Uniportal video-assisted thoracic lobectomy in a semiprone position for the treatment of a large intralobar pulmonary sequestration

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Abstract

Intralobar pulmonary sequestration (IPS) is a rare developmental abnormality of the lower respiratory system. Lobectomy by video-assisted thoracic surgery using a three-port or four-port technique is the generally accepted operative approach. However, lobectomy can also be accomplished with a single incision even if the IPS is large. This report describes the first case of a patient with a large IPS undergoing uniportal video-assisted thoracic lobectomy in a semiprone position.

Keywords: Pulmonary sequestration • Video-assisted thoracic surgery • Uniportal

CLINICAL SUMMARY

A 29-year old woman suffered from severe cough for nearly 1 year. Prior to admission to our hospital, she was referred to many hospitals for VATS but was declined because of the huge size of the lesion. A computed tomography scan performed in our hospital revealed a 12 cm × 10 cm-sized IPS in the left lower lobe, supplied by a 12-mm aberrant artery (Fig. 1) originating from the descending thoracic aorta. IPS was diagnosed, and a uniportal VATS lobectomy was scheduled.

Surgical Technique

The patient was placed in a semiprone position under general anaesthesia with single-lung ventilation. The surgeon and sole assistant both stood on the ventral side of the patient. A single 4-cm incision was made at the sixth intercostal space between the anterior axillary line and mid-axillary line. A plastic wound protector was used. A high-definition 30° 10-mm thoracoscope was placed at the posterior part of the incision.

Firstly, the surgeon stood cranially, holding a curved suction with the left hand and a harmonic scalpel with the right hand. The assistant stood caudally, holding a thoracoscope and an endoscopic grasper containing a small gauze to push the lung. The left lower lobe was lifted by suction, and the inferior pulmonary ligament was dissected from the pulmonary vein to the aberrant artery. The lower lung was pushed to expose the aberrant artery, which was mobilized from multiple angles to ensure sufficient length (Fig. 2) and subsequently cut using an endoscopic linear cutter (Video 1). Afterwards, the surgeon and assistant exchanged positions to perform a routine left lower lobectomy. The artery, vein and bronchus of the left lower lobe were mobilized and cut by an endoscopic linear cutter (Video 2). The specimen was put into a protective bag, and the bag mouth was retracted through the incision. The specimen was removed after it was cut into strips by scissors inside the bag. A chest tube was placed at the posterior part of the incision through the incision to drain the posterior thoracic cavity to the apex.

Total operative time was 104 min, and complete blood loss was ~20 ml. The chest tube was removed on postoperative day 1, and the patient was uneventfully discharged 3 days later. The severe cough disappeared immediately after the surgery. At 1-month follow-up, the patient did not have any complaints of cough, chest pain or chest numbness.

DISCUSSION

Since the first report on pulmonary sequestration resection by VATS in 1994 [1], many surgeons worldwide have reported on the feasibility and safety of the procedure [2]. Lobectomy by VATS is now generally accepted as an effective surgical approach for IPS. To our knowledge, there is only one previous case report of uniportal VATS for extralobar pulmonary sequestration [3], but no reports of uniportal VATS for IPS.

Uniportal VATS allows for a less invasive approach with superior cosmetic outcomes. We conducted our first uniportal VATS lobectomy in the semiprone position in May 2014 and have successfully treated more than 30 cases before the present patient. Of note, the number and changing frequency of the instruments should be minimized to facilitate uniportal VATS lobectomy, and the semiprone position promotes pushing of the lung and provides more manipulation angles, less workload and better ergonomics for both the surgeon and assistant [4]. Since Gonzalez et al.
reported it in 2011 [5], uniportal VATS lobectomy is no longer considered a highly difficult technique. However, in the present case, the huge lesion caused difficulties related to the exposure of the enormous aberrant artery and it was too huge and crisp to be grasped. The lower lung was dropped by gravity and did not need to be grasped with the patient in a semiprone position, which provided enough space to place the endoscopic linear cutter.

We have performed VATS for IPS in over 25 patients with IPS in our institute, and have previously attempted uniportal VATS for one such patient; however, this was converted to two-port VATS because of insufficient exposure of the aberrant artery, likely owing to the incision being too anterior. In the present case, we shifted the single incision backwards and gained better exposure of the aberrant artery. Furthermore, the surgeon stood cranially at first, which facilitated dissection of the inferior pulmonary ligament. By cutting the specimen into strips inside the bag, the lobe containing the huge IPS could be removed from the 4-cm incision.

In conclusion, uniportal VATS lobectomy in a semiprone position for IPS is a feasible and safe approach for the surgeons experienced with uniportal VATS lobectomy, and it may provide better cosmetic results with less postoperative pain.

Conflict of interest: none declared.

REFERENCES


