

Analysis of the fibrotic substrate and post-operative ventricular arrhythmias in patients undergoing surgery due to valvular aortic stenosis and left ventricular outflow tract obstruction

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Introduction

- Aortic stenosis is related to valvular pathologies (AVS) and/or subvalvular alterations (ASVS)
- Due to hemodynamic impairment it often requires cardiac surgery
- Both, AVS and ASVS, are associated with cardiac hypertrophy, potentially resulting in tissue fibrosis, which is known to provoke ventricular arrhythmias
- Molecular and histological differences in severity of fibrosis were not investigated yet
- Furthermore, clinical implications on post-operative arrhythmias, are unknown

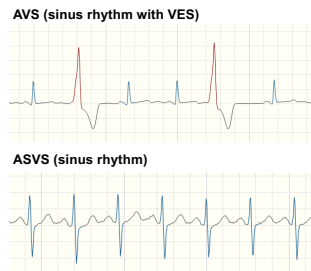
Methods

- Intraoperative collection of left ventricular septal specimen of cardio-surgical patients undergoing myectomy and/or aortic valve replacement:
 - Valvular (AVS, n=7) versus subvalvular (ASVS, n=8) pathologies
- Histology: Masson's trichrome stain
- Molecular: Western blots of fibrosis-related proteins
- Evaluation of clinical implication on post-operative arrhythmias
 - Holter monitoring at the 5th post-operative day

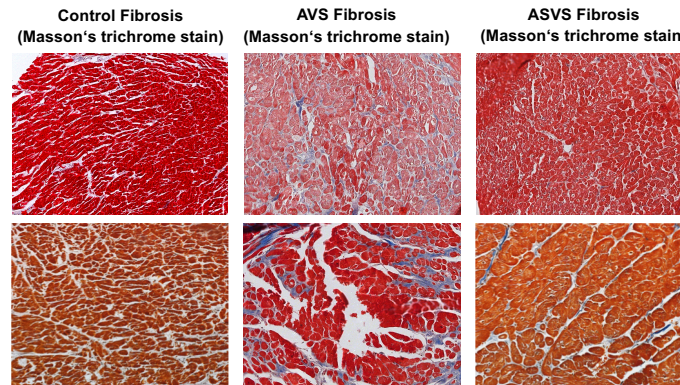
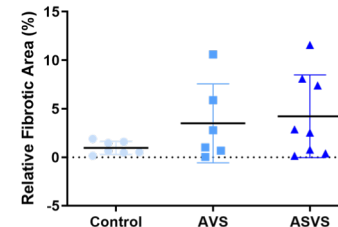
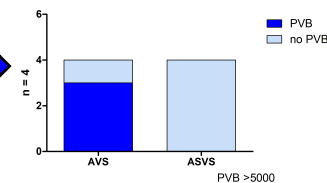
Results

Study population characteristics	AVS (n=7)	ASVS (n=8)
Male	4/7	3/8
Age (years)	70.7±6.8	60.0±19.0
BMI (kg/m ²)	23.9±2.6	29.0±2.8*
KHK	5/7	4/8
COPD	0/7	1/8
Arterial hypertension	7/7	5/8
Hyperlipidemia	6/7	6/8
Diabetes mellitus	3/7	0/8
Nicotine	3/7	4/8
LV EF (%)	61.4±11.1	64.0±5.7
IVSd (mm)	16.0±3.3	21.2±6.4
LVEDD (mm)	43.4±8.9	36.9±7.4
TAPSE (mm)	20.6±3.2	23.8±4.7
AV Pmax (mmHg)	85.0±26.6	58.9±37.2
AV Pmean (mmHg)	51.4±18.1	31.8±19.8

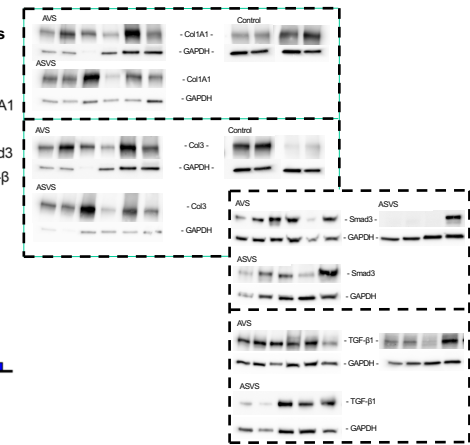
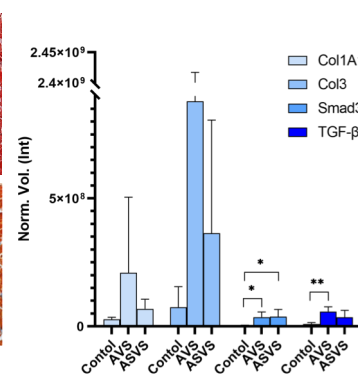
Holter analysis



Increased Incidence of PVB on 5th Post-Operative Day



Western Blot of Fibrosis-relevant Proteins



Conclusion

- In comparison to ASVS, AVS is associated with progressive fibrotic remodeling
- This finding could also promote a higher incidence of post-operative ventricular arrhythmias
- Further studies need to unveil the association of fibrosis and post-operative arrhythmias of patients undergoing myectomy and/or aortic valve replacement due to aortic stenosis

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The authors have no conflict of interest to declare.

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