



Lingular segment torsion following a left upper division segmentectomy



Naohiro Taira^{a,*}, Hidenori Kawasaki^a, Sayako Takahara^b, Tomonori Furugen^a, Takaharu Ichi^a, Kazuaki Kushi^a, Tomofumi Yohena^a, Tsutomu Kawabata^a

^a Department of Surgery, National Hospital Organization, Okinawa National Hospital, Okinawa, Japan

^b Department of Anesthesiology, National Hospital Organization, Okinawa National Hospital, Okinawa, Japan

ARTICLE INFO

Article history:

Received 15 May 2017

Received in revised form 28 July 2017

Accepted 30 July 2017

Available online 4 August 2017

Keywords:

Torsion

Lingular segment

ABSTRACT

INTRODUCTION: Numerous publications regarding lung torsion have reported lobar torsion after lobectomy. On the other hand, torsion of the remaining segment after segmentectomy is extremely rare. We herein report a rare case of lingular segment torsion following a left upper division segmentectomy.

CASE: A 68-year old female underwent thoroscopic segmentectomy of the left upper division. She underwent chest radiography immediately after the initial surgery, which revealed complete expansion on the operated side. Routine chest radiograph findings on postoperative day 1 demonstrated atelectasis on the operated side, although she did not have any symptoms. Chest computed tomography was conducted because a follow-up chest radiograph on postoperative day 5 showed no improvement, and she was diagnosed with torsion of the lingular segment. We performed an exploratory thoracotomy. Based on intraoperative findings, the lingular segment was found to have a 90° clockwise torsion along the pedicle axis, although the segment was viable. We straightened the kinked lingular segment and affixed the lingular segment to the left lower lobe. The postoperative course was uneventful.

CONCLUSION: Although lobectomy is the most common cause of lung torsion, physicians should check for lung segment torsion when performing segmentectomy.

© 2017 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Lung torsion after pulmonary resection is a rare complication of thoracic surgery, and its incidence has been reported to be 0.08%–0.2% [1]. Numerous publications regarding lung torsion have reported lobar torsion after lobectomy. On the other hand, torsion of the remaining segment after segmentectomy is extremely rare. We herein report a rare case of torsion of the lingular segment following a left upper division segmentectomy, based on SCARE criteria [2].

2. Case

A 68-year-old female underwent a left upper division segmentectomy for a partially solid ground-glass nodule measuring 10 mm. Intraoperatively, there was no anomaly in the location or branching of the pulmonary vessels or the bronchi. The oblique fissure was complete. There were no complications during surgery. She underwent chest radiography immediately after the initial surgery, which

revealed complete expansion on the operated side. Routine chest radiograph findings on postoperative day 1 demonstrated atelectasis and volume loss on the operated side (Fig. 1A), although she did not have any symptoms of fever or mild dyspnea. Chest computed tomography (CT) was performed because a follow-up chest radiograph on postoperative day 5 showed no improvement. Based on the CT imaging, we suspected torsion of the lingular segment due to consolidation and atelectasis of the left lingular segment (Fig. 1B), although bedside bronchoscopy confirmed patency of the lingular-segment bronchus. She underwent explorative thoracotomy. Based on the intraoperative findings, the lingular segment had approximately 90° of clockwise torsion, and the twisted lung had shifted from its original position to the superior side, although the segment was viable (Fig. 1C). We straightened the kinked lingular segment and affixed the tip of the lingular segment to the anterior basal segment (S8). The postoperative follow-up CT image demonstrated a sufficiently expanded lingular segment (Fig. 2). The postoperative course was uneventful.

3. Discussion

Lung torsion after pulmonary resection can occur in any lobe associated with a complete fissure in the absence of pleural adhesions [3], a long bronchovascular pedicle, or the presence of residual

* Corresponding author at: Department of Surgery, National Hospital Organization, Okinawa National Hospital, Ganeko, Ginowan City, Okinawa, 9012214, Japan.
E-mail address: naohiro.taira@yahoo.co.jp (N. Taira).

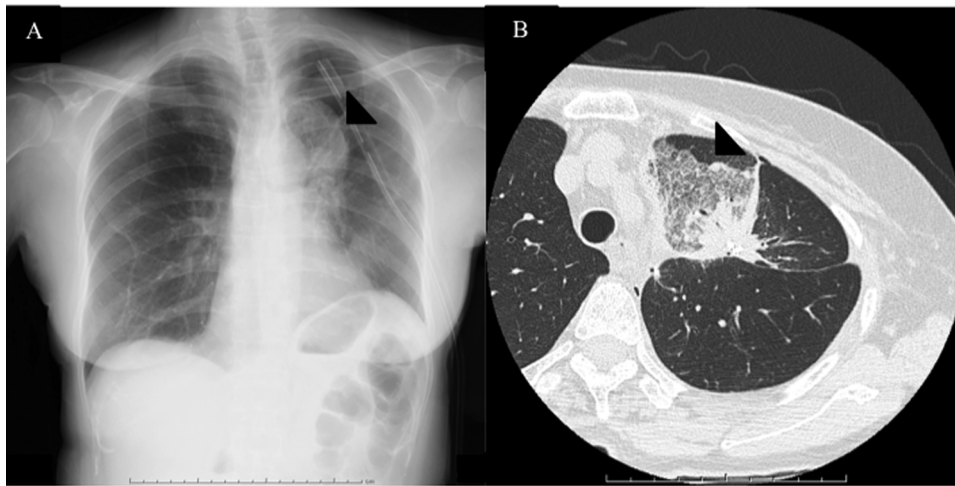


Fig. 1. (A): Chest radiograph showing atelectasis and volume loss (arrowhead). (B): Computed tomography imaging demonstrating consolidation and atelectasis of the lingular segment (arrowhead).

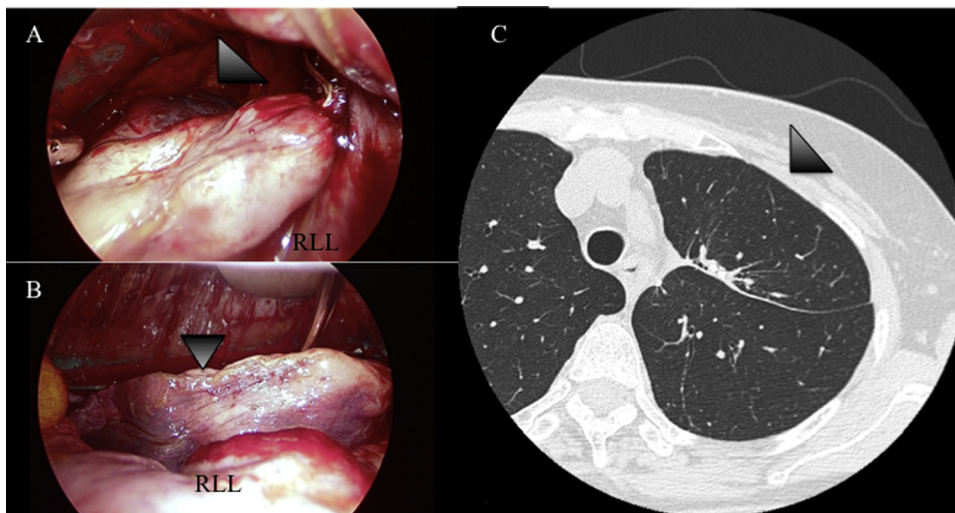


Fig. 2. (A): Intraoperative view of the congested lingular segment, which is twisted approximately 90° clockwise (arrowhead). (B): The surface color and compliance of the lingular segment improved after detorsion. (C): Computed tomography imaging shows a sufficiently expanded lingular segment after repair. RLL: right lower lobe.

pleural space [4]. Numerous previous reports regarding lung torsion have discussed lobar torsion after lobectomy. This may be because lobectomy is the gold standard of oncologic lung surgery lung although segmentectomy can be an option [5].

In the present case, increased mobility of the remaining lingular segment as a result of a complete fissure between the remaining lung and the increased space in the thoracic superior cavity seems to have been the main cause of the lung torsion. The reason for the maintained viability of the torted lung may be that the torsion angle was incidentally obtuse. According to some previous reports [1,5], more than 180° of rotation or angulation of the pedicle can produce acute obstruction of the bronchus, pulmonary artery, and vein, which induces atelectasis and ultimately results in pulmonary infarction and gangrene.

Although there are no diagnostic criteria for lung torsion, a bronchial occlusion on bronchoscopy or the physical findings including fever, tachycardia, and loss of breath sounds over the affected lung [1] may indicate lung torsion. However, in our case, there was patency of the lingular-segment bronchus and no clinical symptoms. If there are no symptoms or if bronchial occlusion is not observed by bronchoscopy but lung torsion was initially suspected by other image findings, prompt exploratory surgery can lead to

a satisfactory outcome. Although lobectomy is the most common cause of lobar torsion, physicians should consider the possibility of lung segment torsion when performing segmentectomy.

Conflicts of interest

Naohiro Taira and the other co-authors have no conflicts of interest in this manuscript.

Funding

Naohiro Taira and the other co-authors have no relevant financial interests to declare in this manuscript.

Ethical approval

All approval has been given.

Consent

The consent has been given.

Author contribution

Naohiro Taira: writing the paper, Hidenori Kawasaki: study concept, Sayako Takahara: data collection, Tomonori Furugen: data collection, Takaharu Ichi: data collection, Kazuaki Kushi: data collection, Tomofumi Yohena: study design, Tsutomu Kawabata: study design.

Guarantor

Naohiro Taira, Hidenori Kawasaki.

References

- [1] D.G. Cable, C. Deschamps, M.S. Allen, D.L. Miller, F.C. Nichols, V.F. Trastek, et al., Lobar torsion after pulmonary resection: presentation and outcome, *J. Thorac. Cardiovasc. Surg.* 122 (2001) 1091–1093.
- [2] R.A. Agha, A.J. Fowler, A. Saetta, I. Barai, S. Rajmohan, D.P. Orgill, The SCARE Group, The SCARE statement: consensus-based surgical case report guidelines, *Int. J. Surg.* 34 (October) (2016) 180–186.
- [3] B. Felson, Lung torsion: radiographic findings in nine cases, *Radiology* 162 (1987) 631–638.
- [4] E.A. Farkas, F.C. Detterbeck, Airway complications after pulmonary resection, *Thorac. Surg. Clin.* 16 (2006) 243–251.
- [5] T. Eguchi, K. Kato, T. Shiina, R. Kondo, K. Yoshida, J. Amano, Pulmonary torsion of the lingula following a segmentectomy of the left upper division, *Gen. Thorac. Cardiovasc. Surg.* 56 (October (10)) (2008) 505–508.

Open Access

This article is published Open Access at [sciencedirect.com](https://www.sciencedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.