Case report - Valves

Simultaneous mitral valve and lung surgery for complicated endocarditis

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Abstract

A 48-year-old man developed severe sepsis after a chest trauma. The patient suffered from presternal and cervical abscesses, mediastinitis, septic arthritis of the right shoulder, abscesses in the right lung lower lobe and severe infective endocarditis of the mitral valve. After subcutaneous and mediastinal abscess–drainage, hemodynamic stabilization, and control of sepsis, biological mitral valve replacement and concomitant resection of the right lower lobe were performed. Restoration of the shoulder could be performed 22 days after. The patient was discharged after 4 weeks and is well 1 year after surgery.

Keywords: Endocarditis; Sepsis; Cardiac surgery

1. Introduction

Simultaneous diseases of heart and lung requiring surgical treatment are uncommon. If they occur, they represent a dilemma for the cardiothoracic surgeon [1]. The reason for simultaneous cardio-pulmonary surgery is mostly a combination of lung carcinoma and coronary artery disease (CAD) [1–3]. Valve surgery with concomitant lung resection is described rarely. Simultaneous valve surgery and lung resection for complicated endocarditis is not reported so far.

2. Clinical summary

After a blunt chest trauma, a 48-year-old man developed severe sepsis due to infected multiple hematomas. Two weeks later the patient was admitted from his primary care hospital with presternal, cervical, and shoulder abscesses and mediastinitis. Ulcerative colitis treated with steroids was an important comorbidity.

After admission to our center’s trauma-ICU the patient was presented to the general-surgeons for mediastinitis and a big abscess in the left sternoclavicular region. The abscess was opened and treated by negative pressure wound therapy, using the vacuum assisted closure system (V.A.C.*, KCI–Austria).

Afterwards the patient was presented for cardiac-surgical evaluation, since severe endocarditis had been found on routine echocardiography. Other septic manifestations were an abscess of the right shoulder and severe abscess forming pneumonia of the right lung lower lobe. Transesophageal echocardiography (TEE) showed a large (2.7 cm), highly mobile vegetation of the anterior mitral valve leaflet (AML) and a small leaflet perforation with low-grade mitral insufficiency. CT-scan revealed severe pneumonia with pulmonary abscesses (Fig. 1). Magnetic resonance imaging showed an abscess in the head of the humerus. Blood cultures grew Staphylococcus aureus. Urgent surgery would have been required to prevent cerebral embolism, but severe septic shock contraindicated surgery. Initially, noradrenalin (5 µg/kg/h) was needed for hemodynamic stabilization.

The decision was for further antibiotic treatment and drainage of the right shoulder with irrigation. Instead of antibiotic treatment with cefuroxim and fosfomycin the inflammation parameters inclined and the patient deteriorated clinically, which mandated a switch of the antibiotic regime to vancomycin and ertapenem. The patient stabilized, and could be weaned from catecholamines and ventilation after 3 days. Twelve days after onset of antibiotic treatment, signs of sepsis reappeared and mitral regurgitation had increased to grade 4 so that decision for immediate surgery was made. Recurrence of sepsis was attributed to inflammatory alterations of the lung (Fig. 1). Complete removal of all septic manifestations including lung resection appeared mandatory for a high chance of cure.

A 15-cm right anterior 4th-interspace thoracotomy was chosen as single-approach for the combined mitral valve and lung surgery. Cardiopulmonary bypass (CBP) was installed by femoral vessel cannulation with a 28 French Bio-medicus cannula for venous drainage and a 19 French arterial Bio-medicus cannula. First, the mitral valve was
approached through the interatrial groove. The vegetations on the AML (Fig. 2) appeared solid after antibiotic treatment but extensive AML destruction precluded valve repair and bioprosthetic valve replacement with Carpentier–Edwards Thermafix prosthesis, size 29 mm, was performed. Since single lung ventilation was not tolerated, right lung lower lobectomy had to be performed on CPB.

Postoperative bleeding from pleural adhesions, but without the need of reoperation, complicated the postoperative course. The drainage volume of the chest tubes was 900 ml during the first 24 h. However, during the next days the amounts declined and a reintervention was not necessary.

On day 6 after surgery weaning from mechanical ventilation was successful and on day 9 – the patient was transferred to the ward. No further cardiopulmonary problem occurred.

The shoulder abscess was treated by synovecctomy of the supraspinatus-muscle and acromio-clavicular joint on day 22 after cardiac-surgery. On day 36 the patient was sent back to the referring hospital without any cardiopulmonary problems.

TEE two months after surgery showed no signs of recurrent endocarditis.

3. Discussion

Sepsis after blunt chest trauma is rare, but it can cause severe complications including endocarditis. This patient developed osteomyelitis, endocarditis and pulmonary abscesses. The immunosuppressive therapy for colitis-ulcerosa may have exacerbated the infection.

Risk of surgery in septic shock outweighs the risk of cerebral embolism. Under appropriate antibiotics the embolic risk decreases within a few days [4]. Due to the patient’s critical status the plan was to operate after full control of sepsis, but because of the clinical deterioration immediate surgery was necessary on day 12 of treatment. Usually, surgical procedures would have been staged, with cardiac-surgery performed first followed by the pulmonary resection [1–3]. However, an exposure to two surgical interventions has clear disadvantages: recovery from septicemia may be hampered by the remaining inflammatory focus and CPB may have immunosuppressive effects. A combined cardio-pulmonary surgery avoids these shortcomings.

We decided to replace the mitral valve first followed by the lobectomy to avoid contamination of the heart chambers with infective material.

Treatment of pulmonary abscesses primarily is medical not surgical [4]. In this case, many measures had to be taken to prevent reinfection of the mitral valve prosthesis from the lung abscesses. Antero-lateral thoracotomy avoided sternotomy which was important because of the septic manifestation in the presternal region.

This case demonstrates that simultaneous cardio-pulmonary surgery for endocarditis may be indicated to prevent further septic complications and can be performed with excellent outcome.

References


