



Combining TAVR and TMVR: Simultaneous Interventional Aortic And Mitral Valve Replacement In Degenerated Bioprostheses Or Mitral Annular Calcification

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Objectives

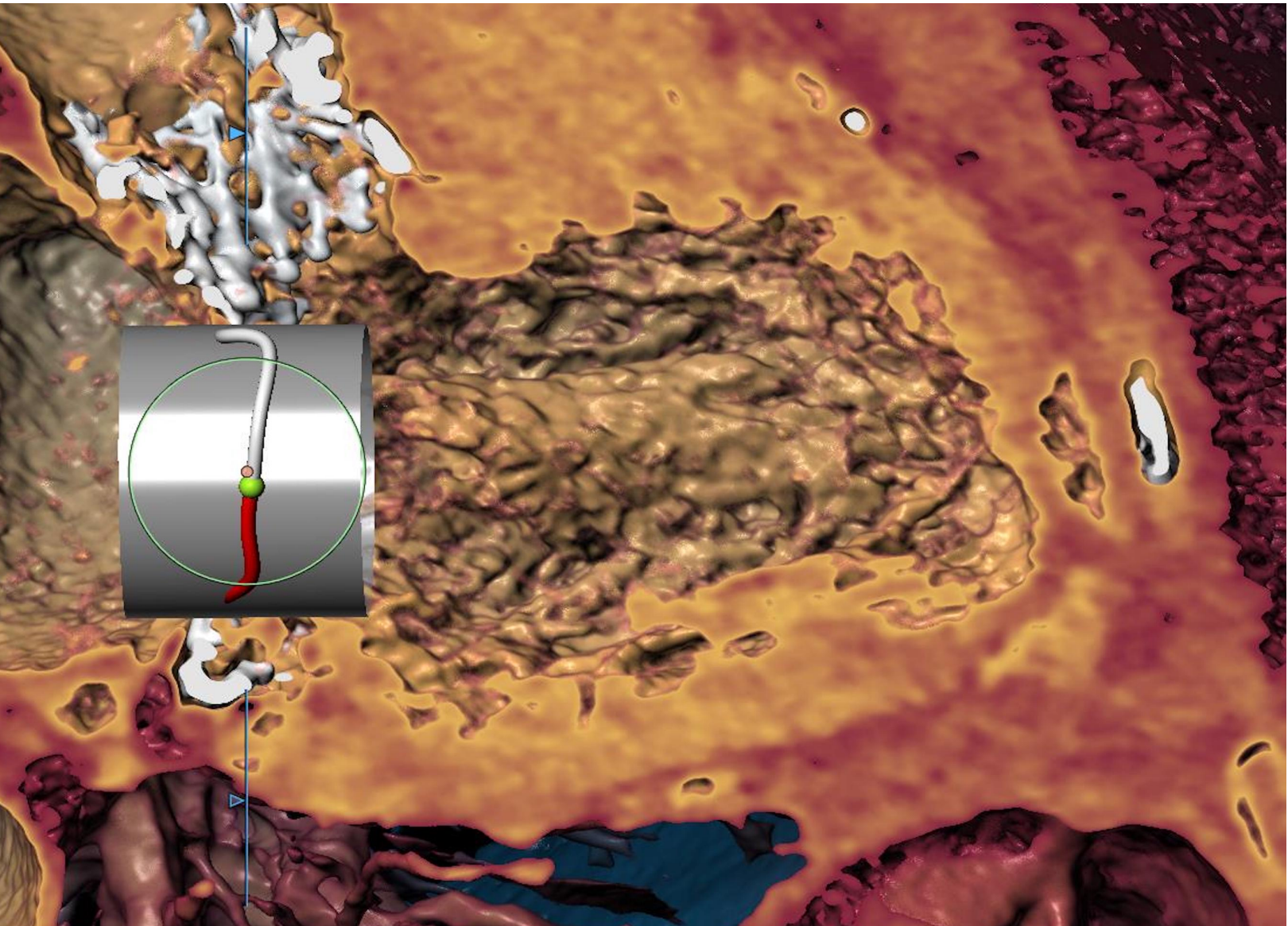
With aging patient population, the demand for patient-tailored treatment of failing biological or transcatheter prostheses is rising. While transcatheter valve-in-valve implantation is established for high-risk patients, TMVR is also gaining importance. The outcome of patients with simultaneous TAVR/TMVR is not yet well analyzed.

Methods

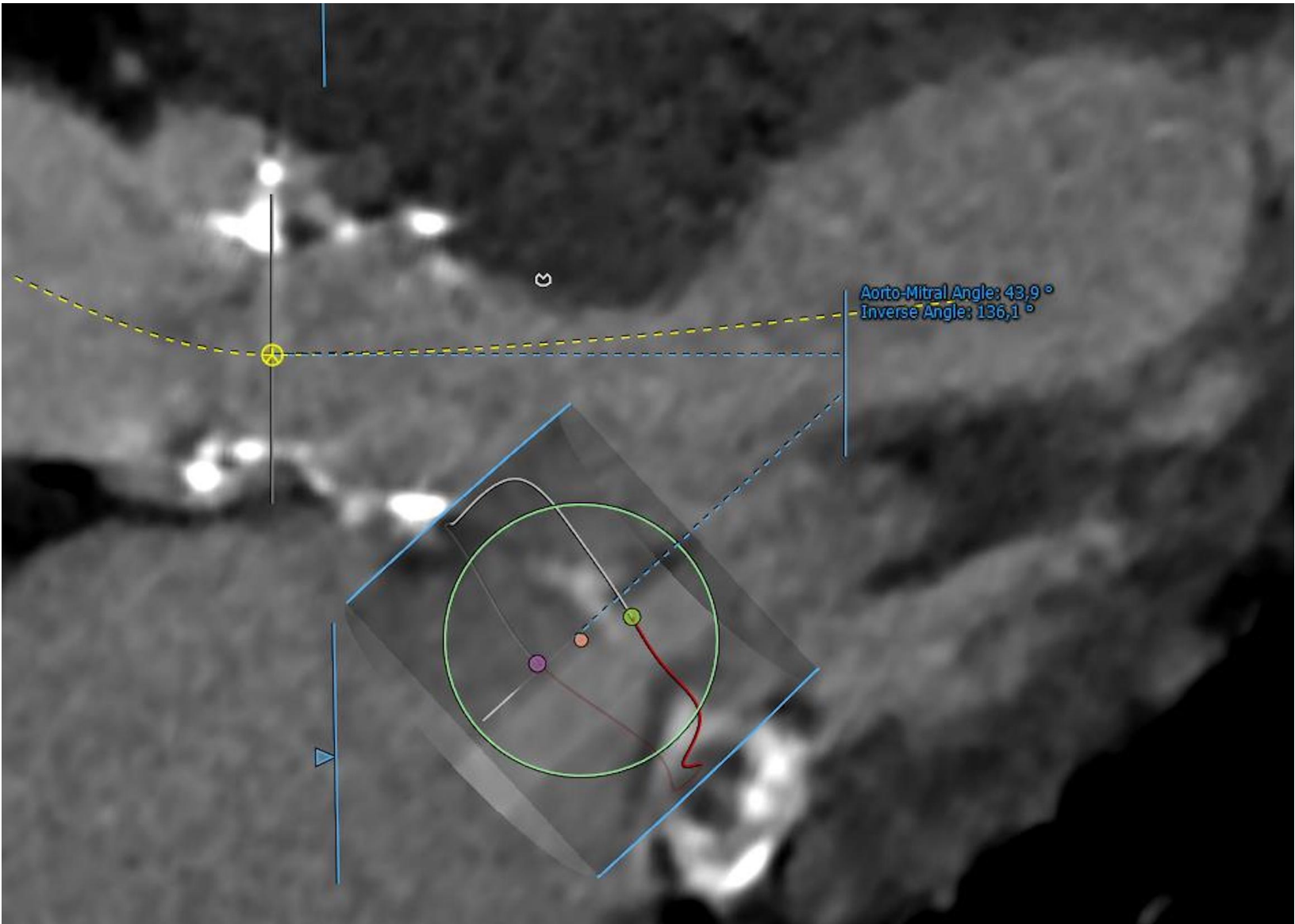
Preoperative screening of patients for double valve intervention included 4D-CT analyzing mitral annular and neo-LVOT morphology, and aortic root anatomy. Procedural characteristics, perioperative complications, and bioprosthetic valve function were assessed according to VARC-3 criteria. Follow-up included TTE and evaluation of NYHA class.

#	Age (years)	Access AV	Size (mm)	Access MV	Size (mm)	Order of procedures	Previous AV surgery	Previous MV surgery/MAC
1	44	transapical	23, BEV	transapical	29, BEV	AV → MV	bio	bio
2	77	transapical	23, BEV	transapical	29, BEV	AV → MV	bio	bio
3	73	transapical	27, SEV	transapical	29, BEV	MV → AV	-	bio
4	60	transapical	23, BEV	transapical	26, BEV	AV → MV	bio	bio
5	84	transfemoral	26, SEV	transseptal	29, BEV	AV → MV	bio	MAC
6	77	transfemoral	26, SEV	transseptal	26, BEV	AV → MV	-	bio
7	72	transfemoral	29, SEV	transseptal	29, BEV	AV → MV	bio	bio
8	81	transfemoral	23, SEV	transseptal	29, BEV	MV → AV	TAVR	MAC
9	78	transapical	23, BEV	transapical	29, BEV	AV → MV	bio	MAC
10	57	transfemoral	25, SEV	transseptal	29, BEV	AV → MV	-	MAC
11	81	transfemoral	25, SEV	transseptal	29, BEV	MV → AV	-	MAC
12	81	transfemoral	26, SEV	transseptal	29, BEV	AV → MV	bio	bio
13	82	transfemoral	29, BEV	transseptal	29, BEV	AV → MV	-	MAC

AV = aortic valve, bio = biological valve prosthesis, BEV = balloon-expandable valve, MAC = mitral annular calcification, MV = mitral valve, SEV = self-expandable valve, TAVR = transcatheter aortic valve replacement



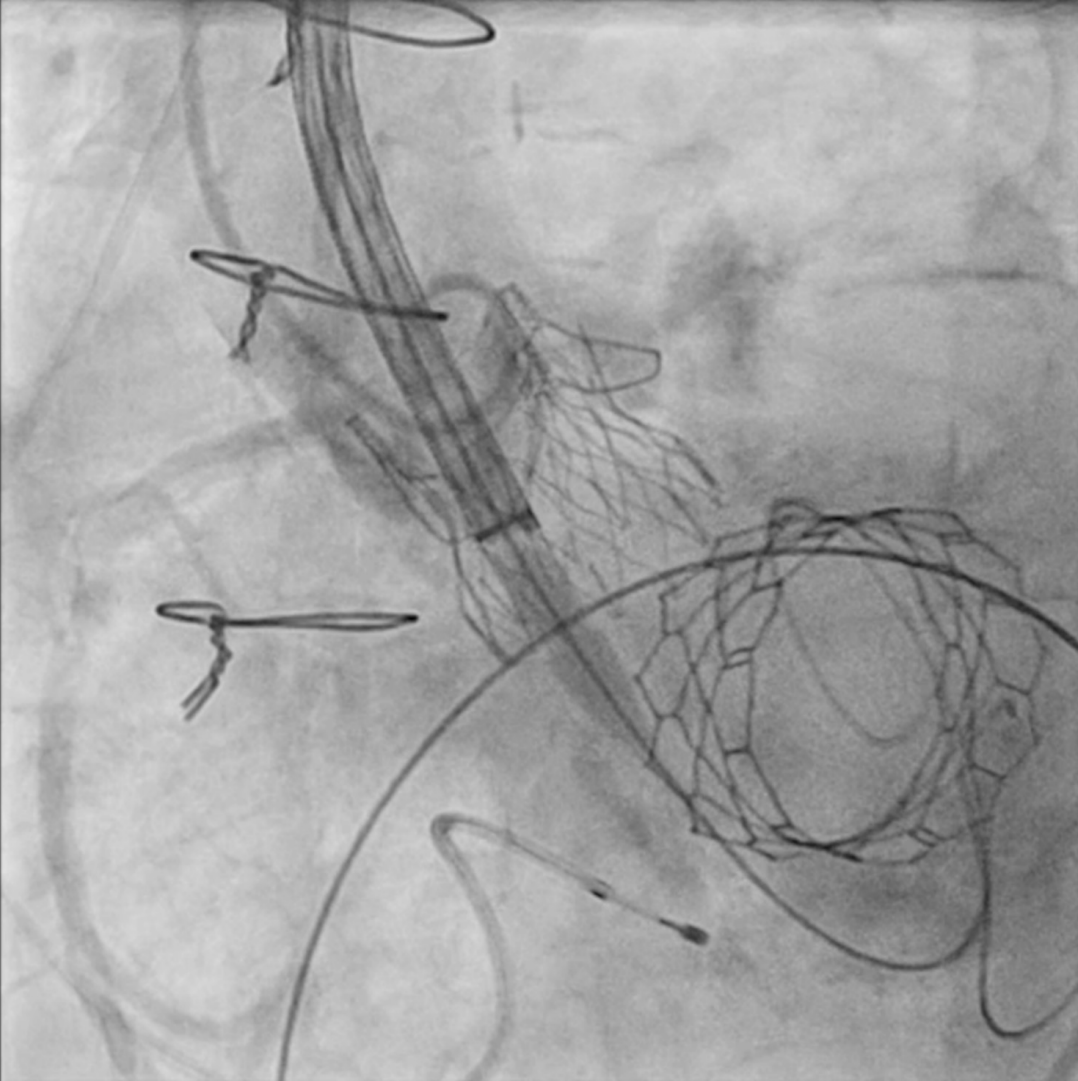
Virtual implantation of a 29 mm balloon-expandable valve in MAC.



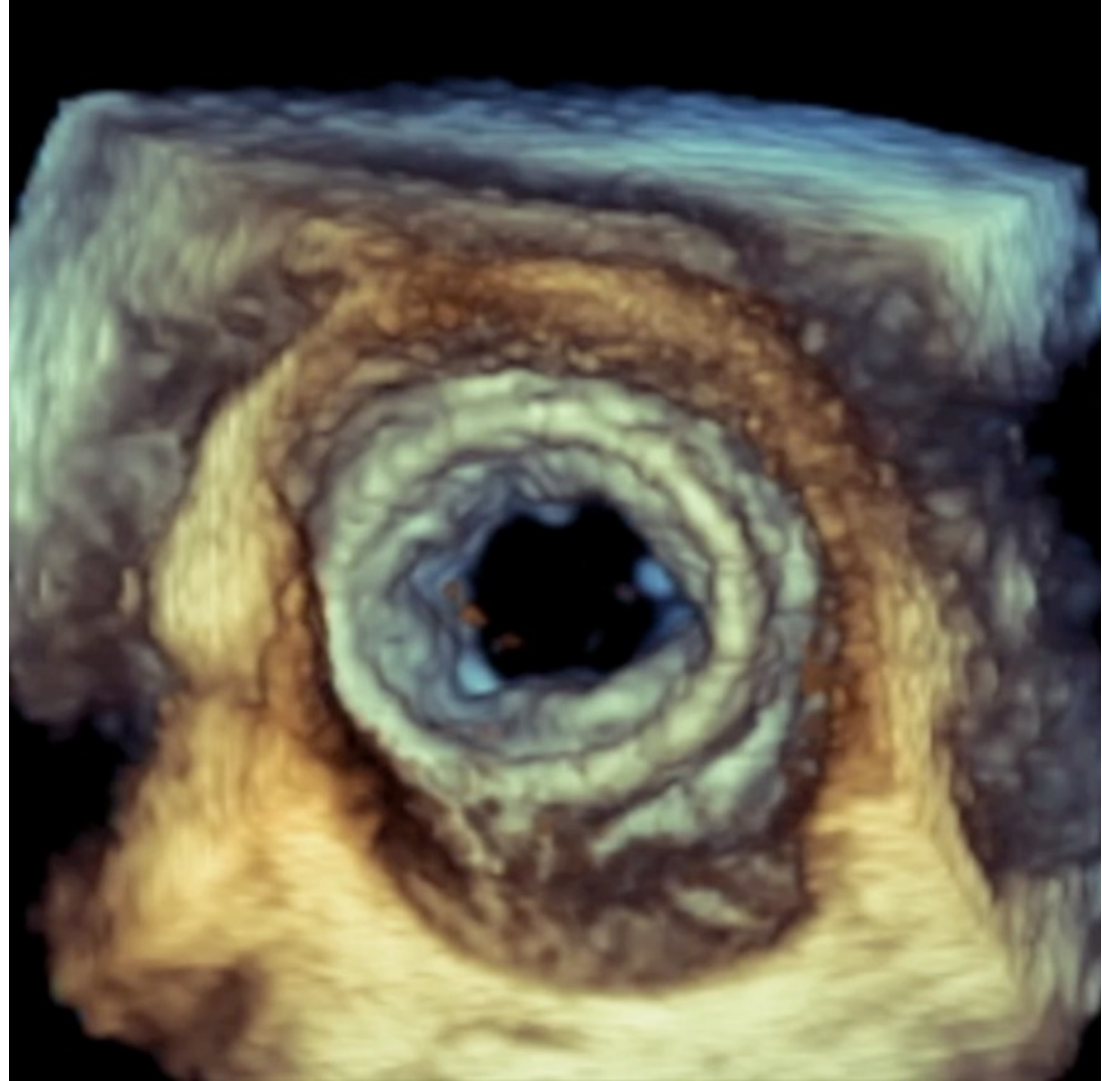
Measurements for the aorto-mitral angle and multiplanar reconstruction of the mitral annulus and THV.



THV implantation in MAC via transseptal access.



Initial deployment of THV in failed THV, positioning following the native annulus.



Display of THV-in-MAC via intraprocedural 3D transesophageal echocardiography.

Results

Baseline characteristics	
Age	72.7 ± 11.8 years
Female gender	8 (61.5%)
Median logEuroScore	24.6% ± 15.5%
NYHA Class	III to IV
Periprocedural characteristics	
Stroke	0 (0%)
Conversion to surgery	0 (0%)
Reexploration for bleeding	1 (7.7%)
Permanent pacemaker	2 (15.4%)
Hospital length of stay	6.7 days (min. 3 - max. 11 days)
Anticoagulation at discharge	Aspirin with Factor Xa inhibitor <i>or</i> Phenprocoumon
NYHA Class at discharge	I to II
30-day mortality	2 (15.4%)
TTE at discharge	
No/mild MR	12 (92.3%)
MR I-II	1 (7.7%)
Mean MV gradient	5 ± 1mmHg
Mean AV gradient	12.8 ± 8.1mmHg
Follow-Up	
Median Follow-Up time	2.4 ± 2.9 years
NYHA Class	I to II
Kaplan-Meier estimated survival	69.2% at 1 year, 51.9% at 2 years

Conclusion

Careful CT-based patient selection can identify eligible patients for simultaneous TAVR/TMVR. In **high-risk patients** with aortic valve stenosis and mitral valve disease with MAC or failing bioprosthesis, **early mortality** after combined TAVR/TMVR was **lower than predicted** by risk scores. Simultaneous TAVR/TMVR provides a **fast recovery** and **solid relief of symptoms**.



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Literature

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