
CASE REPORT

Post-lobectomy Lung Torsion: a Report of Two Cases

SH Liu, FY Wan, JB Chiang

Department of Radiology and Imaging, Queen Elizabeth Hospital, Hong Kong

INTRODUCTION

Lung or lobar torsion can occur secondary to trauma (eg, traumatic pneumothorax) spontaneously, or more commonly after pulmonary surgery.¹ Lobar torsion following pulmonary lobectomy is considered a rare complication with an incidence of 0.09 to 0.4%.² Early recognition is important because rapid deterioration and death may result if the condition is not promptly managed. In this report, we describe two cases of postoperative lobar torsion that presented with non-specific symptoms, subsequently diagnosed on contrast computed tomography (CT).

CASE 1

A 49-year-old man underwent video-assisted thoracoscopic right upper lobectomy and systemic exploration of mediastinal lymph nodes for biopsy-proven right upper lobe adenocarcinoma with right hilar and paratracheal lymph node involvement. Chest radiographs on postoperative days 1 and 2 revealed increasing wedge-shaped opacity in the right middle zone (Figure 1). Bedside bronchoscopy on postoperative day 3 showed a tight orifice of the right middle lobe. Urgent CT scan showed collapse consolidation of the right middle lobe with poor contrast enhancement and mottled appearance (Figure 2a). The right middle lobe bronchus appeared

tapered with abrupt termination (Figure 2b). The right middle lobe pulmonary artery also appeared small in calibre and curved in an abnormal configuration (Figure 2c and d). With the suspicion of lung torsion, explorative thoracotomy was performed. The right middle lobe was found to be oedematous with a 90-degree clockwise torsion along the pedicle axis. Emergency lobectomy was performed with subsequent pathologic examination showing marked haemorrhage in the alveolar spaces. The patient was discharged 14 days after operation.

CASE 2

A 64-year-old man underwent video-assisted thoracoscopic right upper lobectomy for right upper lobe adenocarcinoma. Chest radiographs on postoperative days 0 to 2 showed increasing opacity over the right mid zone. Urgent CT scan revealed collapse consolidation of the right middle lobe associated with poor contrast enhancement and a mottled appearance (Figure 3a). The right middle lobe bronchus appeared tapered (Figure 3b) and the right middle lobe pulmonary artery appeared small in calibre (Figure 3c). Surgical emphysema was also noted (Figure 3a and b). Right middle lobe torsion was suspected, and endoscopy confirmed the suspicion with distortion of the right middle lobe distal bronchial tree. Explorative thoracotomy revealed a markedly congested

Correspondence: Dr SH Liu, Department of Radiology and Imaging, Queen Elizabeth Hospital, Hong Kong
Email: calebliu@gmail.com

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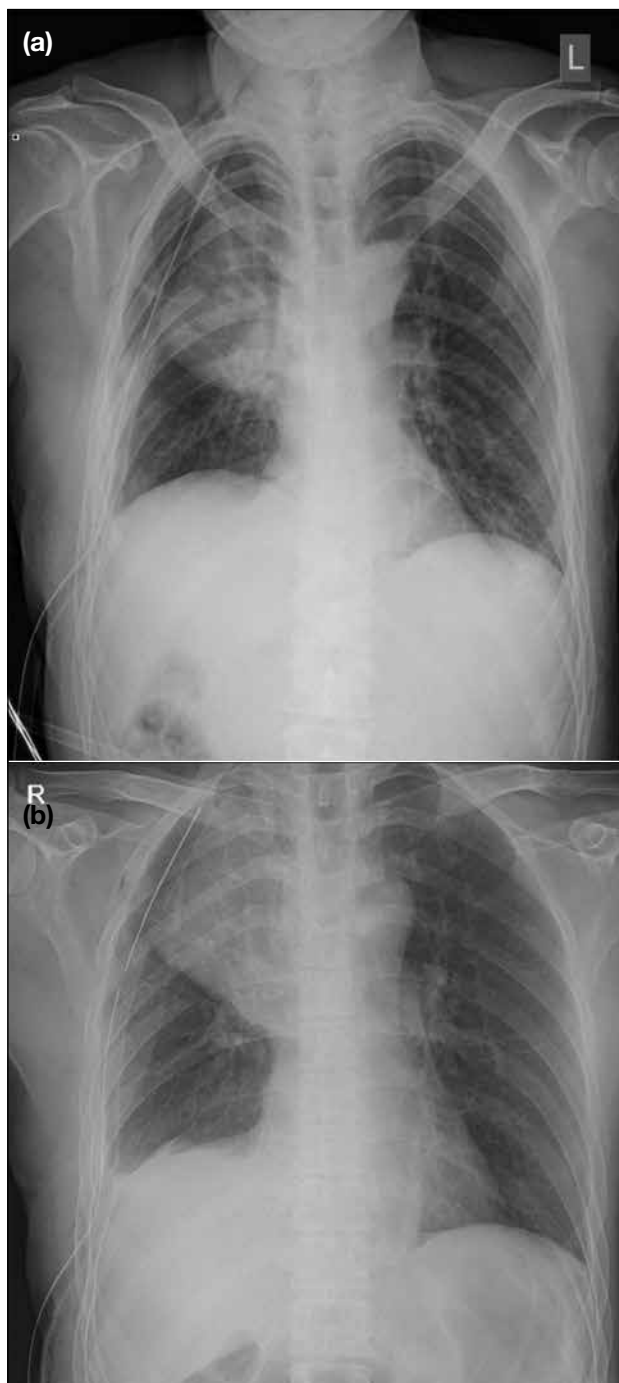


Figure 1. Chest radiographs on (a) postoperative day 1 and (b) postoperative day 2 showed an increasing wedge-shaped opacity in the right middle zone.

dusky right middle lobe with 180° clockwise rotation, confirming a right middle lobe torsion. Emergency lobectomy was performed and pathological examination confirmed a haemorrhagic infarct. The patient was discharged 12 days after the second operation.

DISCUSSION

CT has been increasingly used to aid diagnosis of lung or lobar torsion. In postoperative lung torsion, patients may initially be stable with non-specific symptoms and signs. Twisting of the bronchovascular pedicle may lead to pulmonary or lobar ischaemia, and consequent infarction or gangrene if left untreated. If the condition is not promptly recognised, it may lead to rapid deterioration (eg, shock and sepsis) and death.^{3,4} The most common predisposing factor for lobar torsion is recent right upper lobectomy. This accounted for three-quarters of cases in a literature review⁵ and was the preceding event in both patients illustrated in this case report.

Several radiographic signs have been described for pulmonary torsion, including rapid opacification of an ipsilateral lobe after lobectomy; unusual position or change in position of an opacity representing a collapsed or consolidated lobe; displacement of the hilum in an inappropriate direction for that collapsed lobe; and abnormal position and direction of pulmonary vascular markings.³ In right middle lobe torsion, a wedge-shaped opacity at the right side of the mediastinum is seen, with a sharp oblique demarcation as a result of inverted horizontal fissure.¹ These findings may raise a suspicion of lobar torsion. However, most patients do not present with these classic findings. Further evaluation with contrast CT is helpful to confirm the diagnosis.

Previously described CT findings include bronchial obstruction, hilar displacement, and unusual fissure configuration.⁶ Bronchial obstruction is not specific since it may occur from mucus impaction or a blood clot. Evaluation of fissure orientation and hilar position is challenging due to altered anatomy after surgery. More specific findings include poor enhancement of the involved lung parenchyma and abnormal configuration with twisting of hilar structures.

In CT pulmonary angiograms, the configuration of the pulmonary artery and branches can be evaluated. Cases of right middle lobe torsion can demonstrate vascular swirling on axial images. A specific imaging sign, the antler sign, was described in a recent study where pulmonary arteries were abnormally curved with all branches arising on the same side of the artery. However, it is only demonstrated in non-right middle lobe torsion.⁷ For better evaluation of pulmonary vasculature, three-dimensional reconstructions can be potentially useful to demonstrate twisting.⁸

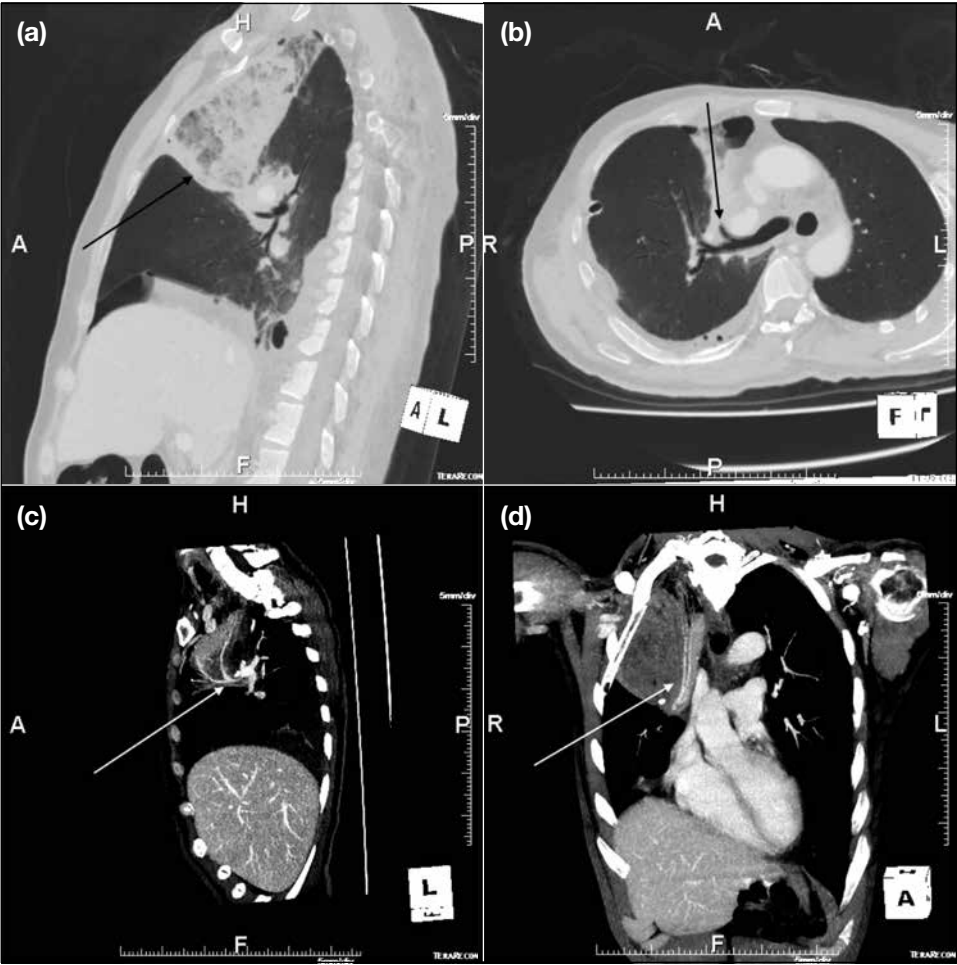


Figure 2. Case 1. Selected computed tomography images showing (a) collapsed right middle lobe with poor contrast enhancement and mottled appearance; (b) tapered right middle lobe bronchus; and (c, d) right middle lobe pulmonary artery small in calibre and curving in an abnormal configuration.

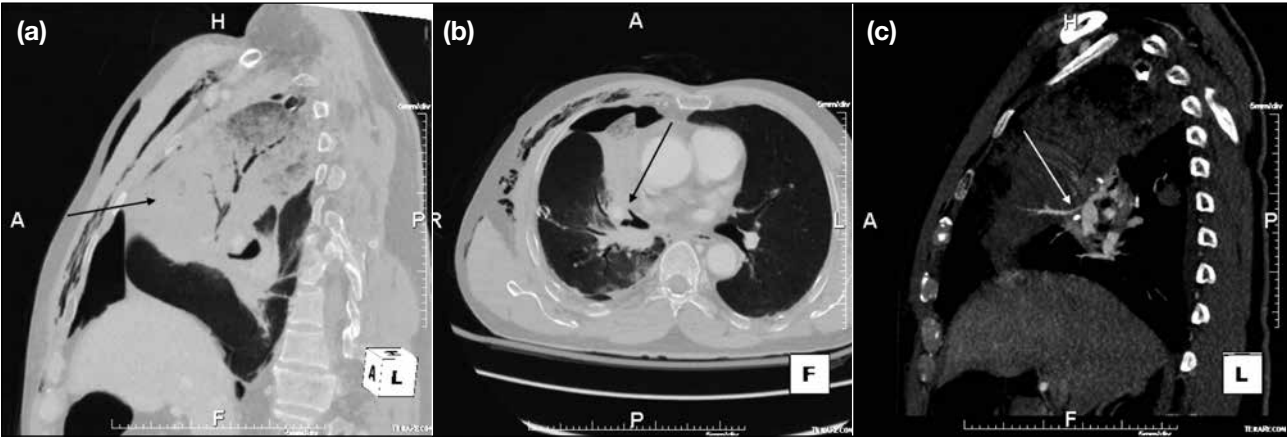


Figure 3. Case 2. Selected computed tomography images showing (a) collapsed right middle lobe with poor contrast enhancement and mottled appearance; (b) tapered right middle lobe bronchus; and (c) right middle lobe pulmonary artery small in calibre. Surgical emphysema is also seen in (a) and (b).

In our two cases, diagnosis of lobar torsion was made on the basis of both imaging and bronchoscopy findings. Conventionally, patients with suspected lobar torsion

will undergo optical bronchoscopy, as in our two cases. On optical bronchoscopy, a twisted or occluded bronchus may present with a “fish mouth” appearance.²

Niekel et al¹ raised the possibility of CT bronchoscopy from reformatted images, which can potentially obviate the need for further bronchoscopy that may delay surgical management. Gutiérrez Ramírez et al⁹ have reported the use of CT virtual bronchoscopy with good correlation with optical bronchoscopy in a case of right middle lobe torsion. If CT virtual bronchoscopy can replace conventional bronchoscopy, the time to diagnosis and surgery may be shortened, increasing the chance of lobe salvage. Nonetheless validation of the accuracy of CT virtual bronchoscopy in such a setting warrants further evaluation.

CONCLUSION

Awareness of lung torsion is crucial for prompt diagnosis and management. Early diagnosis may lead to salvage of the lobe before infarction occurs, especially for patients with marginal preoperative pulmonary function, and thus reduce morbidity and mortality. Radiologists should be aware of possible imaging findings, especially the specific radiological signs such as poor parenchymal enhancement and abnormal twisting of hilar structures. Additionally, evaluation of pulmonary vasculature with three-dimensional reformatted images can offer potential benefit in diagnosis. Whether CT virtual bronchoscopy

is adequate to replace conventional bronchoscopy requires further research.

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