

Reintervention after aortic valve replacement: Comparison of three aortic bioprostheses

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Key points

- Freedom from reintervention after implantation of the Carpentier-Edwards PERIMOUNT Magna Ease valve was significantly greater than after implantation of the Trifecta and Mitroflow valves.
- SVD was responsible for a large proportion of Trifecta and Mitroflow valve failures whereas prosthetic valve endocarditis (PVE) was responsible for all Carpentier-Edwards PERIMOUNT Magna Ease valve failures.
- Age and type of prosthesis were independently associated with lower event-free survival.

Background information

- Pericardial bioprostheses are popular for patients undergoing AVR because these valves do not require lifelong anticoagulation.
- Few reports have assessed durability, valve-related events and SVD in new generation bioprostheses.

Aim

- To investigate the rate and cause of reinterventions after AVR using Trifecta, Mitroflow and Carpentier-Edwards PERIMOUNT Magna Ease valves.

Type of study

- A single-centre, retrospective study.

Endpoints

- The primary endpoint was the rate of reintervention after AVR due to SVD, PVE and other causes of reoperation.

Methods

- The study included patients who underwent AVR with Trifecta, Mitroflow and Carpentier-Edwards PERIMOUNT Magna Ease valves between October 2009 and December 2018.
 - Patients with concomitant procedures were included.
- All patients underwent a comprehensive echocardiographic examination 6–8 weeks postoperatively.
- Echocardiography was available for all patients after hospital discharge.
- SVD was defined as a dysfunction or deterioration involving the operating valve (excluding infection and thrombosis) as determined by reoperation, autopsy or clinical investigation.
- Univariate and multivariate predictors of reintervention were obtained using logistic regression models.



Results

Table 1: Baseline and procedural characteristics

	Carpentier-Edwards PERIMOUNT Magna Ease (n=923)	Trifecta (n=719)	Mitroflow (n=362)	P-value
Age (mean ± SD years)	71.2 ± 7.8	71.6 ± 8.0	72.0 ± 7.9	–
Male (%)	71.2	59.7	55.0	<0.0001
Valve size 19- or 21-mm (%)	21.1	28.8	38.2	<0.0001
Infective endocarditis incidence rate (%)	6.2	3.2	3.9	0.011
Bicuspid valve pathology incidence (%)	9.4	9.6	16.0	<0.001

Table 2: Rate and causes of reintervention after AVR

	Carpentier-Edwards PERIMOUNT Magna Ease (n=923)	Trifecta (n=719)	Mitroflow (n=362)
Reintervention rate (%)	0.7	4.7	6.1
Reasons:			
PVE (%)	100.0	50.0	31.8
SVD (%)	–	41.2	63.6
Non-SVD (%)	–	5.9	4.5
Other (%)	–	2.9	–

Rate and causes of reintervention after AVR

- Mean follow-up was 4.1 ± 2.4 years.
- Reintervention was performed in 62 (3.1%) patients (Table 2).
- The main SVD mechanisms were progressive degeneration in the Mitroflow group and severe regurgitation due to cusp tear in the Trifecta group.
- Eight-year event-free survival was significantly higher in patients receiving the Carpentier-Edwards PERIMOUNT Magna Ease valve (99%) than in those receiving the Trifecta (91%) and Mitroflow (88%) valves (p<0.001).
- Independent predictors of reintervention were:
 - Age: HR 0.9, 95% CI 0.9–0.9, p<0.0001
 - Prosthesis type
 - Trifecta valve: HR 6.3, 95% CI 2.6–15.2, p<0.0001
 - Mitroflow valve: HR 6.0, 95% CI 2.4–15.2, p<0.0001.
- Prosthesis size was not an independent predictor for reintervention.

Limitations

- This was a single-centre, retrospective study.
- Mean follow-up was relatively short.

Conclusion

Patients receiving the Carpentier-Edwards PERIMOUNT Magna Ease valve had significantly greater freedom from reintervention than those receiving the Trifecta and Mitroflow valves. Carpentier-Edwards PERIMOUNT Magna Ease valve failures were all due to PVE. In contrast, Trifecta valve failure was largely due to PVE or SVD, while Mitroflow valves failed primarily because of SVD. Age and type of prosthesis were independent predictors of reintervention.

This document is a summary of the Lam KY et al. paper and covers key information including aim, type of study, methods, results, limitations and conclusions.

The full publication is available at:
http://bit.ly/lam_avr

Abbreviations

AVR: aortic valve replacement
CI: confidence interval
HR: hazard ratio
PVE: prosthetic valve endocarditis
SVD: structural valve degeneration

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