

Pericardial and Diaphragmatic Graft Infection Treated by Eloesser Flap After Extrapleural Pneumonectomy: Case Report

Ekstraplevral Pnömonektomi Sonrası Eloesser Flebi ile Tedavi Edilen Perikard ve Diyafragma Graft Enfeksiyonu

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ABSTRACT Replacement of pericardium and diaphragm by artificial grafts is common practice after extrapleural pneumonectomy. In cases of infection developed in pleural space, due to the infection in artificial grafts, treatment is extremely difficult. Conservative methods should be taken into consideration in patients with malignant pleural mesothelioma who have limited life expectancy in late periods postoperatively. The treatment options for resistant empyema in the late period with synthetic grafts in the cases involved is insufficient in the literature. Basic principle is to remove the synthetic graft become infected. Here, we report a case who was treated by an Eloesser flap method instead of removal of infected pericardial and diaphragmatic grafts.

Key Words: Mesothelioma; empyema, pleural

ÖZET Ekstraplevral pnömonektomi sonrası perikard ve diyafragmanın suni greftler ile replasmanı sık kullanılan bir yöntemdir. Pnömonektomi boşluğunda enfeksiyon gelişmesi durumunda sentetik greftler de enfekte olacağından bu durumun tedavisi çok zordur. Malign plevral mezotelyomalı (MPM) hastalarda postoperatif dönemde yaşam beklentisinin kısa olmasından dolayı konservatif yöntemler göz önüne alınmalıdır. Geç dönemde sentetik greftle birlikteki bu olgularda dirençli ampiyeme yönelik tedavi seçenekleri literatürde yetersizdir. Temel ilke, enfekte sentetik greftin çıkarılmasıdır. Burada, enfekte perikardial ve diyafragmatik greftlerin çıkarılması yerine Eloesser flep uygulaması ile tedavi edilen bir olgu sunulmaktadır.

Anahtar Kelimeler: Mezotelyoma; ampiyem, plevral

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Replacement with artificial graft of diaphragm and pericard in extrapleural pneumonectomy (EPP) performed for malignant pleural mesothelioma (MPM) is commonly used.¹ When empyema occurs in the patients, the graft infection can not be treated with antibiotics since vascularization is not possible in the grafts. Since adhesion to adjacent organs of the grafts can be observed, removal of them carries a high-risk. In addition the patients with MPM have a shorter life expectancy. We present a case treated with Eloesser flap (EF) rather than removing of the grafts.

CASE REPORT

A 53-year-old man complaining of weight loss and night sweating was admitted to the hospital in October, 2009. He has asbestos exposure in his history. Physical examination revealed decreased breath sounds throughout

the left lung. A large left sided pleural effusion was seen on chest X-ray. A chest tomography showed an effusion in the left lung. The pleural effusion could not have a diagnosis of the underlying etiology. Positron emission tomography image shows increased uptake in left pleura (Figure 1). Written informed consent was taken by the patient. Pleural biopsy performed using video-assisted thoracoscopic surgery in October 2009. The patient was diagnosed with MPM, epithelioid type, and underwent an EPP. The diaphragm was reconstructed from two pieces of 2 mm thick polytetrafluoroethylene sheet and the pericardial patch was fashioned from 0.1 polypropylene mesh. The postoperative course was uneventful and it was stage III disease (T3N0M0).

The patient was admitted complaining of fever in October 2010. The patient was diagnosed as empyema with thoracentesis after mixed flora was reported. Bronchopleural fistula was not observed at bronchoscopic examination. Modified Clagett procedure was carried out with a pezzet catheter put through second midclavicular line. 1000 cc %0.9 NaCl was used for irrigation. After 15 days, there was no bacterial growth in the following cultures. However empyema persists on five months follow-up of the patient.

In March 2010 the patient had Modified Eloesser flap (MEF) procedure. The incision was given a reverse "U" shape including the cutaneous and subcutaneous tissue to cover the empyema cavity. Three ribs were partially removed under the incision line. The soft tissue on the abscess cavity was resected. Skin edges were sutured to the surrounding soft tissue after flipping it inwards and a sterile covering was formed.

Eleven months after the surgery the patient returned to his social life with the hemithorax cavity shrunk and the need for dressing the wound decreased to every other day (Figures 2, 3).

DISCUSSION

Basic principle is to remove the synthetic graft become infected. However it is known that pericardial and diaphragmatic patches cause adhesions to

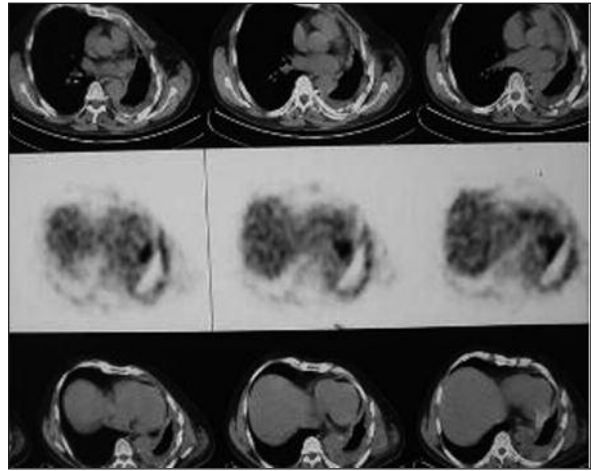


FIGURE 1: Preoperatively the fused positron emission tomography/computed tomography (PET-CT) images show a radio-tracer uptake of the left mediastinal and parietal pleura (SUV-max 9.0).

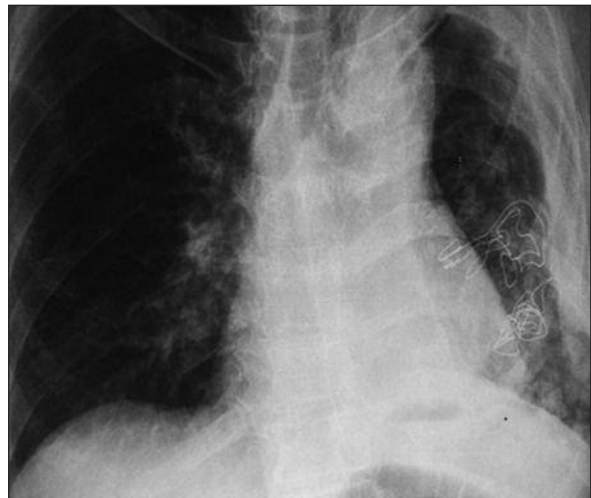


FIGURE 2: PA chest rontgenogram on the 1st postoperative day after MEF. Radiopaque lining due to the compresses in the left hemithorax is seen.

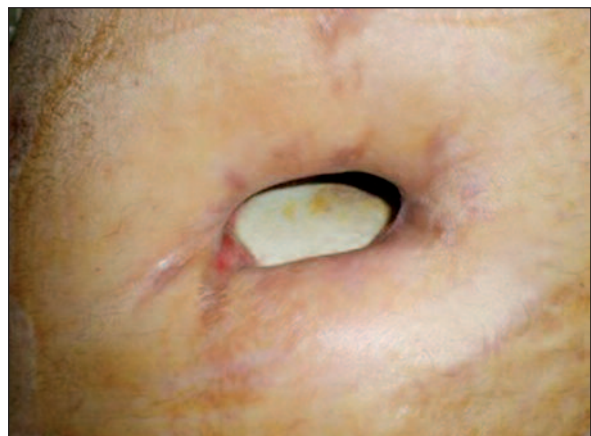


FIGURE 3: Pus through the cavity can be seen on the diaphragma graft. (See color figure at <http://www.turkiyeklinikleri.com/journal/akciger-arsivi/1309-0119/>)

the surrounding tissue in the long-term period and it is obvious that removing these grafts have risks. Conservative methods should be taken into consideration in patients with MPM who have limited life expectancy in late periods postoperatively. Sugarbaker et al. reported that thoracoscopic cleaning and irrigation treatment is successful in three out of four patients who did not have bronchopleural fistula.² However, they reported that the use of Clagett procedure and then removing the graft should be done to prevent shifting in two patients with bronchopleural fistula in late periods. The treatment options for resistant empyema in the late period with synthetic grafts involved is insufficient in the literature.

In 1963, Clagett and Geraci described a technique for postpneumonectomy empyema based on surgical principles of abscess treatment.³ It is a two staged procedure allowing secondary pleural obliteration with open pleural drainage, closure of the bronchopleural fistula, debridement of necrotic tissue and use of solutions with antibiotics.⁴ Long hospitalization period, changing of wound dress ever so often, the need for surgical operation and morbidity are the disadvantages. Also this technique is used in different populations with limited patients and with no standard approach.⁵ Defect does not close in 33% of the patients.⁶ In our patient there was postpneumonectomy empyema developed in late period with no confirmed bronchopleural fistula, therefore we used modified Clagett procedure first. However, empyema in the patient did not regress.

Thoruni et al. used EF in patients with empyema that did not respond to the other methods.⁶ It is emphasized that MEF procedure is a secure and effective way in chronic empyema patients. Eloesser Flap should be taken into consideration in empyema patients who can not tolerate major surgery, empyema with general

condition worsening and progressed multilocular empyema.⁷ Having no need for extra tube or a surgery to remove the graft after extrapleural pneumonectomy; being permanent, one phased and usable in patients with worsened general conditions are the advantages of EF. The presence of permanent epithelialized stoma, easy irrigation, no need for tube thoracostomy, cavity sterilization, helping to obliterate in time are also some advantages of this method.

Weissberg pointed out that cavity shrinks six months after EF.⁸ Shapiro et al. reported that radiographical abnormalities persist for years despite cavity closure.⁹ Bringing skin closer to pleura by collapsing the chest wall inwards and the presence of only granulation tissue between are the reasons for this. This situation may mimic a lung cavity or a bulla due to the radiolucent image on the area where no soft tissue is present. However the reflection of a crescent shaped "U" incision on the chest X-ray and the loss of segmental rib are distinctive characteristics.

The closure of the window depends on general condition of the patient as well as the presence of a bronchopleural fistula.¹⁰ Miller et al. suggest three months for benign pathologies and a year for malignant ones.¹¹

In our experience we observed that with Eloesser flap, in patients who underwent extrapleural pneumonectomy and have multilocular empyema with worsened general condition; it is possible to treat without removal of the graft. Despite the fact that the best way for treatment is the removal of the graft in patients who develop empyema after extrapleural pneumonectomy with an infected sythetic graft; in diaphragmatic and pericardial grafts Eloesser flap procedure which can be done in one seance is more appropriate because of the high risk of removing it.

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