Using the open window thoracostomy (Eloesser window) in chronic pleural empyema

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ABSTRACT The authors present a case of chronic pleural empyema solved by open window thoracostomy (Eloesser window).

KEY WORDS hyperchronic empyema, open window thoracostomy, Eloesser window

Introduction

Despite the fact that the incidence of chronic pleural empyema dropped significantly because of the noticeable improvement of the antibiotic treatment, these types of pleural affections continue to create serious problems of surgical therapy.

There are multiple surgical procedures of treatment, such as thoracostomy drainage (associated or not with antiseptic pleural lavage), the intra-pleural administration of fibrinolytic agents (streptokinase, urokinase), thoracoscopic procedures and major surgical interventions, such as pleuropulmonary decortication and thoracoplasty.

Choosing the optimal surgical procedure in chronic empyema remains a controversy and depends on the age of empyema, the general state of the patient, the associated illnesses, the presence of bronchopleural fistula, and the type of the microbial germ involved.

The open thoracic window drainage conceived by Eloesser in 1935 for tuberculous empyema underwent a lot of improvements in time, having applications to patients with hyperchronic pleural empyema (with or without bronchopleural fistula) that does not tolerate major surgical procedures.

Clinical case

We present the case of a 54 years patient, with multiples admissions in the last 20 months in the Thoracic Surgery Clinic of the Craiova County Emergency Clinical Hospital for left hyperchronic pleural empyema, solved by open thoracic window (Eloesser window).

At the moment of the first admission, the patient presented the alteration of his general state, serious physical astheny, important dyspnea, cyanosis of the extremities, cough and left thoracic pain.

The initial radiography showed a left piopneumothorax that lead us to thoracostomy drainage. The cultures from the harvested pleural liquid revealed Klebsiella Pneumoniae.

The evolution after the first draining was sow, the patient being drained many times (maintaining the same cutaneous orifice), but despite the focused antibiotic treatment and repeated intrapleural lavages using betadyne, we could not achieve the sterilization of the empyema pouch.

The following thoracic radiographies revealed the gradual development of an intense calcareous pahypeuritis process that was encircling the laterobasal empyema pouch.

Considering the poor biological status of the patient (important weight loss due to the prolonged septic condition), we decided to practice a surgical procedure less aggressive than pleuropulmonary decortication, namely the open window thoracostomy drainage (Eloesser type window).

Surgical technique

1) Before the intervention we performed a fistulography that helped us in locating the region of placing the future window, in the most declive part of the cavity. (fig. 1)

2) We practiced an “H”-shaped incision centered on the drainage orifice, with the circular excision of the devitalized area, due to the...
prolonged drainage, but saving the tegumentary resources.

3) We prepared 4 trapezoidal epidermal-subcutaneous flaps resulted following the incision, decollating them from the underlying muscles. (fig. 2)

4) We practiced the segmental resection of 3 ribs (C8, C9, C10) for approx. 8 cm, at the level of the lateral arches, obtaining a window situated at the base of left hemithorax, centered on the posterior axillary line.

5) A good hemostasis was achieved at the level of both extremities of the intercepted intercostal vascular package for each resected rib.

6) We evacuated, curetted and abundantly washed the empyema cavity with physiological serum with betadyne and practiced a precise resection of the calcareous pahypleuritis plates that were covering its walls.

7) The edges of the 4 flaps were flanged towards the inside and sutured to the parietal pahypleuritis with a «U» suture point placed as deep as possible into the window. Also, we joined with separate sutures every 2 adjacent flaps. (fig. 3)

8) The remaining cavity, of large dimensions (20/15 cm), was filled with compresses impregnated in betadyne.

Postoperative follow-up and results

The daily toileting of the thoracic window consisted in removing the secretions and tissue detritus, abundant lavage with physiological serum with betadyne and filling the cavity with dry compresses.

We noticed since the first postoperative days the occurrence of granulation areas at the level of the cavity walls and the dramatic diminishing of the secretions, as well as the significant improvement of the patient’s general state. (fig. 4)

In order to objectively evaluate the diminishing of the cavity, we measured weekly the volume of sterile physiological serum that can be instilled up the level of ribs plan, the initially determined volume being 340 ml.

We removed the suture points 10 days after the surgery and starting with the second week we increased the interval between the local toileting to 2 days and, subsequently, to 3 days.

The patient had a radical improvement of the general and biological state, with the disappearance of the septic state and the resuming of the ascending weight curve, reasons that allowed us the discharge 3 weeks after the surgery.

At present, he is followed up by his family doctor for the window toileting (twice a week) and every two weeks in our department.

We could notice the diminishing of the cavity volume of approx. 10 ml/week. Although we cannot rely on a linear decrease of this volume, we can anticipate an evolution towards a quasi-total occlusion of the thoracic window through epithelization, in the next 9-10 months.
Discussions

Leo Eloesser conceived the method of open thoracic window in 1935 for the acute tuberculous empyema (1). At present, the open thoracic window drainage has multiple applications, the main indications being (1, 4, 6, 7):

- chronic and hyperchronic empyema, with or without bronchopleural fistula, in the presence of the lung fixed to the wall outside the empyema pouch;

- postoperative empyemas (lung resections for cancer, tuberculosis etc.), especially postpneumonectomy with bronchial fistula.

These patients do not respond well to the conventional therapy with pleural drainage and antibiotics and have a poor biological condition that does not allow pulmonary decortication or thoracoplasty (2, 3, 4, 6, 7).

It is important to mention that in the empyema in an early evolution phase, the procedure should be avoided. If the visceral and parietal pleura adjacent to the empyema cavity are not fixed by the inflammatory process, an open pneumothorax will result, which has a high mortality (3).

In the case presented by us, the age of the process was big (approx. 20 months), the lung being fixed to the thoracic wall, with the occurrence of calcareous placards.

The presence of an intense calcareous pahypeuritis (with variable thicknesses of up to 5 mm) represented a supplementary difficulty element in performing the intervention, but, still, the orifice created allowed us the quasi-total removal of the placards.

We consider the insistence to decollate these placards to be the key of a successful epithelization of the remaining cavity.

Although in our case there was no bronchopleural fistula, its presence would not have been a contraindication for the procedure, but, on the contrary, it would have been a supplementary indication because the sterilization of the cavity also leads to the closure of the fistula.

Closing the Eloesser window is a decision that can be taken into consideration after an interval of a few months postoperative, having options that vary from maintaining it for the entire patient’s lifetime to closing it by different methods (muscle transpositions, sealed suture after the introduction of antibiotics solution – the Clagett procedure, or the simple tegumentary suture) depending on the local conditions and not lastly on the patient’s choice (1, 5, 7).

References