

Video Assisted Thoracoscopic Surgery (VATS) for Iatrogenic Lung Injury: A Case Series

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Abstract: The role of VATS is still being defined in the management of thoracic trauma. We report three cases of iatrogenic thoracic injury managed at our hospital via VATS. The first patient is a 35-year old man who developed tension haemothorax after pleural tapping for parapneumonic effusion. VATS was arranged to evacuate the haematoma and arrest bleeding from a right middle lobe artery via intracorporeal suturing. The second patient is a 68-year old lady who developed pneumothorax on the contralateral hemithorax after insertion of an internal jugular vein catheter for dialysis. The catheter was removed under direct vision during VATS, and the pleural defect was sealed with histoacryl glue and sutured intracorporeally. The third patient is a 34-year old lady who had a complicated surgery for a ruptured ectopic pregnancy. She developed nosocomial pneumonia with effusion which required a chest drain insertion. This was complicated with massive haemothorax. VATS was performed to evacuate the clots and cauterise the bleeding areas on the parietal pleura. All 3 patients did not require conversion to open thoracotomy; and made good recovery post operatively. In haemodynamically stable patients with thoracic injuries, VATS provides an accurate assessment of intra-thoracic organ injury and can be utilized to definitively and effectively manage injuries sustained as a result thoracic trauma. It gives the advantage of less pain, reduced post op pain and smaller scars when compared to thoracotomy.

Keywords: VATS, trauma, Thoracoscopic, atrogenic.

INTRODUCTION

The role of VATS is still being defined in the management of thoracic trauma. We report three cases of iatrogenic thoracic injury at Hospital Tengku Ampuan Rahimah which were managed via VATS.

CASE REPORTS

The first patient is a 35-year old man who was admitted to the internal medicine male ward for community acquired pneumonia with right parapneumonic effusion. He underwent needle thoracocentesis twice on admission to drain the parapneumonic effusion. After the second thoracocentesis, patient developed respiratory distress which required non-invasive ventilation. A CT thorax was arranged once patient was stable; it was noted that he developed right tension hemothorax; there was blood accumulation in the right pleural cavity causing mediastinal shift to the left. A chest drain was inserted and 2L of blood was drained, after which the surgical team was referred. Despite the mediastinal shift, he did not have haemodynamic instability. He was electively intubated before proceeding with VATS. There was extensive haemothorax from an arterial bleed from the middle lobe of the lung, which was secured with intracorporeal sutures (Vicryl v-lock®) [fig. 1]

The second patient is a 68-year old lady with underlying diabetes melitus, hypertension and end-stage renal disease on regular dialysis. She was admitted for internal jugular catheter insertion as her left brachio-cephalic fistula had thrombosed. *Left* IJV catheter was inserted, after which patient started complaining of chest pain. Air entry was reduced on the right lung. A CXR revealed the catheter tip was in the *right* hemithorax. An urgent CT thorax was done; no other vessels were injured. IJC catheter was removed under direct visualisation during VATS [fig. 2], and the defect in the parietal pleura was closed with histoacryl glue and intracorporeal suturing with Vicryl® 3/0.

The third patient was a 34-year old lady with no comorbidities who was admitted to the ICU after undergoing laparotomy for a ruptured ectopic pregnancy, sustaining iatrogenic bowel injury intra-operatively. Her stay was complicated with nosocomial pneumonia with parapneumonic effusion. A chest drain was inserted for the effusion, which was complicated with massive haemothorax. Referral was made to the surgical team in view of this. Patient was optimised and VATS was arranged for her. Bleeding was noted to

arise from multiple oozing point over the parietal pleura. Haemostasis was secured via cauterisation.

All three patients were hemodynamically stable prior to undergoing VATS. None required

conversion to thoracotomy. The first two patient were discharged well post op (Day 9 for the first patient, Day 4 for the second patient). The third patient continued her stay in ICU for another month due to sepsis from pneumonia and laparotomy wound breakdown.



Fig-1: V-lock® suturing arterial bleeding from right middle lobe



Fig-2: Removal of left Internal Jugular Catheter from right hemithorax

DISCUSSION

VATS has long cemented its place in the armamentarium of the thoracic surgeon. Jacobaeus is credited with the technique of thoracoscopy and the first clinical application dates from 1913. He performed adhesiolysis to enhance pneumothorax therapy of tuberculosis via a cystoscope introduced into the pleural cavity [1]. Prior to the 1990s, thoracoscopic surgery was largely limited to biopsy procedures, management of pneumothorax, empyema irrigation, sympathetic chain ablation, and removal of intrathoracic foreign bodies. The advancement of video imaging technology and the wider availability of stapling devices facilitated an increasingly wider use of thoracoscopy for diagnostic and therapeutic procedures [2].

The role of VATS in management of thoracic injuries is also expanding [3]. These three cases demonstrate several ways VATS can be used to manage trauma to the thorax. It is a valuable tool for the surgeon as it obviates thoracotomy and the complications associated with it when dealing with trauma to the thorax. Ben-Nun *et al.* studied the average time to resume normal activity was shorter in the group VATS. More than 2 years after discharge, the rate of return to a normal lifestyle was 81% in the VATS group and 60% of the thoracotomy group. Patients in the VATS group were generally more satisfied with their health status and surgical scars [4]. Manlulu *et al.* noted that the average hospital stay for patients post VATS was 5.86 days in their study, which was significantly shorter than patients who underwent thoracotomy [5].

Haemodynamic stability is a pre-requisite for under-taking VATS in a patient with thoracic injury, as VATS is technically demanding and required longer time to achieve haemostasis than thoracotomy. VATS allows for complete visualization of the diaphragm, thoracic cavity, mediastinum and pericardium. VATS also facilitates identification and evaluation of residual haemothorax and empyema. Repair of diaphragmatic injuries are easy with thoracoscopic approach [5]. The rate of missed diagnosis using VATS for chest trauma is 0.8%, with a 2% rate of procedure-related complications; that for conversion is 14–31% [6, 7].

CONCLUSION

In hemodynamically stable patients with thoracic injuries, VATS provides an accurate assessment of intra-thoracic organ injury and can be utilized to definitively and effectively manage injuries sustained as a result thoracic trauma. It gives the advantage of less pain, reduced post op pain and smaller scars when compared to thoracotomy.

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