

Partial posterior leaflet resection for mitral valve endocarditis and valve repair with autologous pericardium

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ABSTRACT

Herein, we present a 55-year-old female who underwent a mitral valve repair procedure for mitral valve endocarditis. Multiple vegetations and leaflet tissues were surgically removed from the P1 and P2 scallops. The defect of the posterior leaflet was repaired using autologous pericardium. Rims of the pericardium supported three artificial chordae to obtain good mitral coaptation. The postoperative course was uneventful. The patient was discharged on the 30th postoperative day.

Keywords: Autologous pericardium, mitral endocarditis, valve repair.

Mitral valve endocarditis (MVE) is defined as the infection of the entirety or portion of one or both mitral valve leaflets. Age, shock, prosthetic valve endocarditis, reduced left ventricular function (ejection fraction <40%), and recurrent endocarditis are considered significant predictors of mortality. However, current evidence regarding the treatment and management strategy of MVE is not univocal and often based on personal experiences.^[1] The timing and indications for surgical intervention to prevent systemic embolism in infective endocarditis remain controversial.^[2] The rate of stroke is significantly higher during the first two weeks of antibiotic therapy and in those with left-sided infective endocarditis, particularly in the mitral position. The early involvement of an experienced cardiac surgeon is essential to determine the optimal surgical option and timing to provide the best outcome for patients with MVE. Surgical techniques are also controversial. Mitral valve repair can provide better long- and short-term survival.^[3] The feasibility of valve repair depends on the extent of tissue destruction. If only one leaflet or scallop is involved, conservative surgery is possible. Herein, we report a case of posterior mitral leaflet endocarditis located on P2 and P1 scallops.

dyspnea. *Coxiella burnetii* was yielded from repeated blood cultures. Multiple large (>10 mm) vegetations were found on the posterior mitral leaflet with moderate mitral regurgitation at transesophageal echocardiography (Figure 1a). Tetracycline 500 mg two times daily and vancomycin 2 g daily were administered. Surgical intervention was scheduled for two days later. Ascending aorta and bicaval cannulations were done. A superior septal approach was used for mitral valve exposure. Multiple large vegetations were found on the mitral P1 and P2 scallops (Figure 2a). Vegetations firmly adhered to the posterior leaflet. The P1 and P2 scallops were destructured during the removal of vegetations. Only the P3 segment of the posterior leaflet was free of endocarditis. The P1 and P2 scallops and the adhered chordae were resected. All infected tissues were removed (Figure 2b). The autologous pericardium was processed with 0.001% glutaraldehyde. Measurements were done on the debrided area, and the autologous pericardium was tailored slightly higher than those measurements. The pericardium

CASE REPORT

A 55-year-old female patient was admitted to our department with a high fever, fatigue, and

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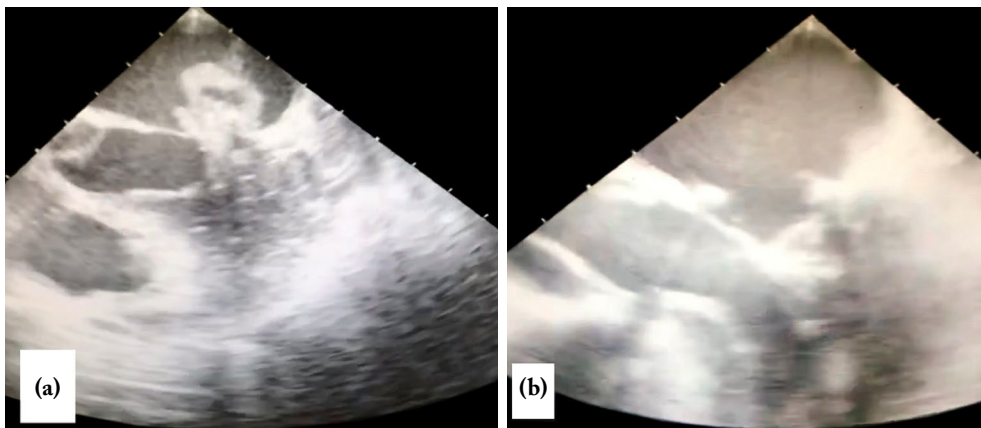


Figure 1. (a) Preoperative transesophageal echocardiography. Arrows indicate multiple large vegetations on the posterior leaflet. (b) Postoperative transesophageal echocardiography. Both mitral leaflets' movements and coaptation are good. Arrows indicate good leaflet coaptation and prosthetic ring materials.

was sutured to both the P3 scallop and the mitral annulus of the P1 and P2 scallops (Figure 3). Three artificial chordae were implanted on the sutured pericardium. Satisfactory coaptation was obtained by the saline test. A size 32 rigid ring was used for annular stabilization. The cross-clamp time and total perfusion time were 91 and 124 min, respectively. Mild degree mitral regurgitation was found at the

early postoperative transesophageal echocardiograph examination (Figure 1b, Video 1). The postoperative course was uneventful. Vancomycin administration ceased at the end of the fourth postoperative week. The patient was discharged on the 30th postoperative day. Tetracycline therapy was extended to six weeks. The general condition of the patient was good, and the functional capacity was class I.

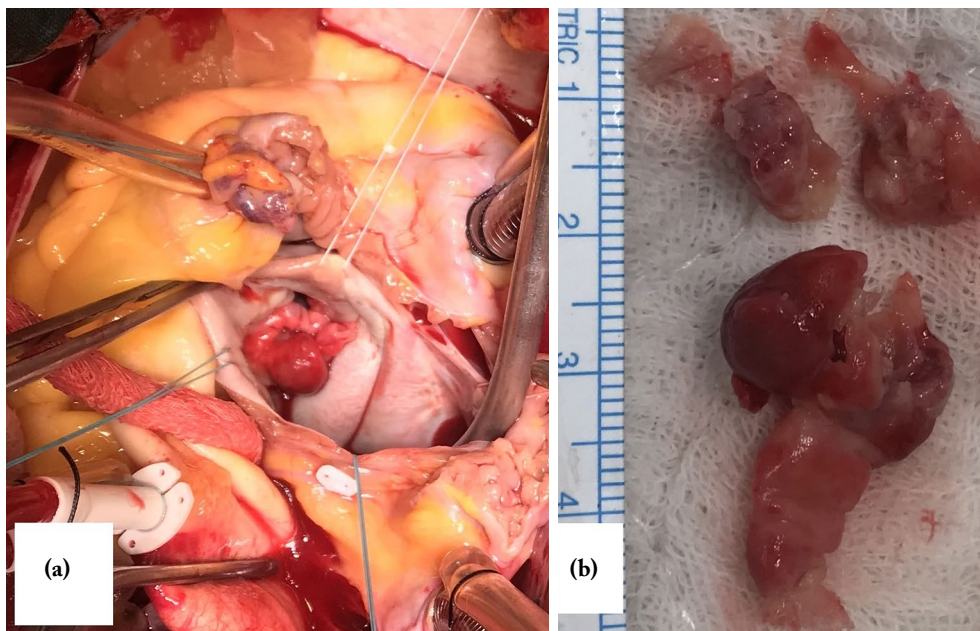


Figure 2. (a) Intraoperative view of the large vegetations located on the posterior mitral leaflet. (b) Intraoperative view of the multiple vegetations resected. The largest vegetation is 27×15 mm in size.

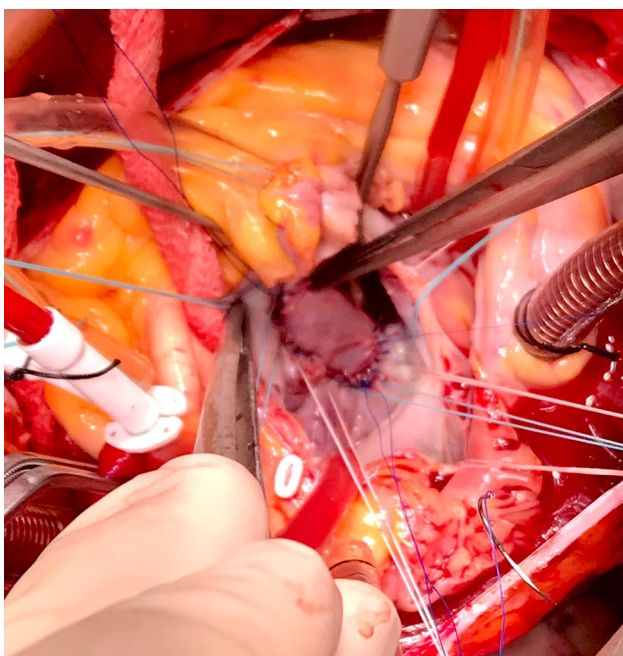
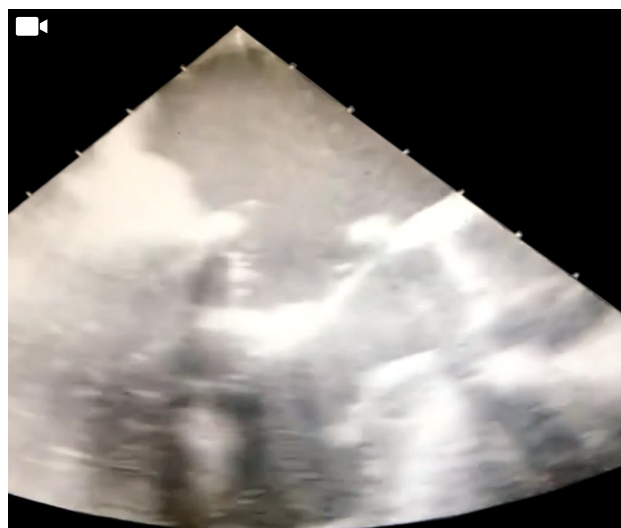


Figure 3. Intraoperative view of the resected P1 and P2 scallops and the glutaraldehyde-processed autologous pericardium sutured to repair the posterior leaflet defect.

DISCUSSION

The clinical presentation of *C. burnetii* infections (chronic Q fever) is insidious and lacks many of the typical features of subacute bacterial endocarditis. As a result, there is often a significant delay in diagnosis. Despite increasing awareness, recent studies demonstrate a mean delay of seven months from symptom onset to diagnosis. The majority of cases present with congestive heart failure due to valvular dysfunction. Unlike typical cases of endocarditis, fever is absent in a significant proportion and is frequently intermittent or low grade. Although embolic phenomena have been reported in up to one-third of cases, these are usually limited to advanced disease.^[1,4] The incidence of infective endocarditis in the general population has ranged from 16 to 62 cases per million person-years.^[4] Despite advances in diagnostic techniques and therapeutic strategies, infective endocarditis remains associated with substantial morbidity and mortality, with overall mortality rates for native and prosthetic valve endocarditis as high as 20 to 25%.^[1-3] The timing of surgery is crucial for patients with native valve endocarditis. Delaying surgery often increases both the probability of complications (stroke/systemic embolization) and



Video 1. Early postoperative transesophageal echocardiographic examination revealing sufficient movement and coaptation in both leaflets.

operative mortality. Unfortunately, most surgeons find that cardiologists or other hospitals refer patients with infective endocarditis after the failure of medical therapy, when patients are in intractable heart failure, or when patients have experienced extensive heart tissue damage. In a systematic review of the literature evaluating the morbidity and mortality of mitral valve repair compared to replacement in infective endocarditis, the repair group showed a significantly lower in-hospital mortality (2.3% *vs.* 14.4%) and a markedly better 10-year survival rate compared to the replacement group (long-term mortality, 7.8% *vs.* 40.5%).^[3] Similarly, another review of the literature demonstrated better long-term event-free survival.^[5,6] The goals of mitral valve repair are to remove the vegetation while restoring a proper line of coaptation on both leaflets to repair the leaflet if perforated and preserve the subvalvular apparatus. Excision of the vegetation can be performed along its cleavage plane on the leaflet. *En bloc* removal of the infective tissue is needed when the infection extends to the leaflet tissue. Extensive removal creates a large leaflet tissue defect. We have used glutaraldehyde-processed autologous pericardium to repair the P1 and P2 area. Three PTFE (polytetrafluorethylene) artificial chordae sutures were placed to obtain satisfactory coaptation. Nonbiological material usage is still controversial in endocarditis surgery. Nonetheless, recently published studies advocate that prosthetic materials can be used

after an adequate debridement procedure.^[6] We used a rigid prosthetic ring as we were sure that all infected tissues were completely removed.

In conclusion, the primary objective of valve endocarditis surgery is to start surgery before the development of an embolic process and remove all necrotic tissues and continue sufficient antibiotic therapy in the postoperative period.

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REFERENCES

1. Nappi F, Spadaccio C, Dreyfus J, Attias D, Acar C, Bando K. Mitral endocarditis: A new management framework. *J Thorac Cardiovasc Surg* 2018;156:1486-95.e4.
2. Kang DH, Kim YJ, Kim SH, Sun BJ, Kim DH, Yun SC, et al. Early surgery versus conventional treatment for infective endocarditis. *N Engl J Med* 2012;366:2466-73.
3. Feringa HH, Shaw LJ, Poldermans D, Hoeks S, van der Wall EE, Dion RA, et al. Mitral valve repair and replacement in endocarditis: A systematic review of literature. *Ann Thorac Surg* 2007;83:564-70.
4. Hogevis H, Olaison L, Andersson R, Lindberg J, Alestig K. Epidemiologic aspects of infective endocarditis in an urban population. A 5-year prospective study. *Medicine (Baltimore)* 1995;74:324-39.
5. Zhao D, Zhang B. Are valve repairs associated with better outcomes than replacements in patients with native active valve endocarditis? *Interact Cardiovasc Thorac Surg* 2014;19:1036-9.
6. Azboy D, Temiztürk Z. Early clinical results of surgical treatment of active infective endocarditis. *Cardiovasc Surg Int* 2022;9:27-35.