Major dehiscence of a mechanical prosthetic aortic valve due to massive infective endocarditis: a case report

Mekanik prostetik aort kapağının masif infektif endokardit nedeniyle majör dehissensi: Olgu sunumu

Kerem Yay, Sertan Özyalçın, Adem İlkay Diken, Tulga Ulus, Kerem Vural

Department of Cardiovascular Surgery, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara

Extensive dehiscence of mechanical prosthetic aortic valve caused by infective endocarditis has a very morbid and mortal course. Postoperative mortality is around 20-30% and several hazardous complications such as hemorrhage, cerebral emboli and sepsis may be observed during postoperative period. Urgent surgical and medical treatments must be in collaboration to get a better result. A forty-seven-year-old female patient who had a major dehiscence of a mechanical prosthetic aortic valve due to massive infective endocarditis was operated under emergency conditions due to hemodynamic instability and deterioration.

Key words: Dehiscence; infective endocarditis; prosthetic aortic valve.

İnfektif endokardit nedeniyle meydana gelen mekanik prostetik aort kapağı majör dehissensi oldukça morbid ve mortal bir seyre sahiptir. Ameliyat sonrası mortalite %20-30 civarındadır ve ameliyat sonrası dönemde hemoraji, serebral emboli ve sepsis gibi çeşitli tehlikeli komplikasyonlar gözlenebilir. Acil cerrahi ve medikal tedaviler daha iyi bir sonuç elde edebilmek için iletişim içinde olmalıdır.Masif infektif endokardite bağlı majör mekanik prostetik aort kapağı dehissensi olan 47 yaşındaki kadın hasta hemodinamik instabilite ve bozulma nedeniyle acil şartlarda ameliyat edilmiştir.

Anahtar sözcükler: Dehissens; infektif endokardit; prostetik aort kapağı.

Extensive dehiscence of a mechanical prosthetic aortic valve can cause many important clinical problems, morbidity and mortality. The major reason for dehiscence is generally infective endocarditis, which can cause clinical symptoms of fever, heart murmur, splenomegaly, embolic manifestations, and bacteremia or fungemia. Early diagnosis and combined treatment (antibiotics combined with or without surgery) are life saving and also reduce such major complications as embolic events, heart failure and septic shock. Patients with prosthetic aortic valves may have an incidence of infective endocarditis of 0.2 to 1.4 attacks per 100 patient-years, which is related to the type of aortic valve.[1,2] *Staphylococcus epidermidis*, *Staphylococcus aureus*, and *Enterococcus faecalis* are common microorganisms responsible for early prosthetic valve endocarditis and this condition is mostly related to time of implantation and perioperative bacteremia.[3-5] In a small proportion of cases of aortic valve endocarditis, no microorganism can be cultured from either the blood or surgical specimens.[3-5] The mainstays of diagnosis are a carefully taken clinical history (fever, malaise etc.) and examination (aortic valve murmur, splenomegaly, clubbing of the fingers, petechiae, splinter hemorrhages, osler node etc.). Doppler echocardiography, transesophageal echocardiography, computed tomography, cineflouroscopic prosedures are also so very helpful to detect dehiscence and vegetations. Heart catheterization and coronary angiography increase the risk of embolization in patients with aortic valve vegetations and in these patients, heart catheterization and coronary angiography should be avoided.

CASE REPORT

A forty-seven-year-old female who had a history of mechanical aorta valve replacement 15 years ago was admitted to the emergency department of our hospital with complaints of low grade fever and chills. She had diabetes mellitus and hypertension as co-morbid diseases. On physical examination she had a fourth degree diastolic murmur at the aortic focus, pulmonary bibasal crepitant rales and tachycardia (130 heart beats/minute) without any other pathologic findings like hepatosplenomegaly or

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Correspondence: Adem İlkay Diken, M.D. Türkiye Yüksek İhtisas Eğitim ve Araştırma Hastanesi, Kalp ve Damar Cerrahisi Kliniği, 06100 Sıhhıye, Ankara, Turkey. Tel: +90 312 - 319 77 04 e-mail: ademilkay@gmail.com

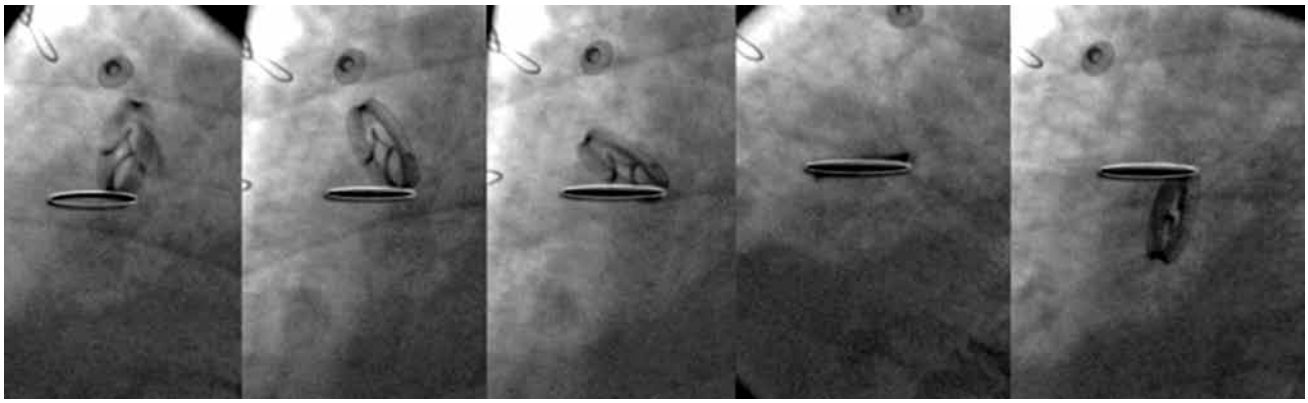

Fig. 1. Flouroscopic view of dehischensed aortic prosthetic valve (Circular halogram represents native aortic annulus).

pretibial edema. Electrocardiography showed that normal sinus tachycardia with ST depression at V4-6 derivations. Transthoracic echocardiography findings were mechanical aortic dehiscence, suspicious vegetations and abscess formations and grade 2-3 aortic regurgitation. Fluoroscopy showed extensive dehiscence of the mechanical prosthetic aortic (Fig. 1) valve displaced from the outflow track of the left ventricular chamber to the aorta, with normal leaflet movement (Fig. 2). Under this emergent condition the patient was urgently taken to surgery.

Operative procedure

Bilateral common femoral arteries were explored for femoral arterial cannulation but due to insufficient size of the femoral arteries, arterial cannulation was planned through the ascending aorta and a median resternotomy was achieved by oscillating saw. After dissection of massive pericardial adhesions, routine aortic arterial, two-staged venous and aortic vent cannulations were performed. Systemic cooling down was 29 ºC. Aortotomy was done and by using selective coronary ostial cannula a small amount of crystalloid cardioplegia was also administrated to myocardium for better myocardial protection. Only two sutures were holding the mechanic aortic valve and massive infection was found around the valve. The old valve (23 size Medtronic-Hall (MH) monoleaflet valve) was dissected out and infectious materials were cleaned up. Following these steps, aortic mechanical valve replacement was performed with 25 size St. Jude aortic mechanical valve using one-by-one suture technique with valve sutures at the non-coronary cusp passed through from the Teflon-coated patch-supported adventitial side of the aorta to the endothelial side. Aortotomy was sutured, systemic heating up started and weaning from cardiopulmonary bypass by infusion rate of dopamine 10 μg/kg/min and dobutamine 10 μg/kg/min. After decannulation and haemostasis, the patient was transferred to the intensive care unit (ICU).

Postoperative period

The patient started to wake in the postoperative 2nd hour and was extubated at the 6th hour. Antibiotic

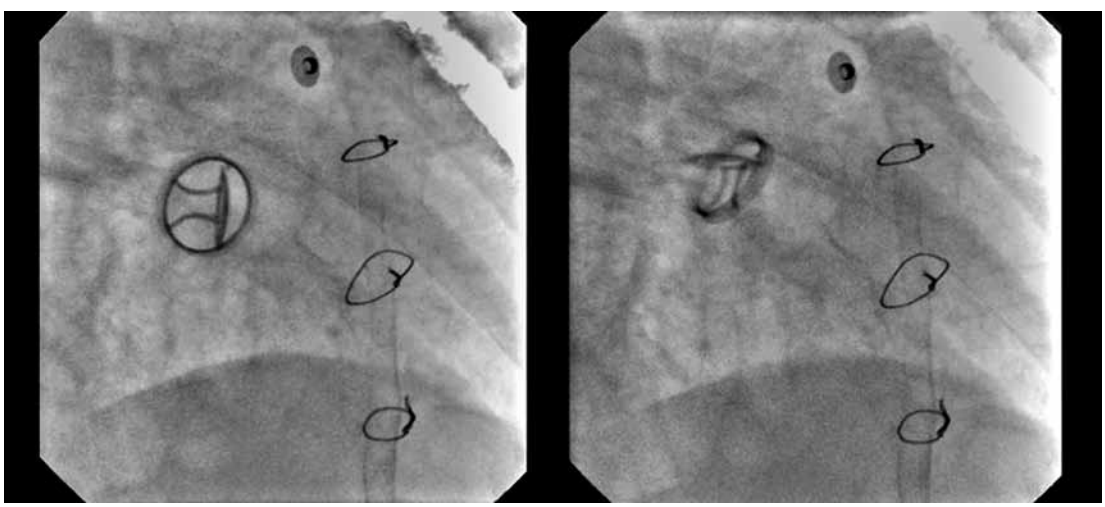

Fig. 2. Mono-leaflet mechanical valve leaflet is working at flouroscopy.

therapy for infectious endocarditis was a combination of vancomycin, meropenem, gentamycin and rifampicin. During ICU follow-up hemodynamic parameters remained stable and normal so the patient was discharged to the ward from ICU with infusion of dopamine 7.5 μg/kg/min on the second day after operation. To complete antibiotic treatment against infective endocarditis the patient was followed up to 40 days after operation during which time no other complication developed. During this period no specific microorganism could be isolated, cultured or demonstrated from surgical materials or blood culture. The last echocardiography revealed that new vegetative materials formed on the prosthetic valve. On the 55th postoperative day, the patient died because of ischemic emboli which were most probably septic in origin.

DISCUSSION

Mechanic prosthetic valve dehiscence because of infective endocarditis needs early detection and urgent treatment which can be provided by antibiotics combined with or without surgery. If the dehiscence is so massive like our case, early intervention is useful for providing washout of infective materials before developing hemodynamic instability and should be combined with effective multi-choice antibiotics until the specific microorganism can be cultured and demonstrated from the surgical materials or blood culture.[6] In a small number of cases of prosthetic valve endocarditis including ours, no microorganism can be cultured from either the blood or surgical specimens. In the setting of extensive infection or abscess formation, suspension of the aortic root or annulus with patches and suturing from patch to mechanical valve may strengthen the annulus and reduce further complications. We chose this technique for our case and we believe that it provided a strong attachment for the new mechanic valve. After removal of the old valve in mechanical aortic valve endocarditis, the best choice of new valve material is aortic valve homograft. However, in emergency situations such as ours, there is no time to await homografts and no evidence that bioprostheses are better than mechanical valves in patients with active infective endocarditis.[5] So if the patient is young like our case, in order to avoid repeat surgeries, the mechanical valve can be chosen. With regard preoperative diagnostic procedures, transthoracic echocardiography may not be the suitable choice. It may misdiagnose the massive dehiscence and just report the paravalvular leakage. For the early and distinct diagnosis of extensive dehiscence Doppler echocardiography, transesophageal echocardiography or computed tomography should be very helpful. Cineflouroscopy can also be demonstrative, as used in this case.

Major dehiscence of a mechanical prosthetic aortic valve due to massive infective endocarditis can result in morbidity or mortality. The literature reports higher operative mortality for prosthetic valve endocarditis ranging from 20 to 30%.[5] Early detection and collaboration between cardiovascular surgery, cardiology and infectious disease specialists is needed to get better results.

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