

Free omentum filling for bronchopleural fistula after lung resection



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The pleural cavity is filled with free omentum anastomosed to the cervical vessels.

CENTRAL MESSAGE

Bronchopleural fistula is a challenging complication after lung resection. We present a case of bronchopleural fistula after lung resection successfully treated with free omentum filling.

▶ Video clip is available online.

CLINICAL SUMMARY

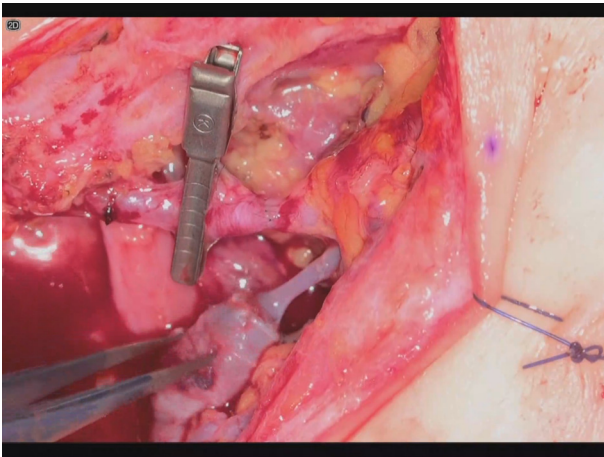
A 27-year-old woman who had undergone right upper lobectomy and partial right middle lobe resection for congenital bronchial atresia 6 years earlier presented to our hospital with a bronchopleural fistula (BPF) with aspergilloma. To control the infection, we performed an open window thoracotomy (OWT) with a 3-cm incision in the right second intercostal space in the midclavicular line. A silicone endobronchial stent (endobronchial Watanabe spigot [EWS]) was placed in the middle lobe bronchus via bronchoscopy, and negative pressure wound therapy (NPWT) was performed for 9 months. The patient was discharged, but BPF recurred 2 months later.

Given the patient's low body mass index of 16 and the apical location of the fistula, pedicled omentum filling was deemed inappropriate due to volume limitations and access challenges. Although muscle flap closure or thoracoplasty were potential options, we prioritized cosmetic outcome. Therefore, we opted for free omentum filling to optimize the therapeutic benefit of omentum while minimizing surgical invasiveness. We performed a repeat OWT, and the pleural cavity was kept clean by daily gauze changes for 1 month. A free omentum flap with the right gastrointestinal artery and vein was harvested

laparoscopically. The flap underwent end-to-end microanastomosis to the right transverse cervical artery and the right external jugular vein in the right neck using 10-0 Prolene sutures. The flap was tunneled subcutaneously through a tunnel created over the clavicle and sutured into the pleural cavity, filling the fistula tract and closing the window (Video 1). The omentum possessed sufficient volume to fill the cavity. A multidisciplinary team of thoracic, abdominal, otolaryngologic, and plastic surgeons performed the procedure. The cervical and thoracic incisions were 5 cm each (Figure 1). The patient has been followed for 4 years without recurrence of the fistula and computed tomography showed no cavity (Figure 2). The patient provided informed consent for publication of the information in this case report (IRB/ERB #3707; September 14, 2021).

DISCUSSION

BPF after lung resection is a difficult-to-treat complication of thoracic surgery. Conventional treatments include OWT, chest wall reconstruction, and various filling procedures. However, infection control is often difficult, which can



VIDEO 1. Bronchopleural fistula closure with free omentum. Video available at: [https://www.jtcvs.org/article/S2666-2507\(24\)00154-8/fulltext](https://www.jtcvs.org/article/S2666-2507(24)00154-8/fulltext).

lead to prolonged treatment and a significant decrease in the patient's quality of life. The goal of treatment is fistula closure, but the success rate is approximately 35%, and even if closure is achieved, the patient may be cosmetically compromised due to extensive chest wall reconstruction.¹ Recently, the effectiveness of NPWT in cleaning and narrowing thoracic empyema has been demonstrated, and successful treatment of BPF using an EWS in combination with NPWT has also been reported.²

Among the filling procedures, omentum filling is widely known to be effective. This is because the omentum is resistant to infection, has the potential to absorb infectious agents such as *Pseudomonas aeruginosa*, has rapid neovascularization at the cut end, has good granulation, and adheres to the



FIGURE 1. Minimal cervical and thoracic incisions of only 5 cm each, optimizing aesthetics.



FIGURE 2. Coronal computed tomography after 4 years of free omentum filling.

cavity without creating dead space.³ However, omentum filling is mostly performed for fistulas after lower lobectomy, and it is not possible to choose on the basis of the location of the fistula or the amount of omentum.

In addition to the good fistula and infection control possible with omentum, free omentum filling has 2 advantages. First, the entire omentum can be used at the recipient site. This maximizes the volume of tissue available for defect filling and may improve healing outcomes. Second, the choice of vascular anastomosis provides flexibility in surgical design, including options such as cervical or internal thoracic vessels. Recently, free omentum filling has been shown to be useful for reconstruction and wound coverage in the head and neck and extremities.⁴ This may be a new treatment option for BPF after lung resection, which has been difficult to cure.

In this case, we initially performed a small incision thoracotomy, EWS placement, and NPWT for cosmetic reasons, but this treatment plan was unsuccessful. When BPF recurred, we prioritized definitive treatment and planned a free omentum filling. Free omentum flap with cervical anastomosis achieved BPF closure and superior cosmesis compared with muscle flap or thoracoplasty, despite residual neck, chest, and abdominal scarring.

Conflict of Interest Statement

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling manuscripts for which they may have a conflict of interest. The

editors and reviewers of this article have no conflicts of interest.

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