

# Split-thickness skin-grafting the post-Clagett pleurostomy cavity

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Among the surgical complications of pulmonary resections and pneumonectomies, bronchopleural fistulae (BPF) persists as the gravest complication for the thoracic surgeon. BPF can prolong hospital stay and increase mortality to a rate of 50%.<sup>1</sup> Its management is challenging and controversial. We report our recent experience with empyema and late BPF in a patient after pneumonectomy for a lung abscess.

We undertook a novel management technique of Clagett pleurostomy followed by split-thickness skin-grafting of the residual pleural space. Applying split-thickness skin grafts to the granulating tissue bed accelerated epithelial migration. The technique was simple and required a short-term anesthetic. One year later, the result remains satisfactory.

## Case report

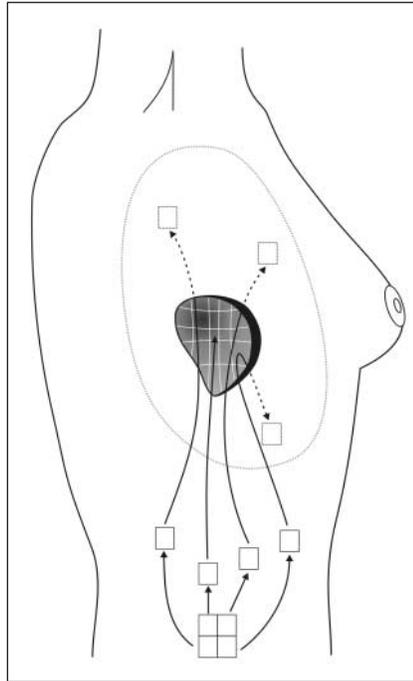
Because of tissue scarring in her lung, a 55-year-old woman had a right upper lobectomy. Several years later, after developing respiratory problems associated with a right-lung abscess, she underwent a completion pneumonectomy. This was complicated postoperatively by a pneumothorax and purulent bronchitis requiring a brief course of mechanical ventilation and a doxycycline pleurodesis.

Leading up to the hospital admission being described, the patient was coughing up foul-smelling phlegm, had lost 9.1 kg (18% of her pre-morbid weight) and felt tremendously weak and tired all the time. She was admitted with a diagnosis of right-sided empyema and left-sided pneumonia.

Conservative therapy failed to improve her respiratory symptoms. Bronchoscopy confirmed the diagnosis of BPF. Insertion of a chest tube for drainage helped ease her symptoms. She underwent a Clagett pleurostomy on her right side; over the next 3 weeks, firm, granulating tissue developed on the interior of the cavity.

Back in the operating room, a split-thickness skin graft was harvested from her thigh. This was divided into 5-cm<sup>2</sup> patches and applied to the right hemithorax (Fig. 1). They were then covered with gauze impregnated with petroleum jelly; the thorax was packed with gauze. Seven days later, when the packing was removed, the graft “take” was found to be excellent.

At follow-up 1 year later, the patient was back to her pre-morbid weight and reported that her energy level had returned to normal (Fig. 2). Only a small area near the apex remained open where the BPF continued to drain slightly. With a water-



**FIG. 1.** Diagram of the procedure. Split-thickness skin was harvested from the right thigh, cut into patches 5 cm square and applied to the interior of the cavity. The grafts were covered with Vaseline-impregnated gauze, and the cavity gently packed with gauze.



**FIG. 2.** A photograph of the patient at follow-up 1 year later. She is lying in a left-lateral decubitus position displaying the healed post-Clagett pleurostomy cavity.

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tight dressing, she was able to bathe and shower. She was pleased with the result.

### Discussion

Late BPFs require management of the empyema before control of the communication can be gained. In 1963, Clagett and Geraci<sup>2</sup> described an open-window thoracostomy to deal with the empyema. The procedure rapidly improves the patient's general condition, and 20% of smaller fistulae will close spontaneously with dependent drainage.<sup>3</sup>

Once stable, closure of the residual fistula can be attempted, but is seldom successful.<sup>4</sup> Because of the proximity of the great vessels, scarring and the chronically inflamed nature of the tissue, dissection to locate the tiny hole is difficult. Secondary closure of the bronchial stump can be reinforced with autogenous tissue, which has a reported success rate of 50% to 70%.<sup>2</sup> However, this technique adds a significant operative and anesthetic burden onto the patient, which may not be well tolerated, as in our patient. Other options include transsternal transpericar-

dial closure of the BPF, with its high success rate but the disadvantage of a sternotomy. The use of vacuum technology to clean and close these wounds remains experimental.

The technique applied in this case was simple, required a brief anesthetic, and had a cosmetically acceptable end result. The wound bed, once cleaned through the Clagett pleurostomy, was an excellent candidate for skin grafting. Applying split-thickness skin grafts to the granulating tissue bed essentially accelerated the normally slow epithelial migration. The graft provided coverage around the small BPF and a barrier for the rest of the pleural cavity from further bacterial contamination.

In this case, we did not surgically obliterate the remaining cavity. The patient has done well with a minimal amount of drainage from the area. Although this procedure is not ideal, we feel that this is a viable option for late, small BPFs, especially for patients who are at high risk in the setting of lengthy anesthesia. It provides a simple, safe alternative to more complex procedures

and in this case was well tolerated by the patient.

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**Competing interests:** None declared.

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