra Patidar², Sheetal Chahar³, Purva Mandot³

¹ Associate professor Geetanjali Medical College and Hospital.

² Senior Resident Department of Anaesthesiology, Geetanjali Medical College and Hospital, Udaipur.

³ Junior Resident, Geetanjali Medical College and Hospital, Udaipur.

***Corresponding Author:** Anil Kumar Bhiwal, Associate professor Geetanjali Medical College and Hospital.

Received date: December 23, 2022; **Accepted date:** January 16, 2023; **Published date:** January 30, 2023

Citation: Anil Kumar Bhiwal, Naveen Chandra Patidar, Sheetal Chahar, Purva Mandot (2023), Awake Video-Assisted Thoracic Surgery Under Fluoroscope Guided Thoracic Epidural in Patient with Severely Cardiac Dysfunction. a Case Report, *J New Medical Innovations and Research*, 4(1); DOI:10.31579/2767-7370/035

Copyright: © 2023, Anil Kumar Bhiwal. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract:

Video-assisted thoracic surgery (VATS) is generally performed under general anesthesia however it can be performed under local or regional anesthesia in patients who unable to tolerate general anesthesia especially with poor cardiac and pulmonary reserve. Fluoroscope guided thoracic epidural may be a useful when blind technique is difficult to locate epidural space. Thoracic epidural technique resulted in decrease costs and shorter post-operative hospital stays however clinical outcomes is comparable to general anesthesia patients.

Here we reported a successful management of a awake thoracoscopic procedure under fluoroscope guidance epidural anesthesia with mild sedation while the patient kept spontaneously breathing in a 40-year-old woman with high cardiac risk. This patient showed a fast recovery without any complication of general anesthesia and effective postoperative analgesia through thoracic epidural.

Keywords: awake vats; cardiac dysfunction; fluoroscope; thoracic epidural

Introduction

General anesthesia with one lung ventilation is commonly used anaesthetic technique for Video-assisted thoracic surgery (VATS). [1] It can be performed under local or regional anesthesia in those who unable to tolerate general anesthesia especially with poor cardiac and pulmonary reserve and improve outcomes. [2] Procedures like pleural biopsies, wedge resections, decortications, and some time lobectomies can be safely performed using this technique. [3] Awake VATS resulted in decrease costs and shorter post-operative hospital stays while clinical outcomes is comparable to general anesthesia. [4] fluoroscope guided technique may be helpful in difficult epidural catheter insertion.

Here we reported a successful management of non-intubated awake thoracoscopic procedure for a 40-year-old woman with high cardiac risk under fluoroscope guidance epidural anesthesia with mild sedation while the patient kept spontaneously breathing. This patient showed a fast recovery without any complication of general anesthesia and effective postoperative analgesia through thoracic epidural.

Case Report

A 40 year old female was admitted in oncosurgery department with complaint of cough and right side chest pain and shortness of breath with NYHA grade II. On examination air entry was decreased on right side, SPO₂ was 94% on air. Patient had no other comorbidity. Her Hb was 9.4 gm% and total leucocyte count was 10400/mm³ while other blood investigation were found with in normal limit. Chest X-ray showed right plural effusion with collapse of lung. (Figure1) 2D Echo showed severely LV dysfunction with ejection fraction 35% and moderate pulmonary arterial hypertension. CECT chest showed right side hydropneumothorax with possibility of mesothelioma, crowding of ribs and mediastinal shift to right side. (Figure2) So awake thoracoscopy was planned under thoracic epidural in view of high cardiac risk and compromised pulmonary condition.

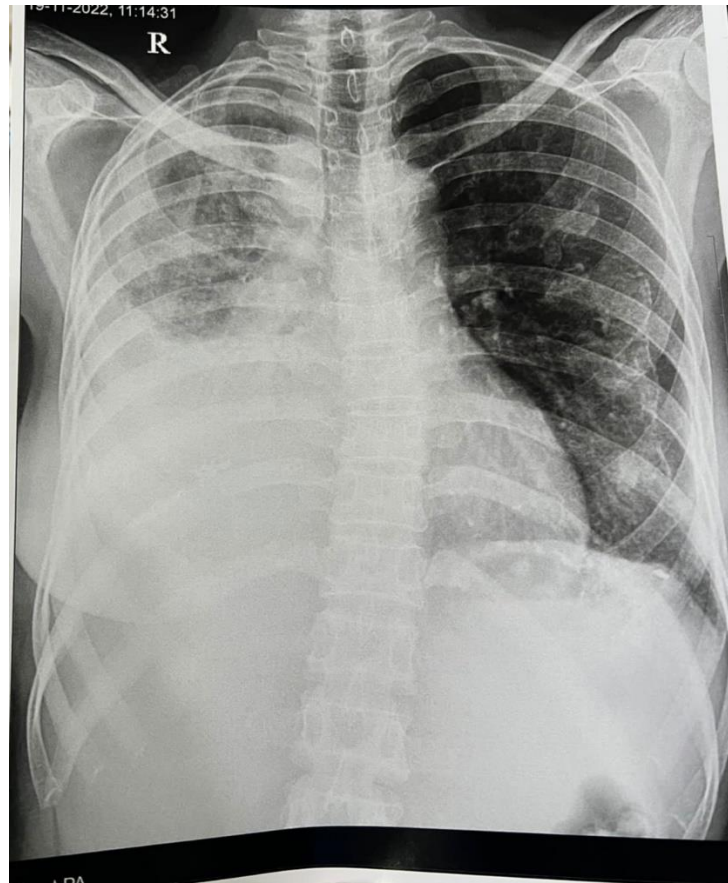


Figure 1: Chest Xray shows right pleural effusion with lung collapse.

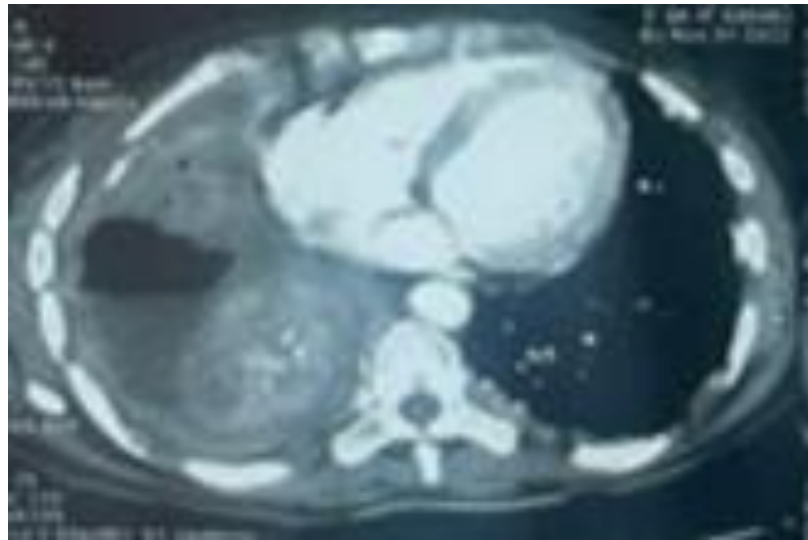


Figure 2: Chest CT scan shows a large amount of unilateral loculated effusion in the right lung.

Patient was optimized before surgery with nebulization, antibiotics and spirometry. Patient was taken for VATS with high risk consent under thoracic epidural. A large bore IV cannula was inserted and all standard monitor were attached for continuous monitoring of ECG, HR, NIBP, SPO₂. Epidural catheter insertion was tried in sitting and lateral position at T6-7 position but after multiple attempt it was not successful. Finally we tried with fluoroscope guidance in prone position and space was located with difficulty and confirmed by dye spread. Epidural catheter

was inserted and tip was kept at T4 level which was confirmed by dye. (Figure3) Bupivacaine plain 0.25 % 10 ml with fentanyl 50 µg was given by epidural catheter. Dexmedetomidine 50 µg was given intravenously over 10 min. After adequate sensory block at T1 to T10, surgery was started in left decubitus position. 6th rib was cut and thoracoscope was inserted. Whole parietal and visceral pleural is found inflamed and thickened. (Figure 4) Effusion was drained and multiple biopsy was taken. ICD was placed and closure done in layers.

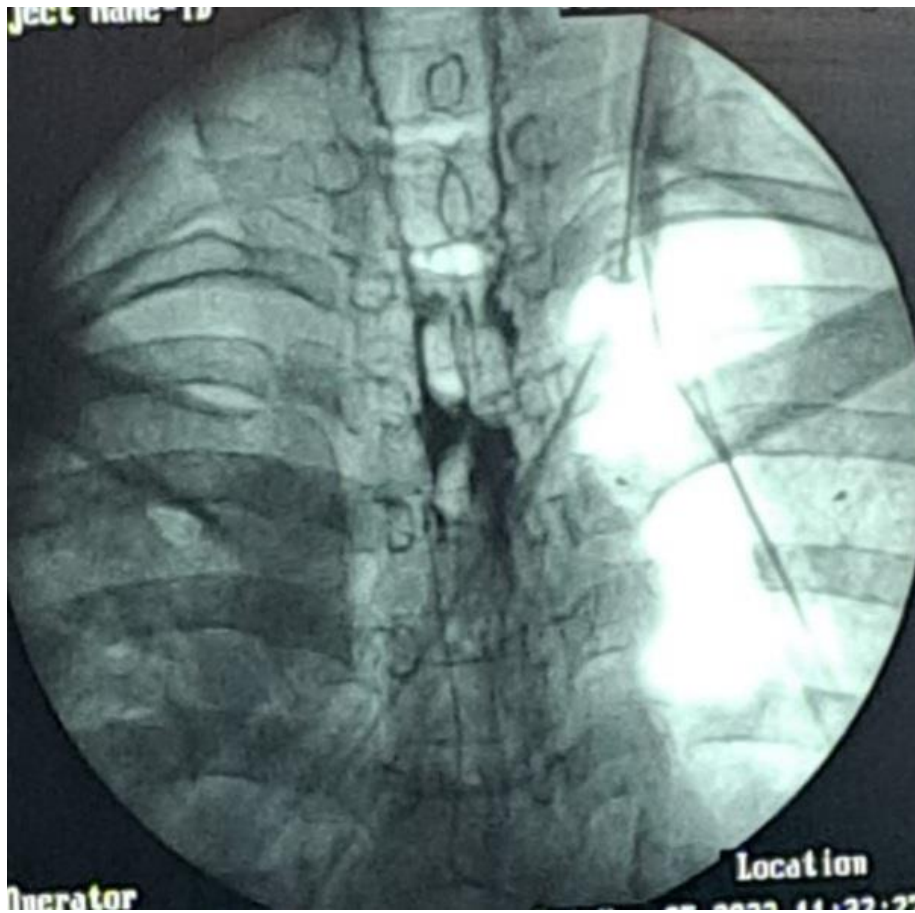


Figure 3: fluoroscope guided thoracic epidural catheter insertion.

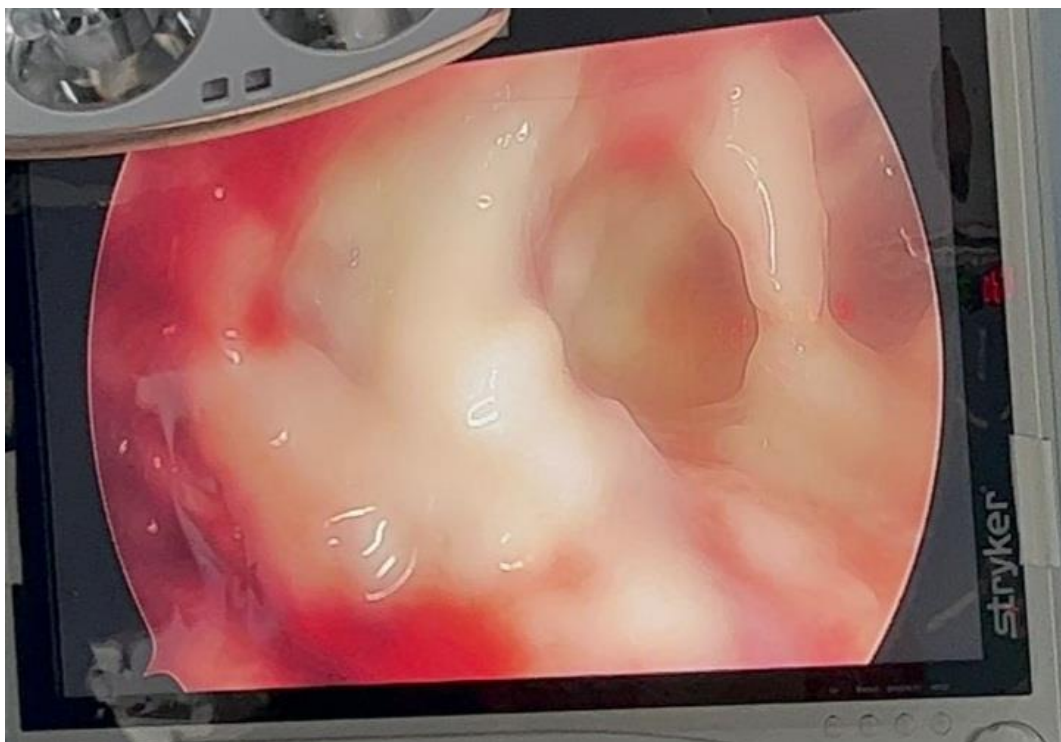


Figure 4: Intraoperative thoracoscopic findings.

Intraoperatively patients was maintain oxygen saturation with nasal cannula @ 6 L/min and hemodynamically stable. Patient was awoken during whole surgery and had no complaint of pain and discomfort. Paracetamol 1 gm IV was given and patient shifted to postoperative room for further monitoring.

Discussion

General anaesthesia with one-lung ventilation is the main anaesthetic technique for thoracic surgery but it has postoperative complications, such as lung injury, incomplete re-expansion and intubation related problems which increase mortality and morbidity. Lung injury due to mechanical ventilation may lead to interstitial edema, restricted lung compliance, loss of surfactant and ventilation-to-perfusion mismatch which may lead to hypoxic state for patient which results in tissue acidosis, alveolar edema, vascular congestion and cytokine release. [5]

Awake VATS is a minimally invasive thoracic surgery and successfully performed with regional anaesthesia. [6, 7, 8] Regional anaesthesia has advantage because it avoids complications of GA, that results in a lower morbidity and faster recovery. Regional anaesthesia also provides better hemodynamic stability, less thrombotic complications, and reduced surgical stress response compared to GA [9]. Regional anaesthesia, has some complications which occurs rarely but can be potential, such as epidural hematoma, spinal cord injury, and inadvertent high anaesthetic level.

Awake VATS technique has some disadvantage like total lung collapse is not possible because patient has spontaneous breathing intra-operatively.

In our case, the patient had severely systolic dysfunction with ejection fraction 35% and moderate pulmonary arterial hypertension. CECT chest showed right sided hydropneumothorax with mediastinal shift that would be a higher risk for general anaesthesia like intraoperative hemodynamically instability and postoperative respiratory complications related to one lung ventilation.

Regional anaesthesia for awake VATS has various techniques including thoracic epidural anaesthesia, intercostal nerve block, paravertebral nerve block and intrapleural analgesia. [10] Thoracic epidural provides a sufficient anaesthesia and postoperative analgesia for chest wall and pleural cavity therefore it is best choice for most thoracic surgeries. Ipsilateral stellate ganglion block and intrathoracic vagus nerve block can be used to abolish coughing reflex triggered by surgical manipulation.

We planned thoracic epidural anaesthesia and intravenous dexmedetomidine for mild sedation for awake VATS in this patient but epidural space was very difficult to locate with blind technique so we inserted epidural catheter with fluoroscope guidance. Fluoroscope provides live images to locate epidural space and prevent intrathecal and intravascular insertion. Postoperatively pain was controlled with top up dose by thoracic epidural catheter resulting in good postoperative pain control.

The overall conversion rate to GA ranges from < 1% to 9%. [11] The most common causes of conversion are surgical difficulties, such as strong adhesions, major bleeding, and significant mediastinal movement while non-surgical causes include suboptimal analgesia, persistent hypoxemia,

and tachypnea. Anaesthesiologist team should always be ready general anaesthesia with orotracheal intubation which is technically challenging for the anaesthesiologist at patient's lateral decubitus position. [12]

Conclusion

Thoracic epidural with mild sedation could be a feasible strategy for VATS in patients with complicated respiratory and cardiac function. Regional anaesthesia certainly reduced the length of hospital stay, overall costs and morbidity rates. Further difficult thoracic epidural insertion can be made successful with the help of fluoroscope guidance.

References

1. Heuer GJ. Empyema of the pleural cavity. *Ann Surg* 1923; 78: 711-724.
2. Katlic MR, Facktor MA. Video-Assisted thoracic surgery utilizing local anesthesia and sedation: 384 consecutive cases. *Ann Thorac Surg*. 2010; 90:240-245.
3. Kiss G, Castillo M. Nonintubated anesthesia in thoracic surgery: general issues. *Ann Transl Med* 2015; 3: 110.
4. Pompeo E, Tacconi F, Mineo D, Mineo TC. The role of awake video-assisted thoracoscopic surgery in spontaneous pneumothorax. *J Thorac Cardiovasc Surg*. 2007;133:786-790
5. Schilling T, Kozian A, Huth C, Bühling F, Kretschmar M, Welte T, et al. The pulmonary immune effects of mechanical ventilation in patients undergoing thoracic surgery. *Anesth Analg* 2005; 101: 957-965.
6. Lesser TG. Laser application enables awake thoracoscopic resection of pulmonary nodules with minimal access. *Surg Endosc*. 2012;26:1181-1186.
7. Noda N, Okada Y, Maeda S, Kondo T. Successful thoracoscopic surgery for intractable pneumothorax after pneumonectomy under local and epidural anesthesia. *J Thorac Cardiovasc Surg*. 2011;141(6):1545-1547.
8. Moon EJ, Go YJ, Chung JY, Woo Yi JW. Non-intubated thoracoscopic surgery for decortication of empyema under thoracic epidural anesthesia -a case report. *Korean J Anesth* 2017 June 70(3): 341-344
9. Piccioni F, Langer M, Fumagalli L, Haeusler E, Conti B, Previtali P. Thoracic paravertebral anaesthesia for awake video-assisted thoracoscopic surgery daily. *Anaesthesia* 2010; 65: 1221-1224.
10. Yang JT, Hung MH, Chen JS, Cheng YJ. Anesthetic consideration for nonintubated VATS. *J Thorac Dis* 2014; 6: 10-13.
11. Mineo TC, Tacconi F. From "awake" to "monitored anesthesia care" thoracic surgery: A 15 year evolution. *Thorac Cancer* 2014; 5: 1-13.
12. Gonzalez-Rivas D, Fernandez R, de la Torre M, Rodriguez JL, Fontan L, Molina F. Single-port thoracoscopic lobectomy in a nonintubated patient: the least invasive procedure for major lung resection? *Interact Cardiovasc Thorac Surg* 2014; 19: 552-525.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here:

Submit Manuscript

DOI:10.31579/2767-7370/035

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more at: <https://auctoresonline.org/journals/new-medical-innovations-and-research>