001336

Structural valve degeneration after ten-years from aortic valve replacement with pericardial prosthesis in non-elderly adults

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Background / Study Objective

- Structural valve degeneration (SVD) remains the *«Achille heel»* of biological prostheses and younger age at implantation is reported to accelerate the degeneration process
- Previous studies on the topic are usually conducted without a standardized definition of SVD, and reoperation is often considered the proxy variable of SVD
- Perimount Magna Ease (PME) has been launched on the market in 2008 and it is currently one of the most implanted valve worldwide
- Despite that, few studies reported long-term outcome of PME in non-elderly adults
- It is the aim of this study to analyze the incidence of SVD in non-elderly patients at long-term follow-up, with the standardized definition of SVD currently accepted in the literature

Patients

- January 2010 - December 2012: 871 consecutive patients implanted with Perimount Magna Ease (PME) at a single Cardiac Surgery Institution.
- *Inclusion criteria*: isolated and combined aortic valve replacement (AVR)
- *Exclusion criteria*: age <18 years (n28), AVR with any concomitant aortic annular enlargement (n13), implantation of PME only in different positions (i.e. mitral/pulmonary valve, n 141).

- Final study population: 689 patients who underwent AVR with PME valve:
  - Patients aged ≤70 years *(n260, 37.7%)* were more likely to be affected by bicuspid aortic valve disease *(22.4% vs 4.8%, p<001)*, ascending aorta aneurism *(24.1% vs 3.8% p<001),* chronic kidney disease requiring dialysis *(1.9% vs 0.2%, p0.02)* and to have had a prior cardiac surgery operation *(8.5% vs 2.8%, p<001)*

  - Patients aged >70 years (*n429, 62.3%*) were more likely to be affected by multiple comorbidities (diabetes mellitus, hypertension, dyslipidemia, coronary artery disease) and reported higher EuroSCORE II *(2.7% vs 4.09%, p<001)*

Methods

- Complete ten-year clinical and echocardiographic follow-up was obtained in all patients
- Logistic regression was used to calculate the propensity score with adjustment for confounding baseline variables, in order to select pairs of ≤70 vs >70 aged patients having similar preoperative risk profile. Descriptive statistics with univariate analyses were used to assess differences between groups.
- Kaplan-Meier survival estimation were performed to assess ten-year freedom from moderate-to severe structural valve degeneration (SVD), redo, endocarditis and cardiovascular mortality
- A sub-analysis of patients aged ≤70 years old was performed. Three age-based categories *(≤50 years vs 51-60 years vs 61-70 years)* were compared in terms of freedom from SVD, redo, endocarditis and cardiovascular mortality. Cox regression analysis was performed to assess risk factors for the development of moderate-to severe SVD.
- Statistical analysis was performed with SPSS for Windows (Version 27.0, SPSS Inc., Chicago, IL, USA). A *p* value < 0.05 was considered for statistical significance.

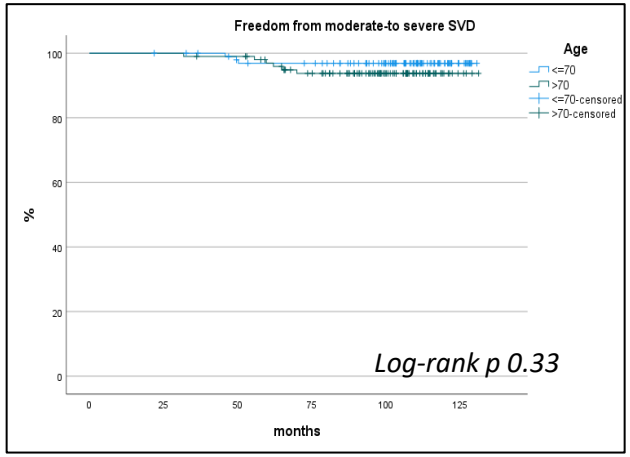
Results 1

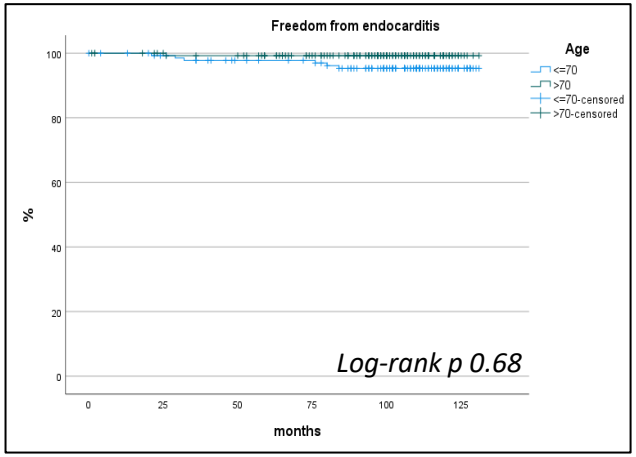
- No differences in hospital death and major post-operative outcome between the two groups (Tables)
- No statistical differences in freedom from moderate-to-severe SVD, REDO AVR and endocarditis (Graphs)
- Freedom from cardiovascular mortality was similar between the two groups *(92.7% vs 85.8% at 10y in ≤70 vs >70 years old; p 0.78)*

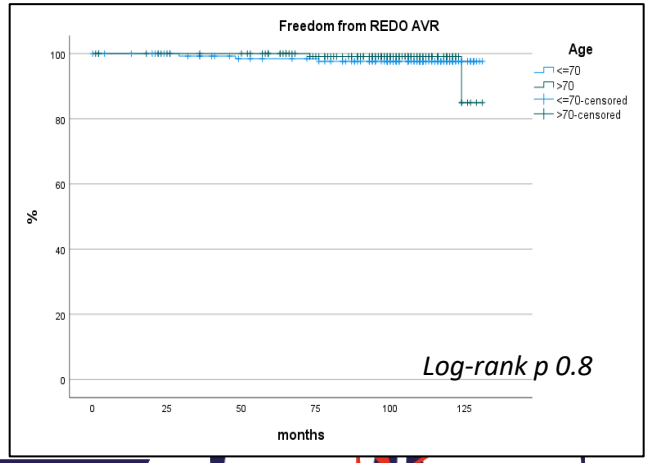
PS matched population *(n282: 141 pairs)*

Intraoperative characteristics n(%)	<=70years old (n 141)	>70 years old (n 141)	*p*
Isoltatad AVR	81 (46.6)	93 (53.4)	*0.14*
AVR + MVR	13 (9.2)	8 (5.7)	*0.26*
AVR+ CABG	22 (51.2)	21 (48.8)	*0.87*
AVR+ Asc.Ao	18(54.5)	15 (10.6)	*0.58*
CPB time	101.9	93.02	*0.06*
Aortic clamp time	80.2	71.14	*0.01*
Prosthetic size			
19-21-23mm	86 (61)	92 (65.2)	*0.46*
25-27-29mm	55 (39)	49 (34.8)	

Postoperative outcome n(%); m(SD)	<=70years old (n 141)	>70 years old (n 141)	*p*
In-hospital mortality	1 (0.7)	0	*0.32*
Bleeding requiring surgical revision	8 (5.7)	5 (3.5)	*0.3*
Sepsis	0	3 (2.1)	*0.08*
Acute kidney injury reuiring dyalisis	0	1 (0.7)	*0.8*
Prolonged ventiation	14 (9.9	14 (9.9	*0.9*
Pacemaker implantation	3 (2.1)	4 (2.8)	*0.7*
Stroke	2 (1.4)	3 (2.1)	*0.65*
Perioperative myocardial infarction	1 (0.7)	0	*0.32*
New onset atrial fibrillation	38 (26.9)	46 (32.6)	*0.42*
ICU days	2.75 (6.7)	2.87 (5.9)	*0.89*

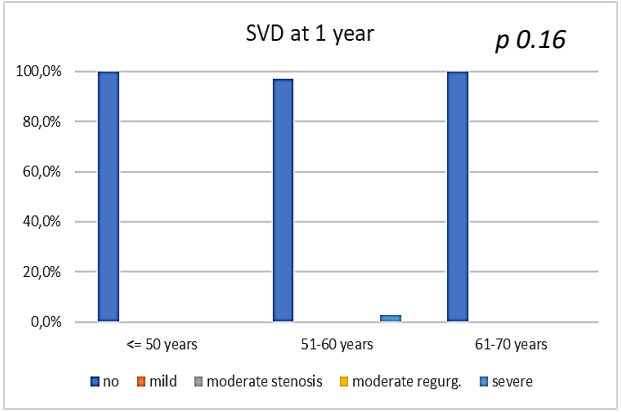


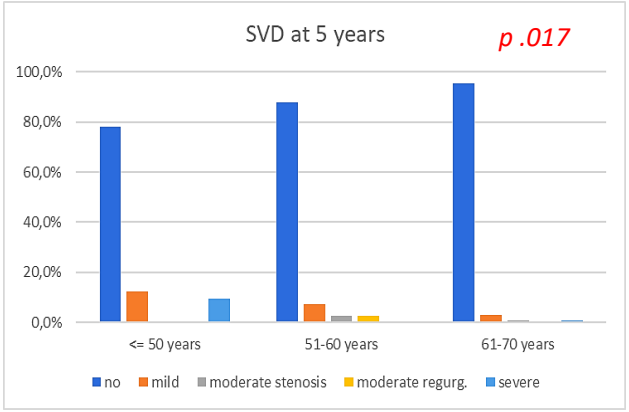


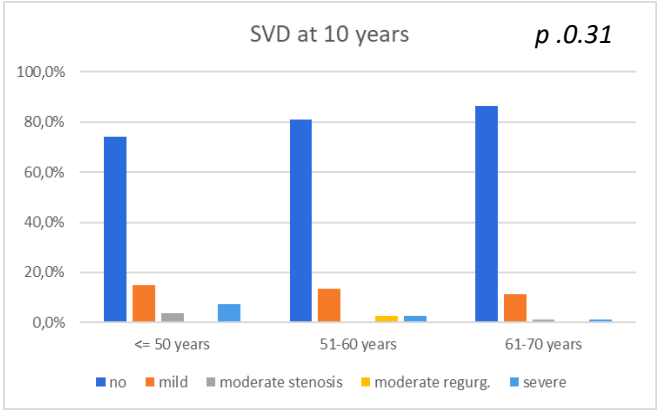


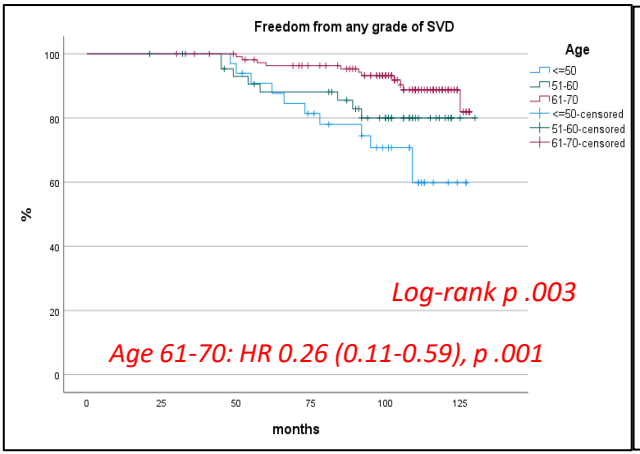
Results 2

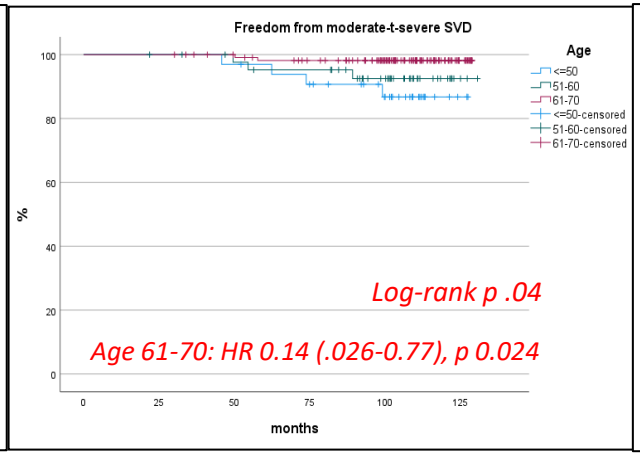
Sub-analysis in Patients ≤70 years old

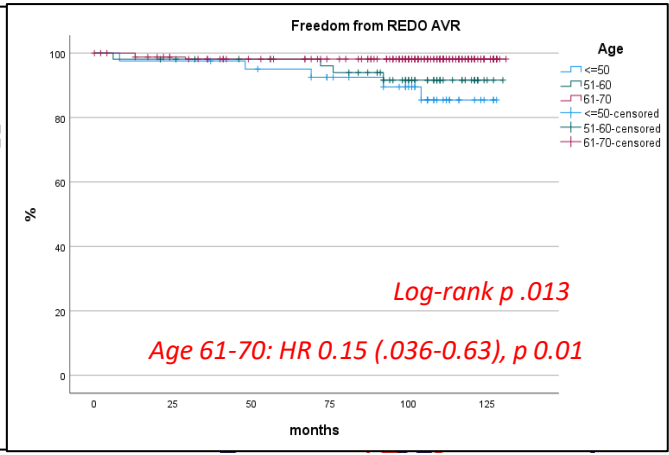












- No statistical difference in ten-year freedom from cardiovascular mortality *(94.8% vs 96.2% vs 93.9% in ≤50 vs51-60 vs 61-70 years; p0.9)* and from endocarditis *(95.5% vs 09.3% vs 95% at 10 y % in ≤50 vs51-60 vs 61-70 years; p 0.18)* between the three age categories

Conclusion

- Perimount Magna Ease bioprostheses confirmed excellent short to long-term outcome in both patients aged ≤70 years and >70 years old, without significant difference in freedom from moderate-to-severe SVD, REDO and endocarditis

- However, when patients aged ≤70 years old were considered, SVD seems to begin already at five years after surgery

- Patients younger than 50 years old and patients between 51-60 years showed a significantly higher incidence of any SVD, moderate-to-severe SVD and REDO

- Age > 60 years resulted to be «protective» for SVD, therefore 60 years should be considered as the real cut-off for accelerated SVD, possibly mandating the use of new generation bioprostheses with the potential for delaying SVD