



# "Hope Chest": A Review of the Imaging Findings of the "Eloesser Flap" Thoracostomy Window and Clagett Thoracotomy



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## BACKGROUND

Radiologic imaging plays a routine but essential role in the perioperative management of modified Eloesser Flap thoracostomy and Clagett thoracotomy.

Eloesser flap thoracostomy is a lifesaving operative treatment of refractory pleural empyema in debilitated patients unable to tolerate decortication, allowing for a permanent one-way valve for drainage of the pleural space infection. Clagett thoracotomy is a 3-stage procedure and offers an open thoracotomy window that differs in that the Clagett window is larger and reversible. Both surgical options involve extensive postoperative pleural drainage and care.

Chest radiographs and computed tomographs (CT) are essential in the postoperative monitoring. Our objective is to review the radiographic changes with Eloesser flap and Clagett window evaluation of complications.

## PURPOSE

We review the radiologic appearance associated with the creation of the Eloesser flap thoracostomy window and Clagett open thoracotomy window. We discuss the choice of imaging studies to ensure optimal management of chronic empyema in these patients.

## RESULTS

Eloesser flap and Clagett window are difficult to differentiate on imaging. Both operations require surgical resection of 2-4 consecutive lower ribs and flap consisting of muscle, skin, and subcutaneous fat, better discernible on CT images than radiographs. Journal of Operative Techniques in Thoracic and Cardiovascular surgery describes Clagett window as considerably larger than an Eloesser flap. However, this was difficult to appreciate from the images in our study.

Chest radiographs remain the accessible option for frequent follow up imaging. Both procedures require antibiotic irrigation and daily packing changes in the initial weeks. It is important to search for any inflammation at the flap placement which may occur with multiple dressing changes daily. Postoperatively, imaging play a vital role in location of complications, including re-accumulation of empyema. Elevation of the ipsilateral hemidiaphragm, collapse of the ipsilateral lung, and pneumothorax can be seen with loss of negative intrathoracic pressure.

## POST-OPERATIVE CHANGES



Fig. 1

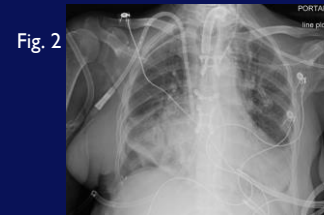


Fig. 2

**Figure 1. Eloesser flap thoracostomy, chest x-ray post-operative day (POD) #1.** Amorphous opacities within the pleural cavity consistent with antibiotic infused packing. Irrigation with an antibiotic solution of the thoracic cavity is expected in the initial days post op and daily packing changes in the initial weeks. **Figure 2. Eloesser flap thoracostomy POD #2** of the same patient. Focal chest wall deformities with surgical resection of ribs 8 and 9. When radiopaque markers are not present, surgical packing can be mistaken for consolidated lung.



Fig. 3

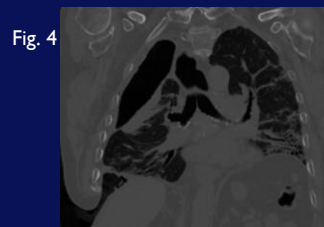


Fig. 4

**Figure 3. Eloesser flap thoracostomy coronal CT reconstruction.** Pneumothorax can be seen with loss of negative intrathoracic pressure. Vacuum-assisted closure (VAC) device is placed over the thoracostomy window. **Figure 4. Clagett thoracostomy.** A large loculated pneumothorax is seen in the right upper hemithorax.

Fig. 5



Fig. 6



Axial CT of the modified Eloesser flap (Figure 5) and Clagett (Figure 6) are difficult to differentiate on imaging. Both CT images show focal wall deformities and minimal air within the thoracic cavity. In literature, Clagett window generally has a larger opening than an Eloesser flap. However, the two images show Eloesser window with a larger opening than the Clagett flap. We find that the size of the opening is not a reliable assessment in differentiating surgical thoracostomies.

## CONCLUSIONS

Even with advancement in medical treatment of empyema, Eloesser flap thoracostomy and Clagett open thoracotomy continue to play a lifesaving role in treatment of refractory empyema.

Radiologist's understanding of the radiologic changes in thoracic appearances and post-operative complications is important in the post-surgical management of these patients.

## References

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