

 Mehmet Burak Gulcan¹,  Mehmet Ali Kaygin²

¹Yenimahalle Research and Training Hospital, Department of Cardiovascular Surgery, Ankara, Türkiye

²Erzurum City Hospital, Department of Cardiovascular Surgery, Erzurum, Türkiye

Received: 26 February, 2026

Accepted: 27 March, 2026

Published: 30 March, 2026

Corresponding Author: Mehmet Burak Gulcan, Yenimahalle Research and Training Hospital, Department of Cardiovascular Surgery, Ankara, Türkiye
Email: drmburakgulcan@gmail.com

CITATION

Gulcan MB, Kaygin MA. Ozaki Procedure and Mitral Valvuloplasty in a young female patient, a case report. AZJCVS. 2026;7(1):25-7.

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.



Ozaki procedure and mitral valvuloplasty in a young female patient, a case report

Abstract

Ozaki procedure is an alternative surgical technique for aortic valve repair, particularly in young patients to avoid lifelong anticoagulation. We present a 25-year-old female patient with severe aortic and mitral valve insufficiency who was admitted with progressive dyspnea. Transthoracic and transesophageal echocardiography revealed significant valvular pathology. The patient underwent successful aortic valve neocuspidization using the Ozaki technique combined with mitral valve repair and annuloplasty. The postoperative course was uneventful, and the patient was discharged on postoperative day 7 with marked clinical improvement. Thus, lifelong warfarin anticoagulation was avoided, preserving her future reproductive potential. This case demonstrates that combined valve repair may be a feasible and effective alternative to valve replacement in selected young patients.

Keywords: Heart valve prosthesis, aortic valve insufficiency, transcatheter aortic valve implantation, aortic valve stenosis

INTRODUCTION

Degenerative aortic disease, infective endocarditis, and rheumatic endocarditis are leading causes of aortic regurgitation (1). Echocardiography is the keystone diagnostic tool to detect aortic regurgitation and its underlying mechanisms (1). Echocardiography also allows assessment of valve structure to determine suitability for valve repair or valve-sparing surgical techniques (1). Computed tomography and cardiac magnetic resonance imaging are other diagnostic tools (1). Valve replacement is the common treatment for aortic regurgitation (1). Aortic valve repair and the Ross procedure are alternatives to valve replacement (1). Transcatheter aortic valve implantation (TAVI) may be considered as an alternative to standard valve replacement (2). However, this technique is recommended for patients with high surgical risk (3). Neocuspidization of the aortic valve (Ozaki procedure) is another alternative method (2). Mechanical valves require anticoagulation, whereas bioprostheses may require reoperation after 10–15 years (4). The Ozaki procedure is an appropriate alternative to the Ross

procedure (4). The Ozaki technique provides a particular alternative to standard aortic valve replacement and offers better outcomes in terms of hemodynamics, surgical morbidity, and valve durability (4). We performed the Ozaki procedure in a 25-year-old female patient with both aortic and mitral valve regurgitation. In addition, mitral valve repair was performed. We aimed to avoid lifelong anticoagulation in this patient. We aimed to present our surgical experience to contribute to the literature.

CASE REPORT

A 25-year-old female patient was admitted to the hospital with dyspnea. This symptom had started approximately one year earlier. Initially, the patient had exertional dyspnea, which progressively worsened over time. The patient was evaluated in the department of cardiology using transthoracic echocardiography (TTE). After detecting mitral and aortic insufficiency, the patient was further evaluated using transesophageal echocardiography (TEE). TEE revealed a dilated left ventricle with normal ejection fraction, severe aortic stenosis with a gradient of 43 and a Vmax of 4 m/s, and severe mitral insufficiency with Barlow's disease. Left

ventricular end-systolic diameter (LVESD) was calculated as 45 mm. The New York Heart Association class was IV. B-type natriuretic peptide (BNP) level was 1023. The patient was considered to have rheumatic aortic insufficiency and stenosis. The cardiac team decided to perform surgery according to guideline recommendations, and the Ozaki procedure was planned.

Median sternotomy was performed. The procedure was carried out under cardiopulmonary bypass. An approximately 8×8 cm piece of anterior pericardium was harvested. Left atriotomy was performed, and ring annuloplasty was applied. Simultaneously, the pericardial tissue was treated with 0.6% glutaraldehyde solution for ten minutes. Afterwards, it was rinsed with saline for 6 minutes. This procedure was repeated three times, and the autologous pericardium was prepared (Figure 1). Sizers were inserted, and cusp measurements were obtained (Figure 2). According to these measurements, the pericardium was shaped. Aortotomy was performed 1.5 cm distal to the right coronary artery. Calcified aortic valves were removed, and the shaped pericardial pieces were sutured cusp by cusp using 4-0 polypropylene sutures. A pinwheel shape was observed, and the saline test was uneventful (Figure 3). The mitral valve was then repaired using the Alfieri technique, and a 3D mitral ring was implanted. The saline test was uneventful. Intraoperative TEE evaluation demonstrated well-functioning valves without insufficiency or stenosis. Standard closure was performed.

The intensive care unit period was uneventful. The patient was discharged on postoperative day 7. The patient's New York Heart Association class improved from IV to I at discharge.

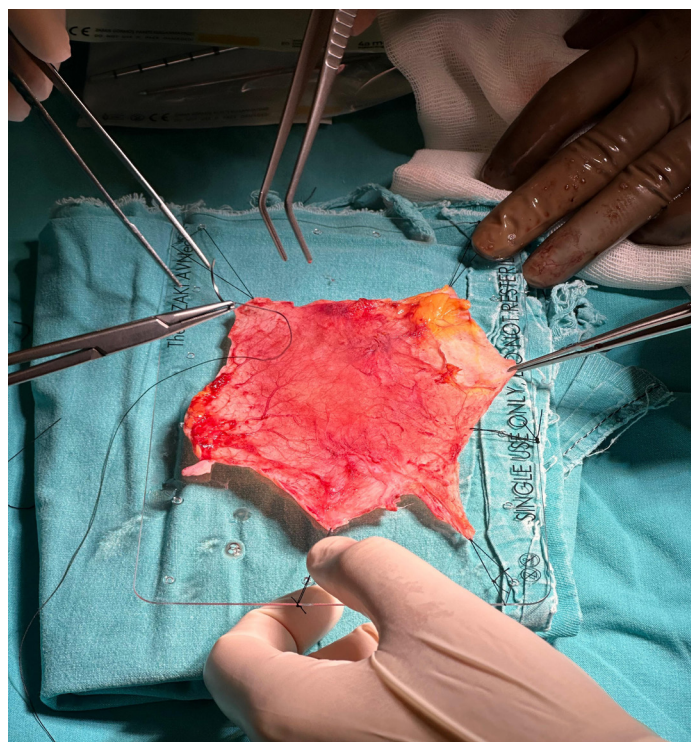


Figure 1. Figure shows glutaraldehyde treated pericardium

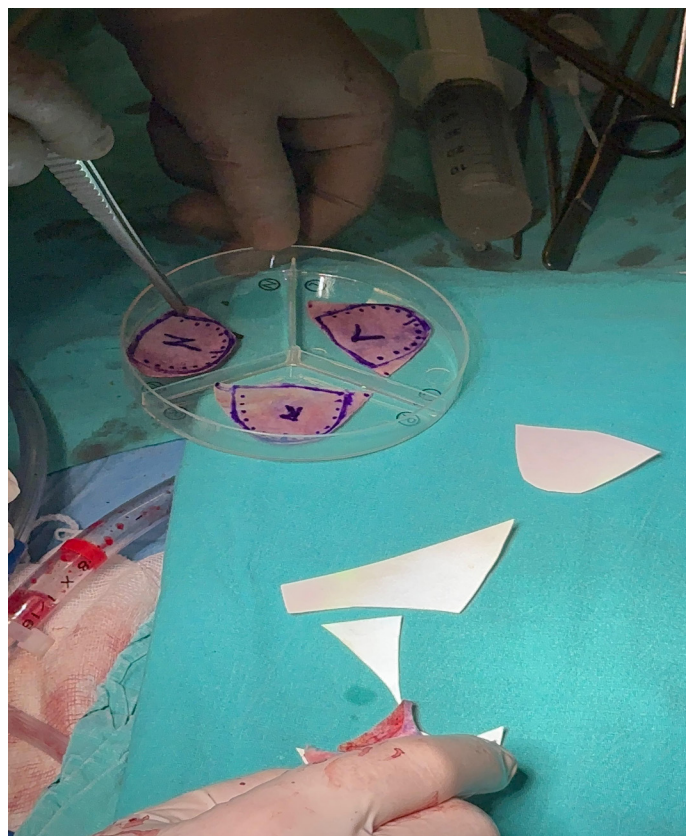


Figure 2. Figure shows shaped pericardium pieces

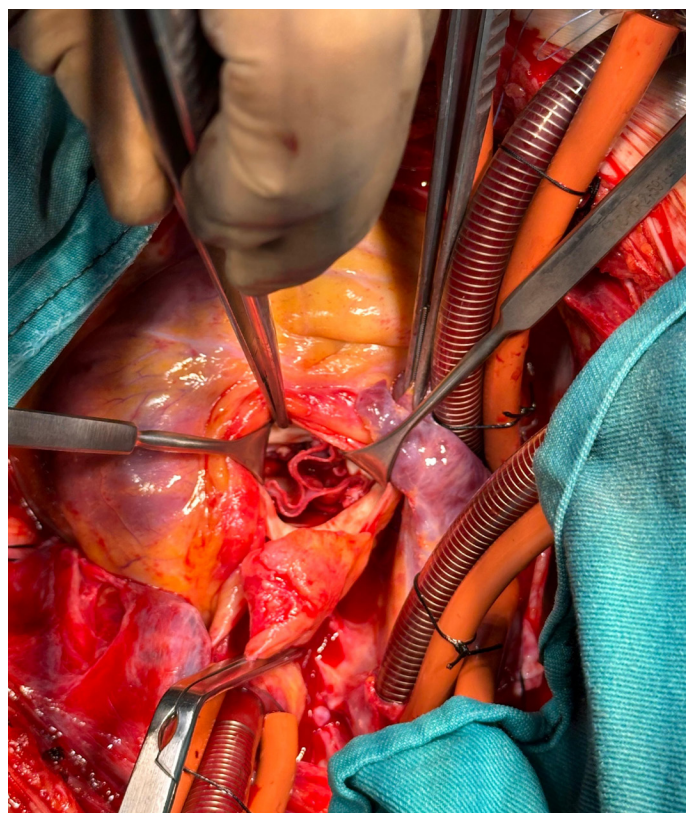


Figure 3. Figure shows completed procedure with inserted pericardial pieces

DISCUSSION

Ozaki et al. first described this surgical technique in 2011 (3). Glutaraldehyde-treated autologous pericardium is used in this method (2–6). Although all three aortic cusps are replaced, the procedure is more similar to valve repair than valve replacement (3), as native tissue is used and lifelong anticoagulation is not required. The Ozaki procedure can be applied in a wide spectrum of aortic valve diseases, including aortic stenosis, aortic regurgitation, infective endocarditis, prosthetic valve endocarditis, and annulo-aortic ectasia (3,6). Aortic valve repair may also be performed but is limited to selected cases of aortic regurgitation (3). In this technique, each cusp is prepared individually, and their sizes differ from one another (3). Glutaraldehyde-treated pericardium increases the effective height of the native aortic valve and creates a larger coaptation zone (3). This results in an expanded effective orifice area (6). In addition, glutaraldehyde treatment provides a more durable and stable structure (3). Bioprosthetic valves are another option to avoid lifelong anticoagulation; however, they are associated with complications such as calcification, cusp stiffening, and the need for reoperation (6). Ozaki et al. (5,6) suggested that independent cusp reconstruction is more effective in preserving the natural movement of the aortic annulus and its coordination with the left ventricle, sinus of Valsalva, and aorta compared to standard valve replacement. Larger coaptation zones also reduce mechanical stress on commissures and the annulus (6). However, this technique may not always provide optimal outcomes, particularly in older patients with calcified aortic stenosis (5).

Given the presence of mitral valve disease, repair should be the first-line surgical treatment (1). In our patient, mitral valve repair and annuloplasty with a 3D ring were successfully performed. Similar to the aortic procedure, this approach does not require lifelong anticoagulation. Thus, lifelong warfarin anticoagulation was avoided, preserving future reproductive potential in this young female patient.

Liakopoulos (7) also recommends double valve repair in endocarditis surgery. Although our patient did not have endocarditis, her condition is consistent with this recommendation.

CONCLUSION

The Ozaki procedure is a valuable alternative in aortic valve surgery. It may be particularly beneficial in young patients to

avoid reoperation and lifelong anticoagulation. In this case, successful combined aortic and mitral valve repair was achieved. Increasing experience with valve repair techniques may expand their use in clinical practice and improve future treatment strategies.

Conflict of Interests: The authors declare that there are no conflicts of interest.

Financial Disclosure: The authors declare that there is no financial support.

Patient Informed Consent: Written informed consent was obtained from the patient for publication of this case and accompanying images.

REFERENCES

1. Vahanian A, Beyersdorf F, Praz F, Milojevic M, Baldus S, Bauersachs J, et al. 2021 ESC/EACTS guidelines for the management of valvular heart disease. *Eur Heart J*. 2022;43:561-632.
2. Alhan C. Ozaki procedure. *Turk Gogus Kalp Damar Cerrahisi Derg*. 2019;27:451-3.
3. Ozaki S, Kawase I, Yamashita H, Uchida S, Nozawa Y, Matsuyama T, et al. Aortic valve reconstruction using self-developed aortic valve plasty system in aortic valve disease. *Interact Cardiovasc Thorac Surg*. 2011;12:550-3.
4. Badalyan SS, Markosyan SV, Ismailbaev AM, Asghar A, Ur Rehman A. Outcomes of Ozaki procedure/aortic valve neocuspidization for aortic valve diseases: a systematic review. *Anatol J Cardiol*. 2023;27:619-27.
5. Ozaki S, Kawase I, Yamashita H, Uchida S, Nozawa Y, Takatoh M, et al. A total of 404 cases of aortic valve reconstruction with glutaraldehyde-treated autologous pericardium. *J Thorac Cardiovasc Surg*. 2014;147:301-6.
6. Ozaki S, Kawase I, Yamashita H, Uchida S, Takatoh M, Kiyohara N. Midterm outcomes after aortic valve neocuspidization with glutaraldehyde-treated autologous pericardium. *J Thorac Cardiovasc Surg*. 2018;155:2379-87.
7. Liakopoulos OJ. Commentary: AVNeo (Ozaki) and transaortic mitral valve repair using autologous pericardium in aortomitral endocarditis. *JTCVS Tech*. 2020;3:108-9.