Masked Gradients: Hemodynamic Impact of mTEER on Aortic Stenosis Classification

Treatment of Multi Valve Disease

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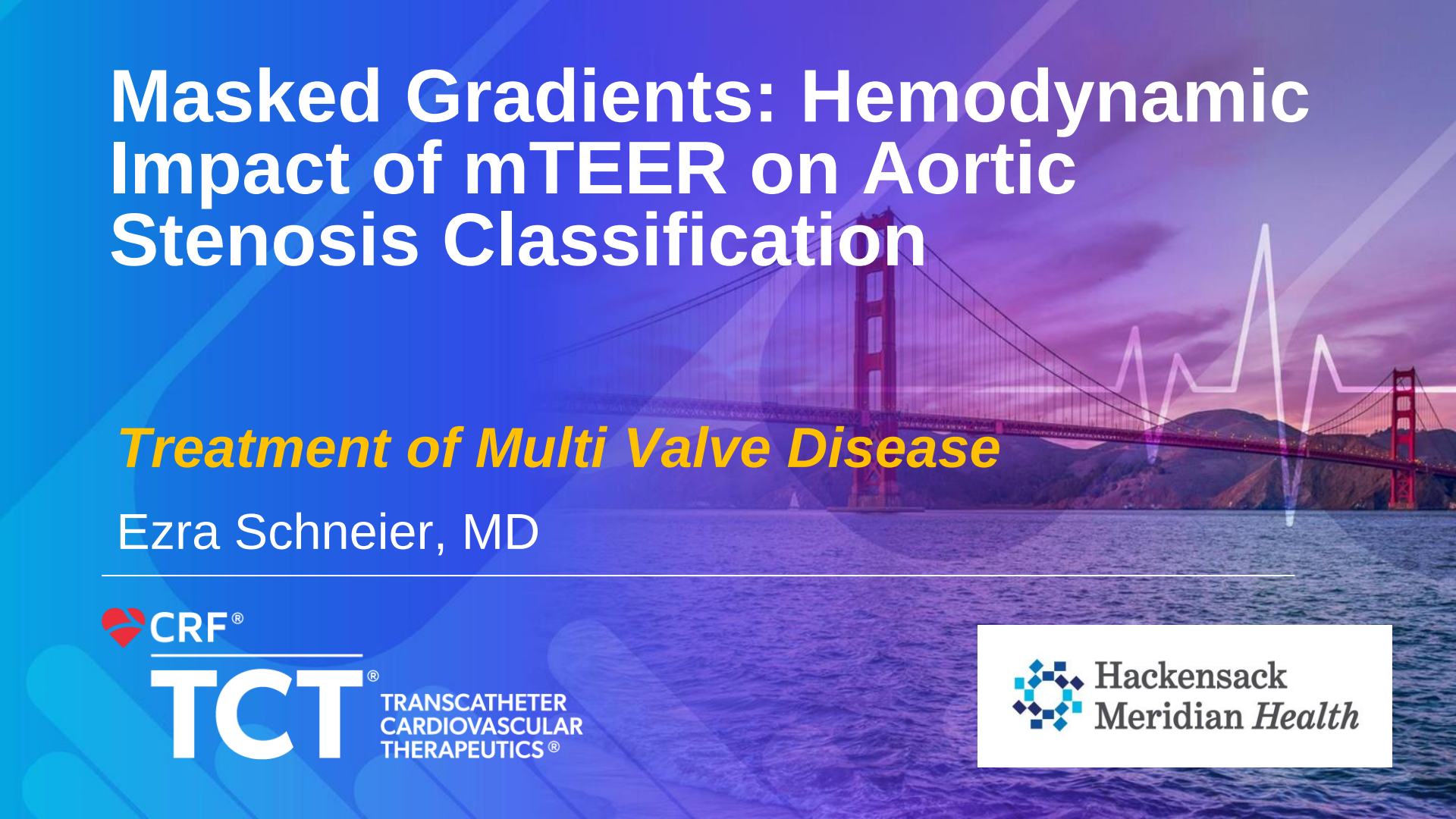


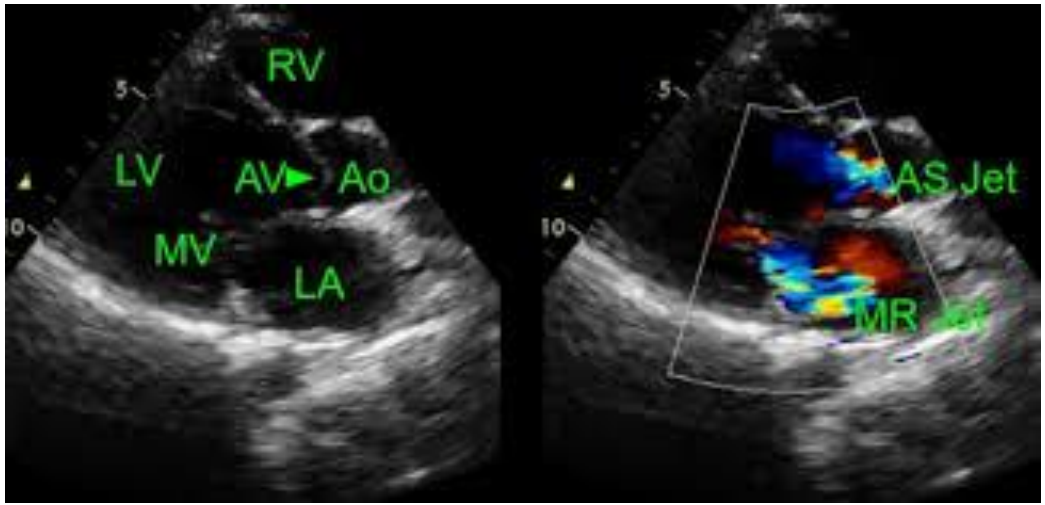
Hackensack Meridian Health

Disclosure of Relevant Financial Relationships

I, Ezra Schneier, DO NOT have any financial relationships to disclose.

AS and MR: A Complex Hemodynamic Interplay

- 18% of patients with severe MR have at least mild AS
- Patients with severe MR have been shown to have inconsistencies in aortic stenosis severity grading
- The AHA/ACC recommend multimodality imaging to patients with combined valvulopathies



1. Šeman M, Stephens AF, Walton A, et al. Journal of the American Heart Association. 2023;12(4):e025648. doi:10.1161/JAHA.122.025648.
2. Lee PH, Hong JA, Sun BJ, et al. Journal of the American Society of Echocardiography : Official Publication of the American Society of Echocardiography. 2018;31(1):26-33.

Background

- MR has been shown to lower the forward stroke volume ejected through AV
- MR possibly confounding the AS severity
- Prior to mTEER, patients would have both surgically repaired

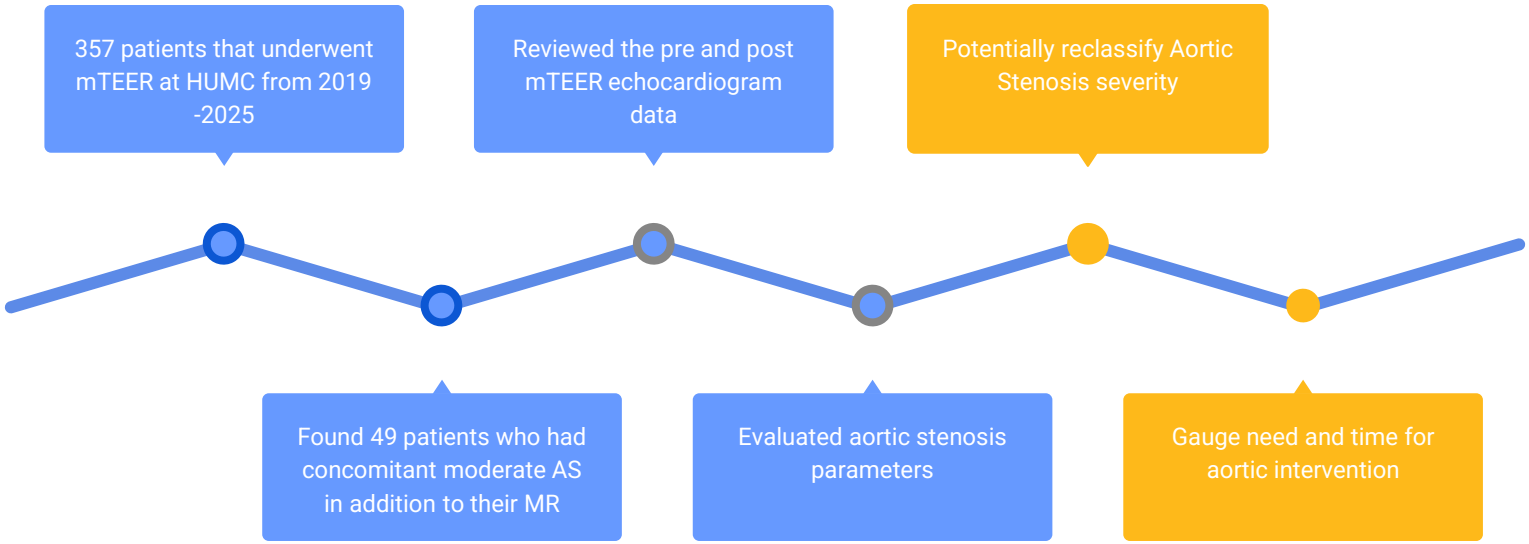
1. Impact of Concomitant Mitral Regurgitation on Transvalvular Gradient and Flow in Severe Aortic Stenosis: A Systematic Ex Vivo Analysis of a Subentity of Low-Flow Low-Gradient Aortic Stenosis. Katte F, Franz M, Jung C, et al. EuroIntervention : Journal of EuroPCR in Collaboration With the Working Group on Interventional Cardiology of the European Society of Cardiology. 2018;13(14):1635-1644. doi:10.4244/EIJ-D-17-00476.
2. Concomitant Mitral Regurgitation in Patients With Low-Gradient Aortic Stenosis: An Analysis From the German Aortic Valve Registry. Alushi B, Ensminger S, Herrmann E, et al. Clinical Research in Cardiology : Official Journal of the

Study Hypothesis

- Patients with moderate aortic stenosis and concomitant severe mitral regurgitation who undergo mTEER will have a subsequent change in transaortic gradient post procedure

- Question: **What is the true AS severity once MR is corrected?**

Study Design Overview



Study Design: Methods

- Single center retrospective cohort patients w mTEER 2019-2025

- 49 patients with severe MR and moderate AS
  - Moderate AS defined as AVA 1.0–1.5 cm^2 or indexed AVA 0.60–0.85 cm^2/m^2 with MPG 20–35 mmHg

- Excluded patients with prior valve intervention

Patient Demographics

- 25 Male, 24 Female
- Average age 81 (60-91)
- 59% White, 19% African American, 22% Other
- Comorbidities:
  - 88% HTN
  - 44% DM
  - 51% Afib
  - 48% prior PCI
  - 55% smoking history

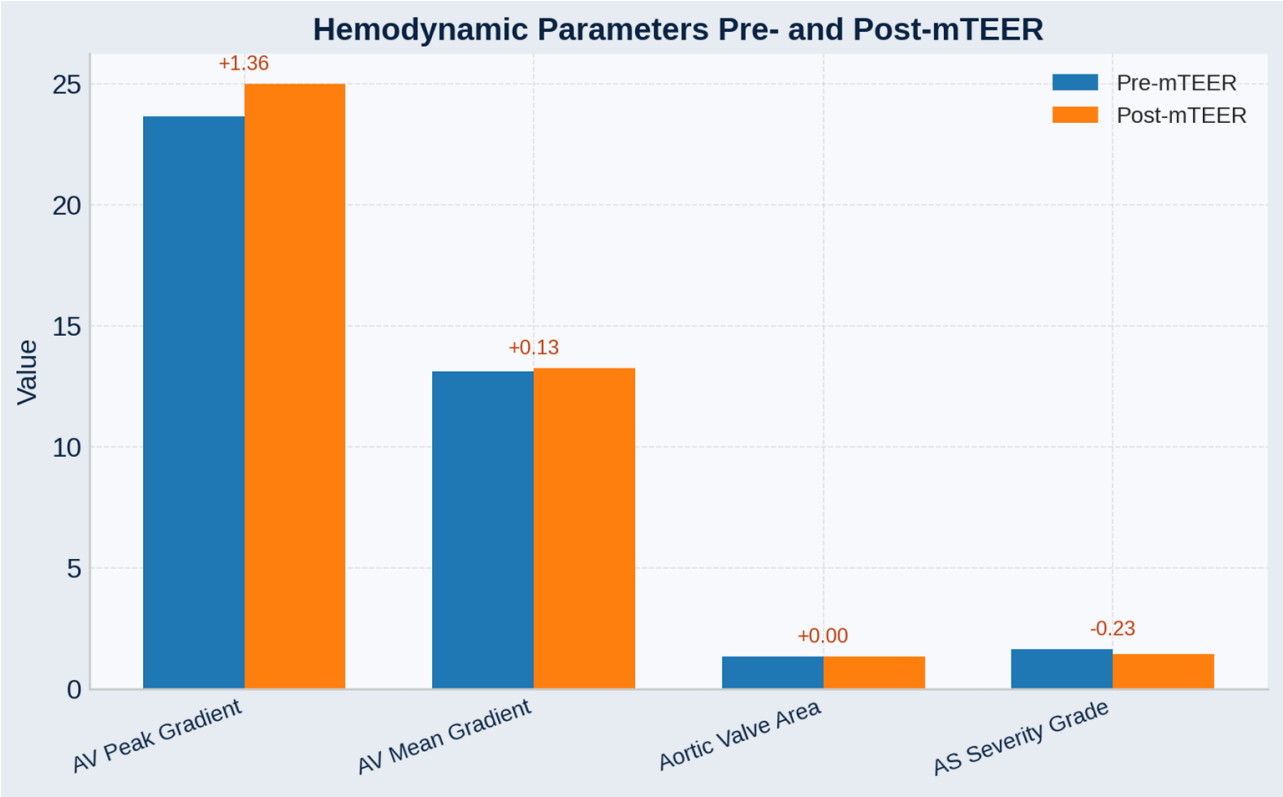
Moderate AS Patients that underwent mTEER

	Pre-	Post-	*Delta*
AVA	1.34 cm	1.67 cm	+0.32
LVOT VTI	18.0 cm	21.2 cm	+3.2
AV VTI	47.1 cm	49.8 cm	+2.7
AV mean gradient	13 mmHg	14 mmHg	+1
AV peak gradient	23 mmHg	25 mmHg	+2

Peak AV gradient change > 10 mmHg: 9 patients

Mean AV gradient change > 10 mm Hg: 1 patient

Changes in Aortic Valve Parameters post mTEER



Interpretation

Small change in Aortic gradients

Reflect change in forward flow

Minimal change in AV area

AVA stability suggests valve orifice didn't change

No overall change in Aortic Stenosis Classification

Given pre and post TTE similarities, AS severity change likely not clinically significant for most patients

Reassessing AS after mTEER

- Repeat TTE post mTEER provides more accurate AS assessment
- Highlights importance of sequential, not simultaneous, valve intervention for transcatheter therapies
- Multimodality imaging more helpful (i.e.- CT/TEE) to determine aortic severity in pts with concomitant severe MR and low gradients

Next Steps

- Limitations: retrospective design in a single center study
- Patients that underwent m-TEER were more likely to have less severe AS
  - when operators felt that it was a LFLG AS, perhaps that swayed them to perform TAVR first)
- Ongoing subgroup analysis:
  - predictors of significant gradient changes
  - impact on long term outcome and TAVR timing (moderate AS with severe MR)

Summary

- Although not statistically significant, mTEER in patients with severe MR and moderate AS causes small but measurable aortic gradient changes
- re-evaluation of AS after mTEER is essential for accurate diagnosis and intervention timing
- **Previous notion that abolishment of MR would significantly increase AV gradients may not be accurate**

Thank you!

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