



Case Report

Successful redo aortic valve replacement using Perceval valve in a patient with prosthetic valve endocarditis complicated by acute cerebral infarction

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ABSTRACT

Introduction: and importance: For treatment of prosthetic valve endocarditis (PVE), redo-aortic valve replacement (AVR) is usually required. However, the recurrence of PVE continues to be a serious problem that needs a solution.

Case presentation: An 83-year-old woman who had undergone AVR for aortic infective endocarditis 12 years ago was diagnosed with PVE complicated with acute cerebral infarction. Urgent redo-AVR was performed. After complete removal of the prosthesis, Perceval S valve was implanted successfully. There were no postoperative neurological deteriorations, and the echocardiogram showed no recurrence of PVE.

Clinical discussion: Theoretically, the fewer prostheses left in the heart, the lower the risk of PVE recurrence.

Conclusion: In patients with PVE, redo-AVR using the Perceval valve may be a suitable option since Perceval reduces the prosthesis in the heart compared with conventional redo-AVR.

1. Introduction

Prosthetic valve endocarditis (PVE) is a life-threatening complication of aortic valve replacement (AVR) [1], and redo-AVR is essentially required for radical treatment of PVE. Recurrence of PVE is one of the serious complications after redo-AVR for PVE. Since conventional redo-AVR requires several pledget-supported sutures and the usual prosthetic valves have cuff fabric, the potential risk of PVE recurrence may be increased theoretically [2].

Sutureless AVR is an alternative surgical option created using recent advances in aortic valve device technology [3]. Compared with traditional valves, sutureless valves have the advantages of shortening the duration of the operation. Furthermore, sutureless AVR does not require any annular sutures and does not have a fabric cuff. Consequently, sutureless AVR might lead to the improvement of postoperative prognosis in PVE.

Herein, we describe a successful completion of redo-AVR using the Perceval valve for active PVE complicated with acute cerebral infarction (CI). We have reported this case following the SCARE guidelines [4].

2. Case presentation

An 83-year-old woman who had undergone AVR using a Carpentier-Edwards PERIMOUNT valve (21 mm, Edwards Lifesciences, USA) for infective endocarditis (IE) 12 years ago was admitted to our hospital for high fever. The patient continued anti-platelet medication (aspirin 100 mg/day) after AVR. Laboratory data showed elevation of acute inflammatory parameters with a substantial increase in the hepatobiliary enzyme levels. Enhanced computed tomography (CT) imaging demonstrated dilatation of the gallbladder due to the presence of a stone. Emergency endoscopic retrograde biliary drainage was performed for acute cholangitis, and meropenem (2 g/day) was administered. At next day after her admission, blood cultures were positive for methicillin-sensitive *Staphylococcus aureus*, and antibiotic therapy was changed to cefazolin (3 g/day).

After these therapies, inflammatory markers improved. However, after 8 days, an echocardiogram showed mobile vegetations (10.7 × 5.7 mm) on the prosthetic aortic valve (Fig. 1A). A slight thickening of the mitral leaflet was also noted. Brain magnetic resonance imaging revealed acute CI in the right temporal and occipital lobes (Fig. 1B).

The patient was diagnosed with PVE following acute cholangitis. A preoperative echocardiogram suggested possible endocarditis with the

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involvement of the mitral valve. The patient's frailness had been exacerbated by PVE, with a decrease in body weight to 43 kg, and hence the patient could not walk independently unaided due to disuse syndrome and PVE. One week later, we planned to perform a redo-AVR using the Perceval valve and, if needed, concurrent mitral valve plasty.

After the establishment of cardiac arrest under normothermic cardiopulmonary bypass (CPB), a high transverse aortotomy was

performed. Several vegetations were noted to be attached to the prosthetic aortic valve. After complete resection of the prosthesis, the mitral valve was exposed through left atriotomy. There were no vegetations on the leaflets. After optimizing the aortic annulus to the correct size, a rifampicin-soaked Perceval valve (size S, LivaNova, London, UK) was precisely implanted (Fig. 2). Intraoperative *trans*-oesophageal echocardiography showed no significant paravalvular leakage. The durations of

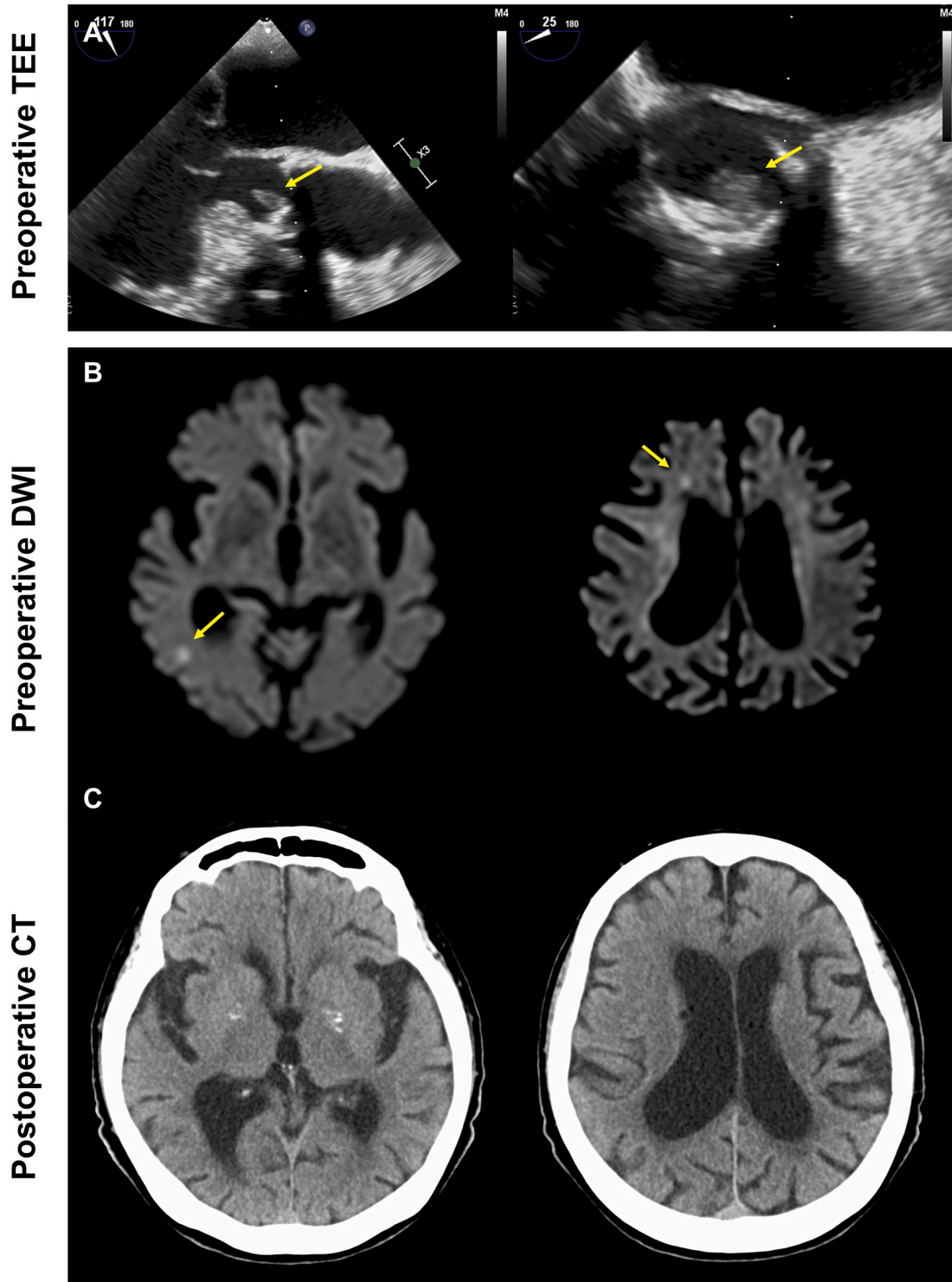


Fig. 1. Perioperative imaging findings

A. Preoperative *trans*-oesophageal echocardiography; Mobile vegetations attached on the prosthetic valve (yellow arrow). B. Preoperative diffusion-weighted imaging; High-intensity lesions in right temporal and occipital lobes (yellow arrows). C. On postoperative brain computed tomography, there were no intracranial haemorrhages. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

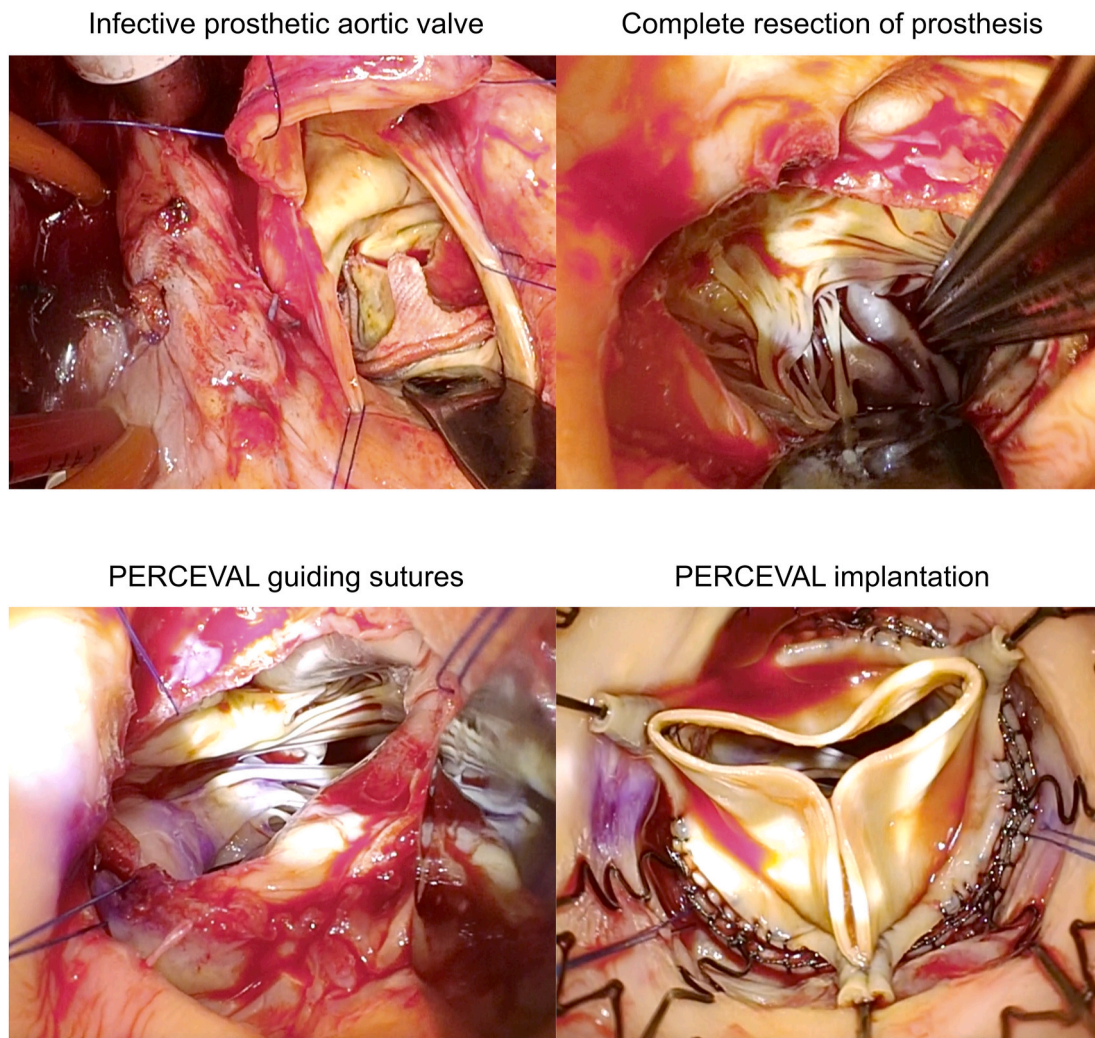


Fig. 2. Intraoperative findings

Through the aortotomy, the infected prosthetic valve with several vegetations were found. After complete removal of the prosthesis, the Perceval valve was successfully implanted by using three guiding sutures.

aortic cross-clamp and CPB were 106 and 164 min, respectively.

The postoperative course was uneventful. Regarding thrombocytopenia, the minimum platelet count was 57,000/ μ L on postoperative day 2. It improved to normal levels by postoperative day 11. On brain CT imaging, no intracranial haemorrhages were observed (Fig. 1C). Cefazolin (3 g/day) was administered for 8 weeks postoperatively. The haemodynamic parameters associated with the Perceval valve were satisfactory as follows: the aortic valve area was 1.5 cm², and the mean pressure gradient was 8 mmHg. After rehabilitation for disuse syndrome, the patient was discharged following ambulation on postoperative day 86. During the 6 months following-up, there were no recurrences of PVE in the patient.

3. Discussion

Even with transcatheter aortic valve implantation gaining popularity in managing aortic valve disease in recent years, surgical AVR continues to be an important option, particularly for PVE. PVE recurrence is a serious complication in the postoperative period following surgical management. The recurrence rate ranges from 6% to 15% [1]. To decrease the potential risk of recurrence of PVE, theoretically, the fewer the prostheses left in the heart and aortic annulus, the lower the risk of PVE recurrence. A few studies have reported that the cuff fabric can be one of the main causes of PVE [2]. The reduction in the use of prosthesis

as much as possible is crucial to reduce the incidence of PVE. The Perceval valve does not have fabric. Furthermore, AVR using Perceval performed with this valve does not require any annular pledget-supported sutures. Consequently, redo-AVR using the Perceval valve might be beneficial in the management of PVE. Although few studies have reported the use of redo-AVR using Perceval in the management of PVE [5], the long-term outcome associated with control of recurrence of PVE remains uncertain. In this case, the follow-up duration remains 6 months; therefore, further assessment and follow-up are required over a long period.

Postoperative thrombocytopenia after implantation of the Perceval valve has also recently been reported [6]. In this case, the lowest platelet count levels were observed on postoperative day 2. Thrombocytopenia resolved quickly, and a normal count was achieved within 2 weeks postoperatively. The patient had developed acute CI preoperatively. Although redo-AVR using Perceval was performed with the customary administration of heparin and antiplatelet therapy, there was no evidence of intracranial haemorrhage. The Perceval valve might have contributed to reduced implantation time, leading to the prevention of cerebrovascular complications and better outcomes. However, this should be carefully interpreted because of just a case report. Therefore, further assessment of the correlation between postoperative intracranial complication and thrombocytopenia after AVR using Perceval in such cases must be continued over a long period in the future.

4. Conclusion

In conclusion, redo-AVR using Perceval may be a useful surgical option for PVE complicated with acute cerebral infarction. It is necessary to evaluate whether AVR using Perceval may contribute to reduce the recurrence of PVE.

Declaration of competing interest

None.

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None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2021.102314>.

Ethics approval and consent to participate

This presentation is approved by the ethical committee of our hospital. Informed consent had been obtained from the patient in written and verbal form.

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Author contributions

Takasumi Goto; Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Validation, Visualization, Writing – original draft, Hiroyuki Nishi; Conceptualization, Data curation, Supervision, Writing – review & editing, Kitahara Mutsunori, Yoshinori

Yokono, Satoshi Sakakibara, Yumi Kikizawa; Data curation

Registration of research studies

This study is a case report and not a research study. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Guarantor

Hiroyuki Nishi has full responsibility of this case.

Provenance and peer review

Not commissioned, externally peer reviewed.

Availability of data and materials

All data are available from the corresponding author just on reasonable request.

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