Seven-year follow-up of Perceval sutureless bioprosthesis for aortic valve endocarditis.

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Abstract

Although some anecdotal experience concerning the use of modern sutureless aortic valve bioprosthesis for the treatment of endocarditis has been reported, no data is available on the mid-and long-term results. We describe a case of a patient successfully treated with Perceval sutureless bioprosthesis for aortic valve endocarditis and his seven years follow-up.

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ABSTRACT

Although some anecdotal experience concerning the use of modern sutureless aortic valve bioprosthesis for the treatment of endocarditis has been reported, no data is available on the mid-and long-term results. We describe a case of a patient successfully treated with Perceval sutureless bioprosthesis for aortic valve endocarditis and his seven years follow-up.

Introduction

The surgical treatment of aortic valve endocarditis remains a major challenge in cardiac surgery (1).

Even though much progress has been made in terms of management and pharmacological treatment, the ideal prosthesis to use in these cases has not been found yet.

Some surgical groups started using the Sorin Perceval sutureless bioprosthetic valve even in complicated scenarios such as aortic endocarditis (2-5).

Up to now, only a few small series have been reported in the literature, and no data are available regarding the mid-and long-term follow-up of these patients.

Case report

We report the case of a 77-year-old man affected by type II diabetes, arterial hypertension, and dyslipidaemia. At age 56 years he underwent cardiac surgery for aortic valve endocarditis due to streptococcus started from a dental abscess. The aortic root replacement was performed, and a 27 mm homograft was implanted. At age 69 years he presented a recurrence of endocarditis on the homograft, causing severe valve regurgitation. At that time the isolated bacterium was an Enterococcus *faecalis* , started from diverticulosis. Despite optimal medical therapy based on gentamicin, ceftriaxone, and vancomycin, he did not improve, and due to worsening clinical conditions, the patient was transferred to our department for surgery.

The clinical examination observed a temperature of 38,5°C, dyspnoea at rest, and sinus tachycardia. Transthoracic echocardiography (TTE) revealed a 9 mm vegetation on the homograft with severe aortic valve regurgitation. Urgent surgery was performed; the aortic prosthesis was resected, the infective tissue removed and the Perceval bioprosthesis (Livanova Group S.p.A., Saluggia,Italy) XLwas implanted.

The Cross-Clamp time was 35 minutes with a total cardiopulmonary bypass (CPB) time of 73 minutes. The post-operative transesophageal echocardiogram (TEE) showed good results without paravalvular leaks. The ICU stay was 4 days, and the total hospital stay was 19 days. The patient was periodically controlled with regular echocardiographic analysis.

At the moment, the patient lives with his wife. He is in good clinical condition, with NYHA functional class I, and no other symptoms are reported. The last TTE shows a mean transprosthesis gradient of 12 mmHg (Fig.1) without paravalvular leaks and normal ejection fraction (57%), no infective or embolic episodes were reported during the 7 years and three months follow-up time.

Discussion

Infective aortic endocarditis (IAE) represents a great challenge in cardiac surgery. The consequent clinical setting is associated with high in-hospital morbidity and mortality, ranging from 15% to 30% in the case of native valve endocarditis (1).

Moreover, in the case of prosthetic valve endocarditis (PVE), the mortality is even higher, between 4% and 30% if surgically treated, and from 24% to 46% if not surgically treated (6).

Current guidelines recommend surgical treatment as prevention of embolism or in case of severe valve disease with hemodynamic instability. The surgical strategies to treat IAE are based on the use of conventional biological or mechanical prostheses (6) or, when possible, stentless bioprostheses(7,8). Many reports describe associated procedures for annular and patch reconstruction in case of periannular abscess (9). However, these procedures are technically complex, scarcely reproducible, and highly dependent on surgeons' skills. In addition, although several kinds of prostheses have been used, the optimal valve has not been found yet and the strategy needs to be customized for each patient.

The need to find simple and reproducible solutions in the case of aortic valve endocarditis has prompted many groups to use new sutureless and rapid deployment aortic bioprostheses now available on the market (2-5,10,11).

The main advantage of these prostheses is to reduce the operative time and, mostly, to avoid further annular manipulation. Additionally, the radial force can transmit solidity to the surrounding tissues and ensure more stability to the reconstructed structures in case of extended annular endocarditis.

Despite all these alternative prostheses provide excellent hemodynamic results, little is known about the long-term outcomes and freedom from reintervention.

Before considering these prostheses as a valuable alternative option to standard biological or mechanical prosthesis more data are needed. In this context, the exceptionality of this case report is that, to the best of our knowledge, this is the first report of mid-term durability of Sutureless aortic bioprosthesis used to treat infective aortic valve endocarditis in high-risk patients.

The importance of this case is not as much related to the indication or surgical technique, but to the fundamental brick added in the complex debate of bioprosthesis durability in case of endocarditis.

We believe that Perceval sutureless aortic bioprostheses could be considered a reasonable option also in uncommon scenarios such as prosthetic valve endocarditis. Thus, Perceval could represent an important tool in the surgical armamentarium to face high-risk operations, minimizing the technical challenges of implantation and ensuring good results. However, we are aware that further studies are required to demonstrate its safety and efficacy.

Author contribution

Antonio Piperata: Conceptualization, writing, data collection.

Nicolas d'Ostrevy: data collection

Olivier Busuttil: data collection

Martina Avesani: writing

Louis Labrousse: data collection

Mathieu Pernot: Revision

Ethical Statement

It is declared that every reasonable effort was made to obtain informed consent to participate in this study. However, it is noted that there is already mention of the use of data for scientific and research purposes in the current informed consent in use at our Center. We also guaranteed the respect of anonymity and professional secrecy and used the collected data just for the scientific purposes granted in accordance with the law in force (GDPR).

References:

1. Habib G, Lancellotti P, Antunes MJ, *et al.* 2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC). *Eur. Heart J.* 2015;36:3075-3128
2. Rosello-Diez E, Cuerpo G, Estevez F. *et al.* Use of the Perceval Sutureless Valve in Active Prosthetic Aortic Valve Endocarditis.*Ann. Thorac. Surg. 2018;* 105: 1168–1174.
3. Hammond RFL, Jasionowska S, Awad WI. Aortic valve replacement with sutureless Perceval S valve: A case report of aortic root homograft failure in the setting of Streptococcus constellatus endocarditis. J Card Surg. 2020 Oct;35(10):2829-2831. doi: 10.1111/jocs.14846.
4. Weymann A, Konertz J, Laule M, Stangl K, Dohmen PM. Are Sutureless Aortic Valves Suitable for Severe High-Risk Patients Suffering from Active Infective Aortic Valve Endocarditis? *Med. Sci. Monit 2017;* 23: 2782–2787.
5. Lio A, Miceli A, Solinas M, Glauber M. Initial Experience with Sutureless Sorin Perceval S Aortic Prosthesis for the Treatment of Prosthetic Valve Endocarditis. Thorac Cardiovasc Surg. 2015 Sep;63(6):501-3. doi: 10.1055/s-0035-1556817.

6. Perrotta S, Jeppsson A, Frojd V et al. Surgical Treatment of Aortic Prosthetic Valve Endocarditis: A 20-Year Single-Center Experience.*Ann. Thorac. Surg.* 2016;101:1426–1432
7. Schneider AW, Hazekamp MG, Versteegh MI et al. Stentless bioprostheses: a versatile and durable solution in extensive aortic valve endocarditis.*Eur J Cardiothorac Surg.* 2016;49:1699-1704.
8. Repossini A,Bacco LD, Gazdag L, et all. Is the Freedom SOLO Stentless Bioprosthesis a Useful Tool for Patients with Aortic Endocarditis and Aortic Annular Destruction?*Thorac Cardiovasc Surg.* 2019; 67:644-651
9. Yoshioka D,Toda K, Yokoyama JY et al.Recent Surgical Results for Active Endocarditis Complicated With Perivalvular Abscess.*Circ J.* 2017; 81:1721-1729
10. Piperata A, Kalscheuer G, Metras A, Pernot M, Albadi W, Taymoor S, Peltan J, Oses P, Barandon L, Bottio T, Gerosa G, Labrousse L. Rapid-deployment aortic valve replacement in high-risk patients with severe endocarditis. J Cardiovasc Surg (Torino). 2020 Dec;61(6):769-775. doi: 10.23736/S0021-9509.20.11349-1.
11. Piperata A, Bottio T, Avesani M, Folino G, Bellanti E, Gerosa G. Use of rapid-deployment aortic valve prosthesis and patch reconstruction in complex endocarditis. J Card Surg. 2020 Aug;35(8):2056-2058. doi: 10.1111/jocs.14762.

FIGURES legends

Fig: 7-year echocardiogram control. A: 5-chamber section.B: 3-chamber section.C: Transprosthesis gradient

LV: left ventricle; The arrow: the prosthesis.