

## Closure of Post-pneumonectomy Space and Bronchopleural Fistula: Suction Pump and Flap Closure

In the unfortunate situation of a post pneumonectomy bronchopleural fistula or empyema the first steps as discussed in the previous chapter are to drain the space, evaluate the fistula and improve the patient's general condition. Often, as soon as the space is drained, antibiotics commenced and good nutrition and hydration established the patient rapidly improves.

Once this has been done and the patient stable the wound is opened and if possible the fistula is closed. If there is a high chance of closure and regaining sterility of the space a trial of this takes place. This arises uncommonly and virtually only after discovery of a small fistula very early after surgery.

If sterility is unlikely to be achieved it is better to create a pleural window (a modified 'Clagett' procedure). The position of this should consider the position of the previous thoracotomy and the likely type of closure. It is generally placed laterally close to the diaphragm and requires the removal of at least a 4–6 cm long portion of two adjacent ribs. The skin edges are undermined and stitched in to or as close as possible to the pleural surface. The wound is then packed with a warm moist large gauze pack. The first 1–2 pack changes may need to be done in theatre under a short general anaesthetic and should be done 2–3 days apart. Thereafter this can be done on the ward with analgesia and sometimes a little sedation. After the third change the packs can be switched for a continuous suction system. Over the mediastinal surface a non-adherent dressing is placed on top of which a sterile sponge suitable for a continuous suction system is placed. A large adhesive dressing is placed over this and low suction applied. If a fistula is still present it has to be small and itself covered by a completely occlusive dressing to prevent air being sucked out. The patient should be seen weekly by a tissue viability specialist nurse to check that progress is being made.

Usually within a few weeks the space will reduce considerably in size. During this period the window is prone to contract

down and revision surgery to enlarge it may be needed. This may need to be done a number of times.

In this period the patient should be encouraged to be active and eat well as they need to be in good condition for subsequent space closure.

It is prudent for them to be seen by a specialist plastic surgeon with experience in such closure to discuss choice of flaps.

Before embarking on definitive closure a staging CT and any other necessary investigations should be performed to exclude recurrence. The CT also allows very good appreciation of the size of flap required for closure.

### 43.1 Closure

Several flaps, both free and pedicled have been described. We have found that because the latissimus dorsi has been damaged as part of the thoracotomy and the serratus generally does not have much mass or length they are not of much use. Omentum often does not have enough bulk and does not carry a skin flap to close the wound. For this reason we generally use myocutaneous flaps which may be pedicled or free flaps anastomosed to local vessels. In different cases we have variously used rectus abdominis, deep inferior epigastric and contralateral latissimus dorsi.

The principle of this operation which is performed jointly by plastic and thoracic surgeon is to suture the well vascularised muscle to the mediastinal surface obliterating any potential space and covering the site of the former fistula. The flap is a combined flap with fat and skin. This portion is used to close the skin wound and also provides a way of monitoring the graft. The sutures should be strong. Our preference is 2/0 or 3/0 polypropylene or ethilon.

In the perioperative period drains are placed into any potential spaces and are removed over a few days. The blood supply is monitored for the first 2–3 days by ultrasound and regular review by the plastic surgery service is essential.