

Sutureless prostheses inside degenerated stentless aortic valves and bioroots – clinical outcomes from a multi-centre experience



Background / Study Objective

- Valve-in-valve catheter based treatment is an attractive alternative to redo aortic valve replacement in elderly patients.
- However, in stentless aortic valves and bioprosthesis, valve-in-valve procedures are associated with increased peri-interventional risks.
- According to an international registry, malpositioning occurs in >10%, implantation of a second prosthesis in >7% and coronary obstruction in 6% and the rate of paravalvular regurgitation is higher as compared to valve-in-valve procedures inside stented valves.
- Redo aortic valve replacement using sutureless aortic prostheses may provide a more efficient treatment of degenerated stentless valves with potentially lower procedural risk.
- We assessed outcomes in a multi-centre experience.



Methods

- From 2018 to 2023, 17 patients received a Perceval sutureless valve (Corcym UK Limited, London, UK) inside a degenerated Freestyle prosthesis (Medtronic Inc., Dublin, Ireland) in 16 patients and inside a degenerated bioroot in 1 patient at three high-volume centers.
- We assessed clinical outcomes retrospectively.



Patients

- Mean age was $71.1 \pm \text{SD } 15.1$ years .
- Mean EuroSCORE II was $13.5 \pm \text{SD } 15.8$ %, STS predicted risk of mortality was $5.9 \pm 11.7\%$.
- Mean transvalvular aortic gradient before the procedure was 25.3 ± 19.9 mmHg and mean left ventricular ejection fraction was $53.5 \pm 8.5\%$.
- 70.6% (12/17) Patients had moderate or severe aortic regurgitation.



Results 1

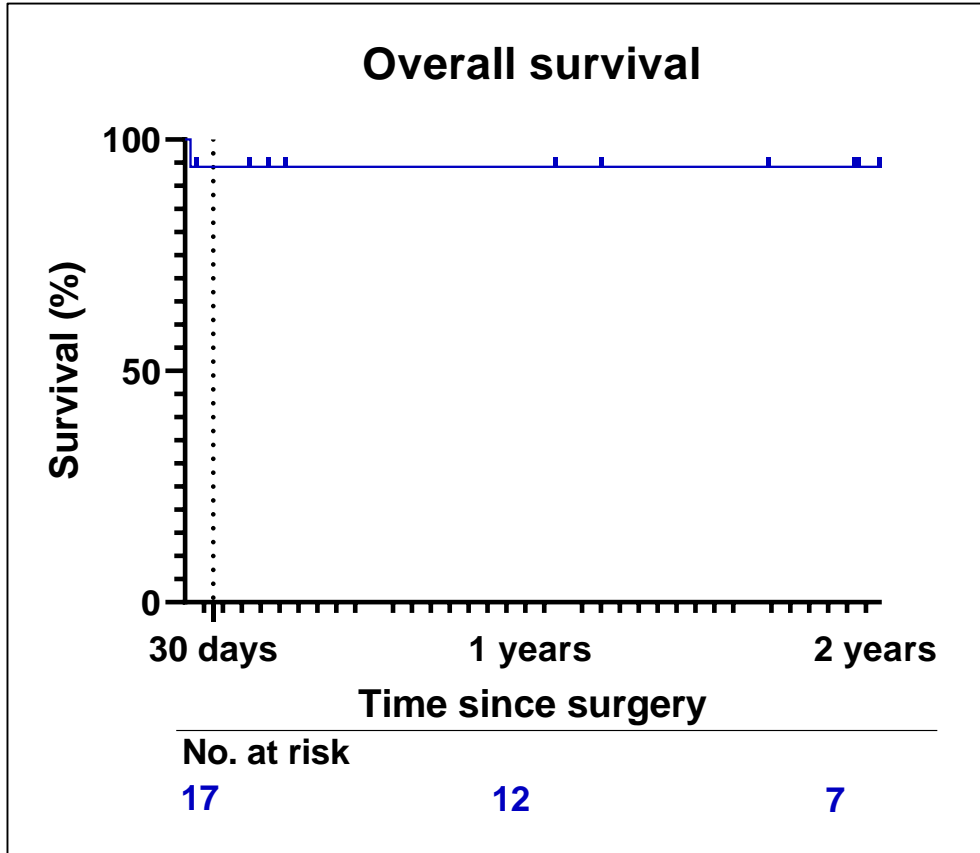
Procedural data	N=17
Arterial cannulation (%)	
- femoral	9 (52.9)
- central	5 (29.4)
- axillary	3 (17.7)
Concomitant procedures (%)	
- coronary artery bypass grafting	2 (11.8)
- Myectomy (Morrow)	2 (11.8)
- Mitral valve procedure	3 (17.7)
- Tricuspid valve procedure	2 (11.8)
- Transcatheter valve removal	1 (5.9)
Size of previously implanted Freestyle/Bioroot (%)	
- 21mm	3 (17.7)
- 23mm	6 (35.2)
- 25mm	4 (23.5)
- 27mm	2 (11.8)
- 29mm	2 (11.8)
Perceval size implanted (%)	
- S	4 (23.5)
- M	5 (29.4)
- L	5 (29.4)
- XL	3 (17.7)
Implant success (%)	17 (100)

Procedural times	N=17
Cardiopulmonary bypass time, mins \pm SD	85.2 \pm 41.8
Aortic Cross Clamp time, mins \pm SD	44.5 \pm 23.6
Procedural time, mins \pm SD	181.1 \pm 57.8

Postoperative data until 30 days	N=17
Postoperative mean gradient, mmHg \pm SD	12.5 \pm 4.7
Stay on ICU, nights \pm SD	2.8 \pm 1.9
Permanent pacemaker implantation	0
Paravalvular regurgitation	
- mild	1 (5.9)
- moderate or severe	0
Re-operation for bleeding, (%)	1 (5.9)
Stroke, (%)	1 (5.9)
Renal failure, (%)	2 (11.8)
Mortality, (%)	1 (5.9)



Results 2



Device success at 30 days (VARC-3)

- Technical success
- Freedom from mortality
- Freedom from surgery or intervention related to the device or to a major access site or cardiac structural complication
- Intended performance of the valve (mean gradient <20mmHg, less than moderate aortic regurgitation)

94.1% (16/17)



Conclusion

- Implantation of transcatheter heart valves inside stentless surgical valves and bioroots such as the Freestyle prosthesis is challenging and associated with a high rate of peri-procedural complications.
- We present the largest cohort of sutureless valves using the Perceval prosthesis implanted in these patients reported so far.
- Clinical outcomes were favourable, rate of mortality was lower than predicted by EuroSCORE II in these elderly high-risk patients.
- Hemodynamic outcomes were excellent, with no paravalvular leaks and a mean transvalvular gradient well below 20mmHg in all patients.
- Heart teams should consider this treatment concept when discussing patients with failed stentless valves and bioroots.

