

Follow up after TAVI

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11th June 2018
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What's in a name?



TAVR Centre...

- Territorial Auxiliary and Volunteer Reserve Association

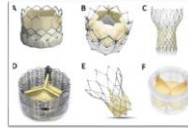
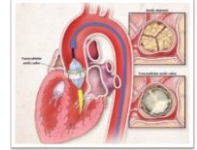


Do you echo patients after TAVI?

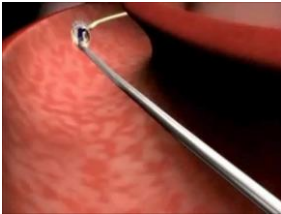
1. Regularly
2. Occasionally
3. Will start soon
4. Never

Are TAVI valves different then?

- Different haemodynamics
- Valve 'wedged' inside native valve – regurgitation more common



TAVI valve implantation



When to echo post TAVI

- Pre-discharge for transfemoral (delay to ~ 30 days for transapical)
- 3 months
- 1 year then annual assessment

TAVI outcome definitions

European Heart Journal (2017) 38, 2403–2418
doi:10.1093/eurheartj/ehw225

FASTTRACK CLINICAL

Updated standardized endpoint definitions for transcatheter aortic valve implantation: the Valve Academic Research Consortium-2 consensus document*

A. Pieter Kappetein¹, Stuart J. Head, Philippe Génèreux, Nicolo Piazza, Nicolas M. van Mieghem, Eugene H. Blackstone, Thomas G. Brodt, David J. Cohen, Donald E. Cutlip, Gerrit-Anne van Es, Rebecca T. Hahn, Ajay J. Kirtane, Mitchell W. Kruskal, Susheel Kodali, Michael J. Mack, Roxana Mehran, Josep Rodés-Cabau, Pascal Vranckx, John G. Webb, Stephan Windecker, Patrick W. Serruys, and Martin B. Leon

Source: University Medical Center, PO Box 2450, 3000 CA Rotterdam, The Netherlands
Received 28 June 2017; revised 28 July 2017; accepted 28 July 2017

Design differences

Bioprosthetic valves



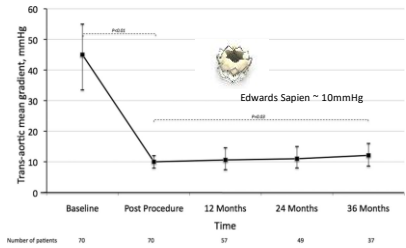
Transcatheter valves



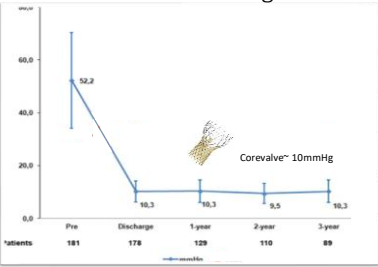
What to assess post TAVI

- Gradients across valve
- Effective Orifice Area
- Regurgitation
- Valve appearance and position

What should the mean gradient be?



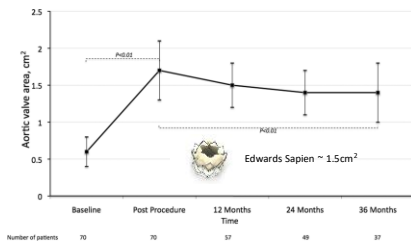
What should the mean gradient be?



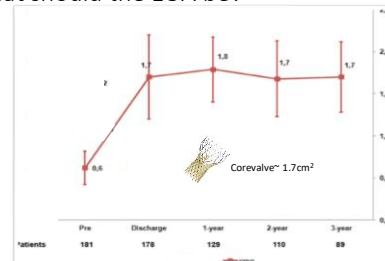
What to assess post TAVI

- Gradients across valve
- Effective Orifice Area
- Regurgitation
- Valve appearance and position

What should the EOA be?



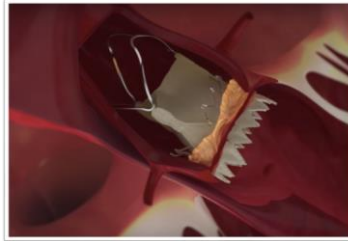
What should the EOA be?



Measure EOA accurately



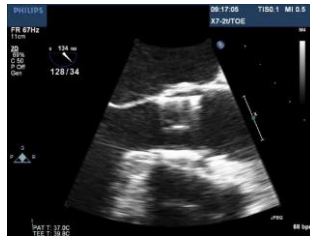
Boston Acurate Neo supra-annular valve



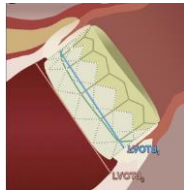
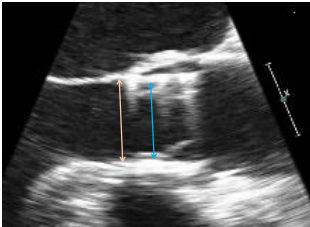
Measure EOA accurately



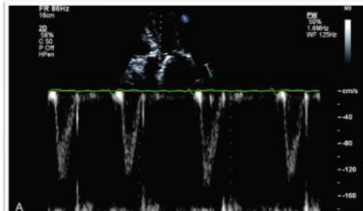
Measure EOA accurately



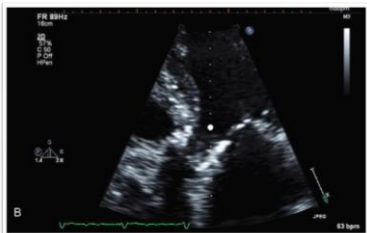
Measure EOA accurately



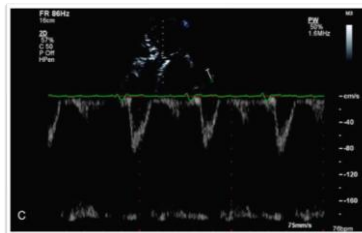
Would you measure this LVOT VTI?



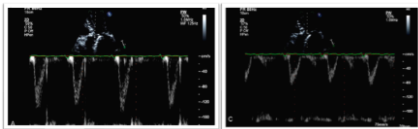
Measure EOA accurately



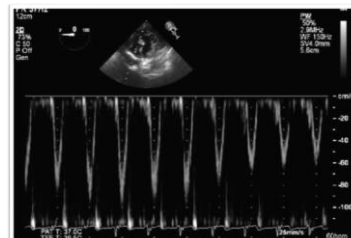
Measure EOA accurately



Measure EOA accurately



Measure EOA accurately



How much difference?

Table 3 Flow characteristics of the transcatheter heart valve on the basis of pre-stent versus in-stent precusp "subvalvular" sample volume position ($n = 40$)

Variable	Sample volume pre-stent*	Sample volume in-stent precusp [†]	P
V_{max} (m/sec)	1.0 ± 0.2	1.5 ± 0.2	<.0001
VTI _v (cm)	21.5 ± 5.5	30.5 ± 7.1	<.0001
DVI	0.48 ± 0.12	0.73 ± 0.13	<.0001
EOA (cm ²)	1.79 ± 0.34	2.54 ± 0.46	<.0001
Indexed stroke volume (mL/m ²)	44.7 ± 11.7	64.0 ± 16.2	<.0001

Further reading

Editorial Comment

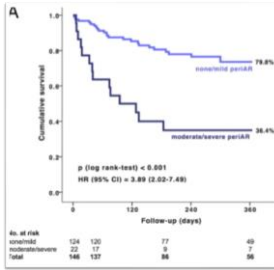
Echocardiography Derived Valve Area of the Edwards SAPIEN Aortic Valve Prosthesis: New Methodology is Required to Comply with Old Hemodynamic Principles

Fletcher A. Miller, Jr., MD, FACC, FASE, Rochester, Minnesota

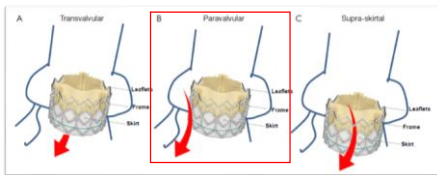
What to assess post TAVI

- Gradients across valve
- Effective Orifice Area
- **Regurgitation**
- Valve appearance and position

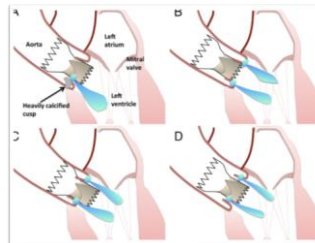
Does AR matter?



Why does it happen?



Why does paravalvular regurgitation occur?



- A. Calcification \downarrow expansion
- B. High implant
- C. Low implant
- D. Undersized valve

Why is it a challenge?

- Multiple small jets
- Eccentric and irregular
- Acoustic shadowing
- No validated technique

Journal of Intensive Care Medicine 2018; 33(1): 1-10

Assessment of Paravalvular Regurgitation Following TAVR

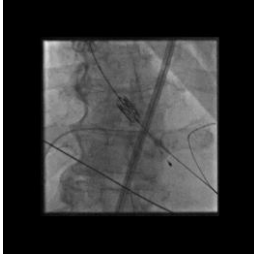
A Proposal of Unifying Grading Scheme

Abstract
Paravalvular regurgitation (PVR) is a frequent complication of transcatheter aortic valve replacement that has been shown to be associated with increased mortality. The objective of this article is to review the most up-to-date information about the assessment and management of PVR and to propose a new leak comprehensive and unified scheme for grading PVR severity. A multidisciplinary, multidimensional, integrative scheme including structural, intracardiac, hemodynamic, hemodynamic, anatomic, and/or cardiac magnetic resonance is proposed to accurately assess the severity of PVR and the underlying etiology. Consistent standards exist in before post-dilation, valve mal- or non-occlusion may be considered, depending on the severity, location, and timing of PVR. © 2017 Wolters Kluwer Health | Lippincott Williams & Wilkins

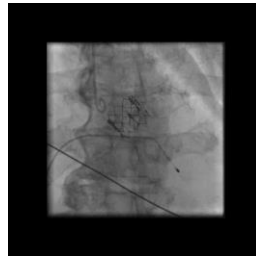
Mild paravalvular leak



Valve deployment



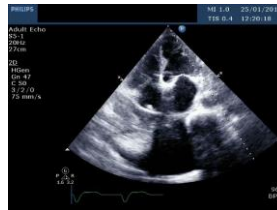
Contrast aortography



Severe paravalvular leak



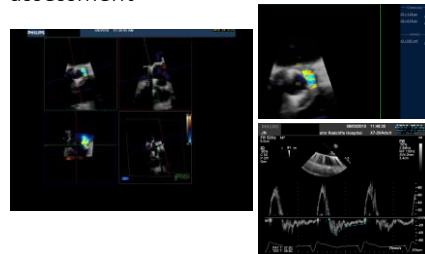
Severe paravalvular leak



1. Mild 2. Moderate 3. Severe




3D assessment



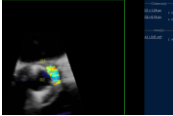
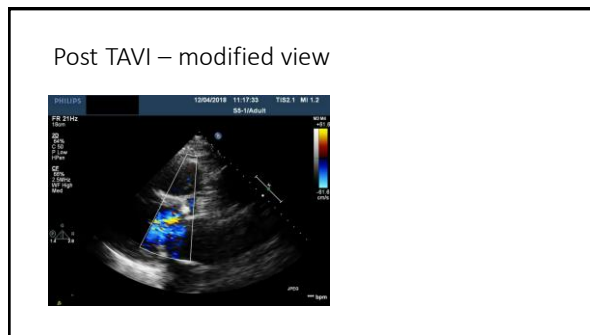
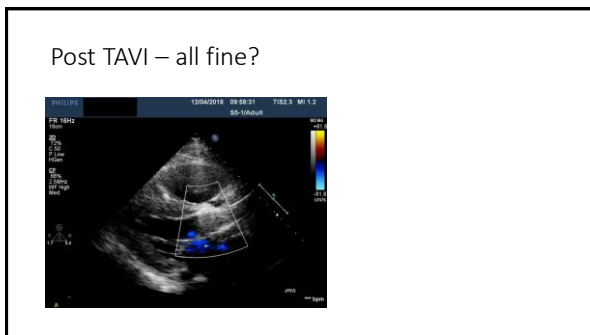
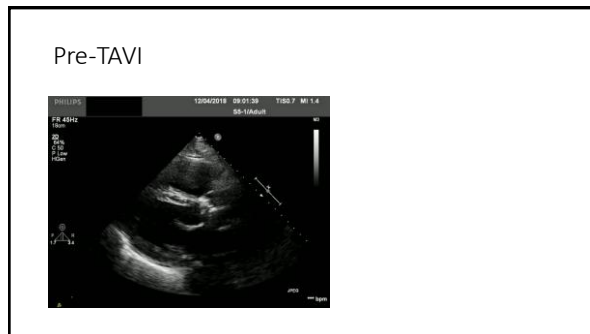
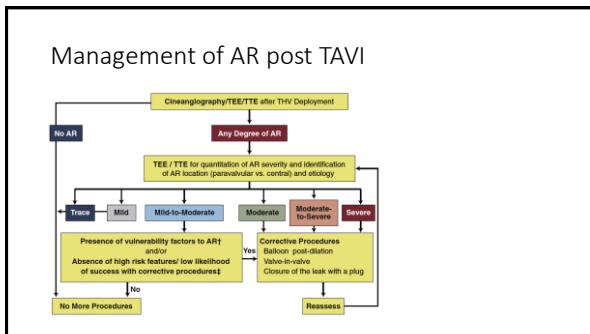
Circumference involvement

- Mild < 10%
- Moderate 10-20%
- Severe > 20%



Maximum dimension

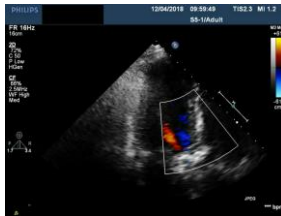
- Mild < 0.5cm
- Moderate 0.5 - 1.0cm
- Severe > 1.0cm

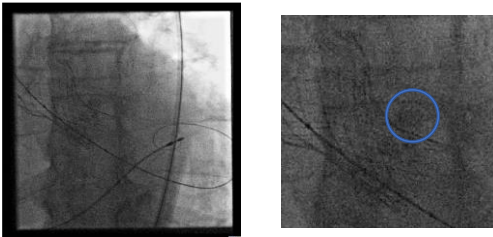
Post TAVI 3 chamber



Post TAVI 3 chamber colour flow



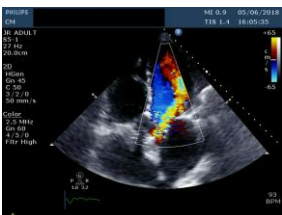
Post dilation of Corevalve



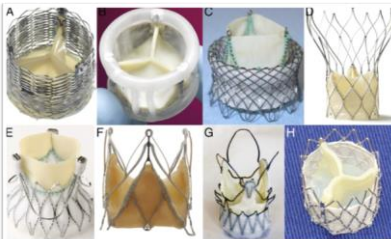
Post dilation of Corevalve



Result 3 months later...

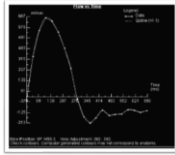
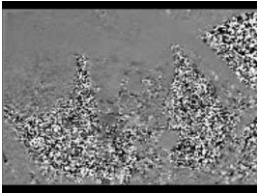


Future developments of TAVI devices



Webb J. JACC 2012;60:483-492

Future developments?



Summary

- Assess as for any prosthetic valve
- Measure EOA carefully
- Evaluate AR – it is important
- Know the valve you are assessing

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'Let's show Theresa May how easy it is to leave a group of 32 countries by a set date'