Closure of left-sided bronchopleural fistula by video-assisted mediastinoscopy: Is it always possible?

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Postpneumonectomy bronchopleural fistula (BPF) is a major challenge for thoracic surgeons. Despite widespread understanding of the risk factors, the incidence varies from 0.5% to 4.5% and the mortality is still as high as 71.2%.¹ Successful treatment requires an individual approach in each patient. We report our experience with closure of a left-sided BPF using video-assisted mediastinoscopy (VAM), describing the technical details.

Clinical Summary

We treated 2 patients who had left pneumonectomy for lung cancer in another center. About 1 month later, the symptoms began. The chest x-ray film showed an empty pleural cavity, and a flexible fiberoptic bronchoscope identified a fistula in both cases.

The first patient started coughing up clear sputum. The physical examination and laboratory findings showed no abnormalities. The chest computed tomographic scan measured a 17.3-mm stump (Figure 1). A standard VAM technique (the equipment and instruments have been previously described²) was done for closure. After a short cervicotomy, the dissection began on the anterior tracheal wall: first toward the right, we liberated the right bronchus and pulmonary artery below; continuing to the left, we freed the carinal region and bronchial stump. Care was taken to avoid injuring the left pulmonary artery stump. Afterward, the left tracheal wall was dissected to liberate the tracheobronchial angle. Then, following the tracheoesophageal groove, we identified and freed the posterior aspect of the stump and carinal region. An endodissector made clear the circumference of the stump. Finally, dissection was done for a minimum 1-cm long stump. Using an endo-GIA 30 stapler (roticulator; Auto Suture Company Division, United States Surgical Corporation, Norwalk, Conn) with the knife withdrawn, we sutured the stump. A peroperative fiberoptic bronchoscopic examination showed good airtightness. The patient was discharged on the second postoperative day.

The second patient had a right pneumopathy and quickly exhibited respiratory insufficiency (Figure 2). Broad-spectrum antibiotics and a chest tube were set up. At admission, he had an arterial oxygen saturation of 92% with 15-L oxygen flow. Blood gases were as follows: PaO_2 65 mm Hg and PaCO_2 31 mm Hg.

Figure 1. Chest computed tomographic scan (sagittal slice) measured the bronchial stump.

Then intubation was needed, but it was very difficult to maintain the selectivity and his condition continued to deteriorate. We did a VAM closure of the BPF and thoracoscopy to clean the pleural cavity (same operative time, patient supine). Postoperatively, his ventilatory parameters improved. Despite adapted antibiotics, the right pneumopathy did not improve, and he required increased high-pressure ventilation. Eight days later the BPF reopened, resulting in the patient's death.

Discussion

Management of BPF is difficult to assess. The best approach is to prevent it. Some basic principles to guarantee an optimal closure are as follows: insertion of sutures without tension, creation of a short bronchial stump, avoidance of excessive dissection, and gentle handling of tissues. When BPF occurs, a variety of methods have been proposed. On the right side, the bronchial stump is lacking in mediastinal coverage, which explains the difference in prevalence of right- and left-sided BPF.¹ The risk is still present on the left because of the technical difficulty of creating a short bronchial stump. Suturing the BPF can be done classically by transthoracic or transpericardial sternotomy.

Azorin and associates³ were the first to report the successful closure of a left-sided 2-cm long bronchial stump using VAM. Since then, no other experience has been published elsewhere. Spaggiari⁴ reported a video-assisted Abruzzini technique. The right anterior parasternal mediastinotomy is assisted by left parasternal thoracoscopic access and VAM. Like other anterior approaches, this technique allows good vascular control but less exposure for the bronchial tree, especially on the left side. Second, this technique was done only in a cadaver model. The lack of bleeding, the

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Figure 2. Chest x-ray film of patient 1 showing a left pleural cavity and right pneumopathy.

heart contractions or aortic pulsations, and the risk of opening the contralateral pleura make necessary a clinical study.

We showed the feasibility of VAM dissection in resecting the paratracheal mesothelial cysts.² Our cases showed the interest of using VAM for left-sided BPF. The dissection of the trachea through its natural route enables tracheal mobilization. The mediastinal shift is not a contraindication for VAM but represents a risk for contralateral pleural opening during transpericardial sternotomy or the modified AbruZZini technique.⁴ Previous mediastinoscopy is

not a contraindication inasmuch as the morbidity is not increased⁵ and there is a low risk of contamination. Our 2 cases showed good technical results. The first patient is still alive 2 years after the procedure. Unfortunately, the second patient died of severe sepsis. Perhaps all types of surgery in the presence of severe sepsis are risky.

In conclusion, each patient must be treated individually. The best method of closure must be based on the unique set of circumstances. Direct surgical repair can be achieved in most patients. The VAM technique is our choice for a long (at least 10 mm) bronchial stump on the left side because its specific morbidity is minimal compared with transpericardial sternotomy or a transthoracic approach.

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Gastric conduit staple line after esophagectomy: To oversew or not?

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After esophagectomy, continuity is frequently restored by means of gastric replacement. The staple line of this gastric conduit is generally oversewn to prevent leakage and erosion of adjacent tissue. This last step is often omitted during minimally invasive esophagectomy (MIE)

because technical difficulties make it time consuming.¹ Moreover, there is little evidence that supports the need for oversewing staple lines in gastrointestinal surgery. We describe two major complications that occurred after abandoning oversewing the staple line of the gastric conduit after esophagectomy.

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Clinical Summary

PATIENT 1. A 66-year-old woman with a squamous cell carcinoma of the midesophagus underwent robot-assisted thoracoscopic esophagectomy. Through a laparotomy, the resected specimen and abdominal lymph nodes were removed. By using the GIA-stapler (GIA 80, 3.8 mm; Tyco Healthcare, Norwalk, Conn), a 3-cm-wide gastric conduit was created.² The staple line was not oversewn.

On the first postoperative day, the left thoracic drain produced bile. Methylene blue was injected into the nasogastric tube, which was detected in the thoracic drain soon afterward. A contrast-enhanced radiographic examination of the gastric conduit showed