

# Successful video-assisted thoracoscopic management of the right middle lobe torsion: A rare complication of right upper lobectomy - A report of two cases

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## ABSTRACT

Middle lobe torsion is an uncommon complication after right upper lobectomy. Clinical features are non-specific. CECT chest and diagnostic bronchoscopy are the essential investigations for the diagnosis. The treatment of choice is urgent re-exploration with either lobectomy or de-rotation with pneumopexy through thoracotomy or video assisted thoracoscopic approach based on the viability of lobe. Strong clinical suspicion and early surgical intervention are the key points for success. This report highlights the role of video assisted thoracoscopic approach in the management of this rare complication.

**KEY WORDS:** Middle lobe torsion, right upper lobectomy, video-assisted thoracoscopic surgery

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## INTRODUCTION

Torsion of middle lobe is a rare serious complication reported after right-sided pulmonary resections, more frequently after right upper lobectomy. This condition also has been reported after trauma and due to neoplasms and pleural effusion.<sup>[1]</sup> No clinical or radiological features are specific to this condition. Urgent open/video-assisted thoracoscopic surgery (VATS) re-exploration with a resection of nonviable lobe is the treatment of choice. Herein, we report two cases of the middle lobe torsion after right upper lobectomy and their successful VATS management.

## CASE REPORTS

### Case 1

A 40-year-old female, an old treated case of pulmonary tuberculosis, had a history of hemoptysis for 20 years. She

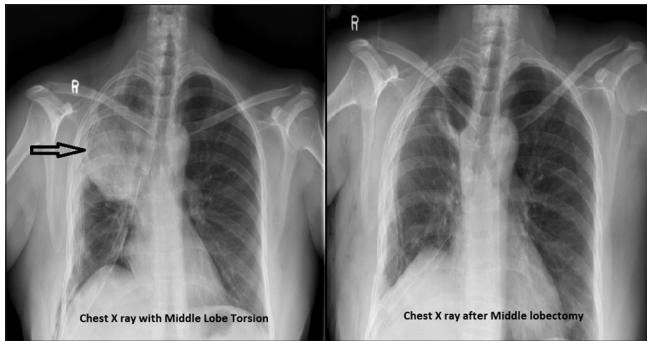
was treated symptomatically at each episode. On evaluation with contrast-enhanced computerized tomography (CECT) chest, bronchiectatic changes with fibrocavitary lesion were present in the right upper lobe requiring right upper lobectomy. She underwent uneventful VATS right upper lobectomy. She was clinically stable on the 1<sup>st</sup> postoperative day (POD). On POD 2, she had unexplained tachypnea, fever, and leukocytosis. Serial chest X-rays (CXRs) showed increasing opacity in the right upper zone [Figure 1]. CECT thorax was suggestive of avascular, malrotated middle lobe [Figure 2]. Bronchoscopy was also suggestive of narrowed and rotated middle lobe bronchus. Intraoperatively, the right middle lobe was found to be rotated >180° anticlockwise and was congested and nonviable. Hence, VATS right middle lobectomy was done. Thereafter, her postoperative course was uneventful.

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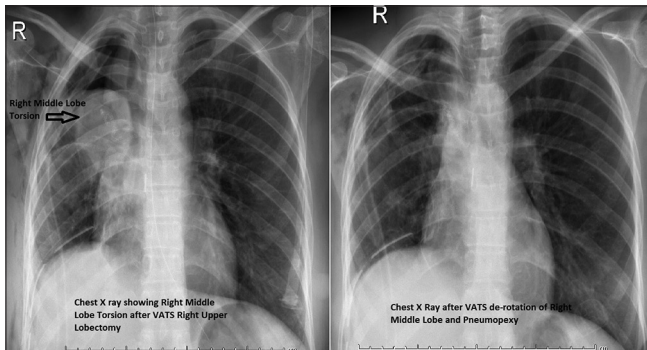
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**Figure 1:** Right upper zone opacification suggestive of middle lobe torsion



**Figure 3:** Chest X-ray suggestive of middle lobe torsion. Note well-expanded right middle lobe after derotation

**Case 2**

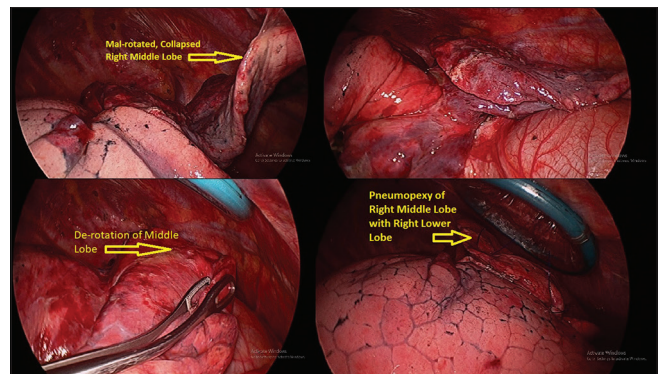
A 26-year-old female presented with complaints of hemoptysis for 2 years. CECT chest was suggestive of the right upper lobe bronchiectasis. She underwent VATS right upper lobectomy. Her CXR on POD 1 was suggestive of collapse of the middle lobe [Figure 3]. There was a strong suspicion of the middle lobe torsion in view of previous experience; hence, an urgent bronchoscopy was done, which showed slit-like opening of the middle lobe bronchus with torsion. She was immediately taken for re-exploration. Intraoperatively, the middle lobe was found collapsed and had 180° anticlockwise rotation, but was viable. VATS re-exploration and pneumopexy was done [Figure 4]. Her CXR revealed good lung expansion and was discharged on POD 2.

**DISCUSSION**

Lobar torsion is twisting of lobar parenchyma around its bronchovascular pedicle, causing airway as well as vascular obstruction resulting in collapse and ischemic necrosis of lung tissue.<sup>[2]</sup> Lobar torsion can happen postoperatively, secondary to trauma, and even spontaneously also.<sup>[1]</sup> Postsurgical lobar torsion is the most common scenario, particularly after right upper lobectomy. Right middle lobe is the most common lobe involved.<sup>[3]</sup> Predisposing factors are complete interlobar fissures, heavy consolidated lobes with long vascular pedicle, large pleural effusions, massive pneumothorax



**Figure 2:** Computed tomography chest showing middle lobe torsion



**Figure 4:** Intraoperative pictures of video assisted thoracoscopic surgery derotation and pneumopexy

and division/transaction of inferior pulmonary ligament after surgery or trauma.<sup>[4]</sup> Few authors also reported that VATS lobectomy can be a contributory factor in the development of lung torsion because of repetitive manipulation and rotation of the residual lobe during hilar and lymph node dissection.<sup>[3]</sup> In our experience, in both cases, middle lobe torsion happened after VATS right upper lobectomy. These patients had complete oblique fissure, which is a definitive predisposing factor.

Clinical features of this condition are nonspecific and usually may start from POD 1. They include breathlessness, cough, tachypnea, tachycardia hypoxia, and fever. Previous publications reported that presence of fever is probably a late finding, which may represent ischemic changes within rotated lobe, which requires lobectomy rather than derotation with pneumopexy.<sup>[5]</sup> Unfortunately, our first patient had fever and when we re-explored on POD 3, it necessitated lobectomy. The second patient was diagnosed early on POD 1 where we were able to avoid lobectomy. This finding highlights the role of strong clinical suspicion and early surgical intervention.

CECT chest and diagnostic bronchoscopy are the key investigations for diagnosis. CXR may reveal progressively increasing opacity, suggesting a collapsed or consolidated lung. Contrast-enhanced CT scan shows completely

collapsed lobe with ground-glass attenuation and lobe will typically enhance poorly. Cutoff of the bronchi and hilar vessels supplying the malrotated lobe is the characteristic sign.<sup>[4]</sup> Bronchoscopy shows bronchial occlusion with unusual orientation.<sup>[6]</sup> Infection, postoperative lobar atelectasis, aspiration pneumonia, and necrotizing pneumonia contribute to the close differential diagnoses. However, lobar torsion can be diagnosed by characteristic CECT and bronchoscopy findings, which does not fit any of these differentials.

Conventionally, the definitive treatment of lobar torsion is lobectomy or detorsion with pneumopexy through open thoracotomy based on the viability of lobe. However, the increasing expertise in the VATS among thoracic surgeons has made it possible to manage this complication through minimal access approach. This approach may offer possible benefits of decreased postoperative pain and shorter hospital stay over the open technique. However, few authors raised concerns over VATS management of lobar torsion; they reported that during surgery for lobar torsion, VATS may involve more frequent “moving, pressing, and turning over the rotated lobe,” which may aggravate the entry of toxic substances into the circulatory system, resulting in suboptimal clinical outcomes.<sup>[3]</sup> Our case report highlights the successful utilization of VATS in the management of this complex clinical entity. Nevertheless, suturing/stapling of the lobe to adjacent lobe or chest wall in every case as a prophylactic measure is a matter of debate as this may create air leaks and might involve extra costs.<sup>[2]</sup>

In conclusion, lobar torsion is rare but serious complication of pulmonary resections. VATS management of this complication may be considered as safe alternative to open surgery in experienced hands. However, further studies with larger numbers are needed to validate the

safety and efficacy of this approach. Best prophylaxis against this condition is by careful assessment of sufficient expansion, correct anatomical position of residuary lobes, and suturing it to adjacent lobes in selected cases.

#### **Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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#### **Conflicts of interest**

There are no conflicts of interest.

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