Acta Chirurg 2011; 8: 31-35

SURGICAL TREATMENT OF MITRAL VALVE PARAVALVULAR ABSCESS IN A PATIENT UNDERGOING CHRONIC HAEMODIALYSIS – CASE REPORT AND REVIEW OF LITERATURE

KIRURŠKO LIJEČENJE PARAVALVULARNOG APSCESA U BOLESNIKA NA HEMODIJALIZI – PRIKAZ SLUČAJA I PREGLED LITERATURE

Running head: Paravalvular Abscess of Mitral Valve

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Abstract

Introduction:

Infective endocarditis is more common in patients on chronic haemodyalisis than in the general population and constitutes the second most common cause of death in this group.

Mitral valve paravalvular abscess is a serious complication of infective endocarditis which predicts future complications.

Case report:

A 53-year-old female patient was admitted in our institution for surgical treatment of mitral insufficiency and coexisting formation in the left atrium with a great risk of embolization. The patient had been treated by haemodialysis for end-stage renal disease due to diabetic nephropathy. TEE revealed a callosity located near the posterior mitral cusp, with a cavity in its centre. Surgical exploration revealed the existence of an abscess cavity filled with purulent content, encapsulated, restrained from the surrounding tissue in the posterior part of the mitral anulus. Aggressive debridement of the abscess cavity and involved tissue was performed. After that, a mitral biological prosthesis was implanted. Enterobacter spp. was isolated from the operative specimens.

Annular defect after debridement can be reconstructed by a pericardial patch (fresh autologous pericardium, glutaraldehyde fixed pericardium or Dacron fabric) or the tissue of the left atrial appendage.

Conclusion:

The presence of a paravalvular abscess as a complication of IE significantly increases the complexity of surgical treatment and leads to increased mortality. The basic principle of surgical treatment of mitral valve paravalvular abscess is

aggressive debridement and resection of the infected tissue.

Sažetak

Cilj:

Infektivni endokarditis (IE) mnogo je češći u bolesnika na kroničnoj hemodijalizi nego u općoj populaciji i drugi je najčešći uzrok smrti u ovoj skupini. Paravalvularni apsces mitralnog zaliska ozbiljna je komplikacija infektivnog endokarditisa koja predskazuje buduće komplikacije.

Prikaz slučaja:

Žena u dobi od 53 godine primljena je u našu ustanovu radi kirurškog liječenja mitralne insuficijencije i postojeće tvorbe u lijevom atriju s velikim rizikom od embolizacije. Bolesnica je liječena hemodijalizom zbog terminalne bubrežne insuficijencije uzrokovane dijabetičkom nefropatijom. Transezogealnom ehokardiografijom utvrdilo se zadebljanje blizu posteriornog mitralnog kuspisa sa šupljinom u središtu.

Kirurškom eksploracijom utvrdilo se postojanje apscesne šupljine ispunjene purulentnim sadržajem, inkapsulirane, ograničene od okolnog tkiva u stražnjem dijelu mitralnog anulusa. Učinjen je opsežni debridman apscesne šupljine i zahvaćenog tkiva. Nakon debridmana ugradila se biološka mitralna proteza. Iz intraoperativnih uzoraka izoliran je Enterobacter spp. Anularni defekt nakon debridmana može biti rekonstruiran perikardijalnom zakrpom (svježi autologni perikard, u glutaraldehidu fiksiran perikard ili Dacron) ili tkivom apendiksa lijevog atrija.

Zaključak:

Prisutnost paravalvularnog apscesa kao komplikacije IE značajno povećava kompleksnost kirurškog liječenja i doprinosi povećanom mortalitetu. Osnovni princip kirurškog liječenja je agresivni debridman i resekcija tkiva zahvaćenog infekcijom.

Introduction

The number of patients undergoing chronic dialysis is significantly increasing every year. Infective endocarditis is more common in these patients than in the general population and constitutes the second most common cause of death in this group.

Perivalvular spreading of infection leads to local complications, including paravalvular abscess. Paravalvular abscess is a serious complication of infective endocarditis that predicts a higher mortality rate, more frequent development of congestive heart failure and higher frequency of following surgical treatment.

We present a case of an intraoperatively established paravalvular abscess in a chronically haemodialysed patient.

Case Report

A 53-year-old female patient was admitted in our institution for surgical treatment of mitral insufficiency and coexisting formation in the left atrium with a great risk of embolization. The patient had been treated by haemodialysis for three previous years, three times per week, for end-stage renal disease due to diabetic nephropathy. Her relevant medical history included arterial hypertension, diabetes mellitus and hypothyroidism.

Transesophageal echocardiography (TEE) revealed a callosity, size 3 x 1 cm, located near the posterior mitral cusp, with a cavity in its centre. On the atrial side of this formation was a floating structure 1.4 cm in length and several milimeters in width. A moderate mitral insufficiency because of the posterior mitral cusp prolapse was also revealed. Coronary angiography was also performed and revealed significant stenosis of proxymal and medium segments of the right coronary artery. Sinus rhythm was on ECG. During the patient's stay in our institution her body temperature was normal.

During the surgery, the approach was median sternotomy and cardiopulmonary bypass was used. Myocardial protection was achieved with the use of anterograde and retrograde cold blood cardioplegia. Mitral valve was exposed through left atriotomy. Surgical exploration revealed the existence of the abscess cavity filled with purulent content, encapsulated and restrained from surrounding tissue (Figure 1.).

Specimens for microbiological analysis were taken. Aggressive debridement of abscess cavity and involved tissue was performed. The anterior and a part of the posterior mitral cusp were

excised. After debridement, mitral biological prosthesis (Medtronic Mosaic 29 mm) was implanted. Coronary artery bypass grafting was also performed (right coronary artery with saphenous vein graft). Because of intraoperative findings, antimicrobial therapy with vankomycin was started immediately in the ICU. Her ICU stay was 5 days. Enterobacter spp. was isolated from the operative specimens. Because of that, meropenem was also introduced in antimicrobial therapy. Antimicrobial therapy was continued for 6 weeks following surgery. The patient had an uneventful postoperative course.

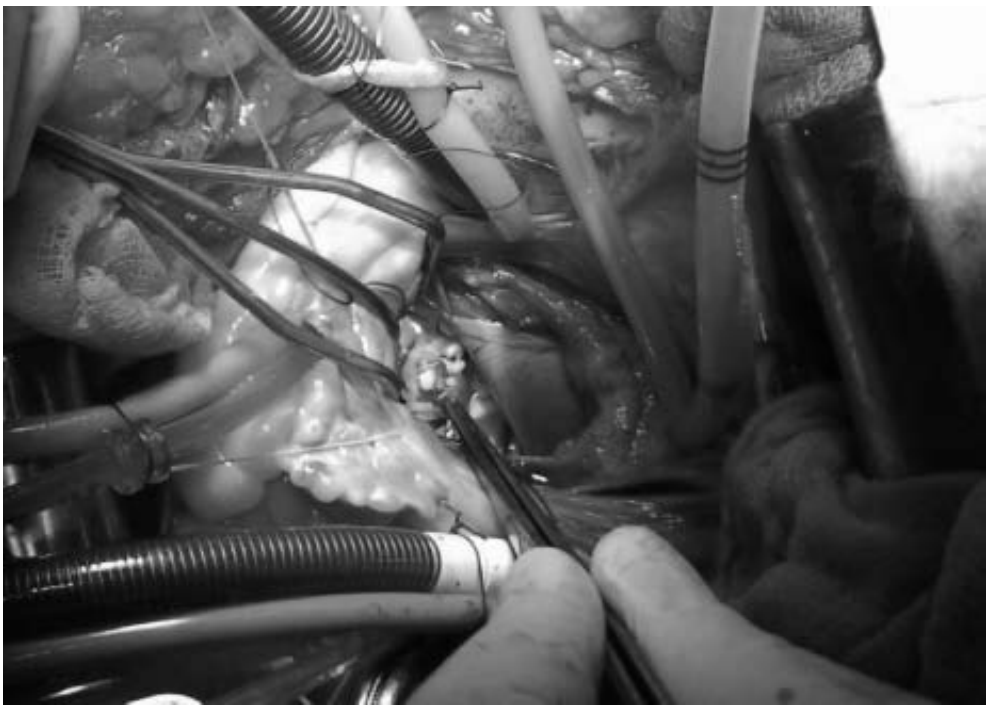

Figure 1. Abscess cavity in the posterior part of anulus of mitral valve

Discussion

Infective endocarditis (IE) is an infection of the endocardial surface of the heart. Despite improvements in diagnosing and treating IE, the mortality rate has been stable for the past several decades at 20%. Perivalvular spreading of infective endocarditis leads to perivalvular complications (abscess, fistula, pseudoaneurysm). Annular and periannular abscesses are more common on the aortic valve in the general population (52%) than on the mitral valve (14%). The posteroinferior part of the valve and the intervalvular fibrous body are most commonly affected.

The number of patients on chronic haemodialysis due to end-stage renal failure is significantly increasing every year. They have up to 17 times higher incidence of infective endocarditis than the general population. Possible causes are higher incidence of degenerative heart disease, accelerated development of valvular calcifications due to calcium metabolism dysfunctions, more frequent episodes of bacteraemia and disorders of the immunological system. The mitral valve is most commonly affected (up to 50%), usually with Staphylococcus aureus (up to 80%). In our case, Enterobacter spp. was isolated from operative specimens. Enterobacter spp. belongs to the group of Gramm negative bacteria that cause 10% of cases of IE in this group of patients.

There are several difficulties in diagnosing IE in chronically haemodialysed patients: limited acceptability of DUKE criteria (the vascular access as a potential source of bacteraemia; less common fever due to impaired immune system). TEE should be performed in every HD patient suspected of IE, in order to diagnose the disease in a timely manner and to prevent the development of possible complications. TEE demonstrates poorer efficacy in diagnosing small abscesses, especially when annular calcifications are coexistent, which is more often the case in HD patients. Because of high propensity for tissue calcium deposition, in group of HD patients, in differential diagnosis of mitral paravalvular abscesses mitral annulus calcification (MAC) must be considered, or its rare variant caseous calcification of mitral annulus (CCMA). The incidence of CCMA is about 0.63% of all MAC cases. CCMA is usually located on the posterior mitral leaflet and carries a benign prognosis. However, it can be a predisposing factor for infective endocardits, therefore, patients with this diagnosis require careful follow-up.

The presence of paravalvular abscess as a complication of IE significantly increases the complexity of surgical treatment and leads to increased mortality. The basic principle of surgical treatment of mitral valve paravalvular abscess is aggressive debridement and resection of the infected tissue. Annular defect after debridement can be reconstructed by a pericardial patch. A fresh autologous pericardium is better for annular reconstruction that is subtended by the cardiac muscle. Glutaraldehyde fixed pericardium or Dacron fabric are better for intervalvular fibrous body reconstruction. The use of biological glue can lead to improved outcomes of reconstructive procedures. The tissue of the left atrial appendage can also be used in the reconstruction of the mitral annulus. In our case, debridement of the abscess cavity was performed, and the defect did not require pericardial or other reconstruction. After debridement, the mitral valve was replaced by a biological mitral valve prosthesis.

The choice of replacement valve in HD patients depends on the life expectancy and on concomitant diseases. In younger, healthier HD patients, mechanical valves should be used. In senior HD patients with lower life expectancy, biological valves should be used. The need for anticoagulation therapy and the increased risk of hemorrhage render mechanical valves less desirable in this group of patients.

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