3D Echo Use in TAVR

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Valves Undergoing Early Evaluation

(A) Lotus (Boston Scientific Inc., Natick, Massachusetts), (B) Direct Flow (Direct Flow Medical Inc., Santa Rosa, California), (C) HLT (Bracco Inc., Princeton, New Jersey), (D) Portico (St. Jude Medical Inc., St. Paul, Minnesota), (E) Engager (Medtronic Inc., Minneapolis, Minnesota), (F) JenaClip (JenaValve Inc., Munich, Germany), and (H) Inovare (Braile Biomedica Inc., São José do Rio Preto, Brazil) valves.

Currently Available Transcatheter Valves

(A) The Edwards SAPIEN THV balloon-expandable valve incorporates a stainless steel frame, bovine pericardial leaflets, and a fabric sealing cuff. (B) The SAPIEN XT THV utilizes a cobalt chromium alloy frame and is compatible with lower profile delivery catheters. (C) The Medtronic CoreValve incorporates a self-expandable frame, porcine pericardial leaflets, and a pericardial seal.

Trans-femoral TAVR

Trans-apical TAVR
Edwards-SAPIEN Transcatheter Heart Valve (Edwards Lifesciences)

Medtronic CoreValveTM (Medtronic).

Feasability

Clinical Outcomes

Partner I Trial
Two-year with 1-year landmark analysis of all-cause mortality Kaplan–Meier curve in PARTNER trial cohort 1B


Two-year time trends in haemodynamics after TAVI vs. SAVR


Longitudinal section through LV, LA and Aorta


Aortic Valve Complex

TAVR Qualifiers

- High risk or inoperable patients with severe symptomatic aortic stenosis
  - Trileaflet valve
  - Mean gradient 40 mmHg
  - Peak trans aortic velocity of 4m/sec
- The patient’s aortic root and blood vessels are of appropriate size for the TAVR procedure.

Aortic Valve

Normal

Stenotic
Severe Trileaflet Calcific Aortic Stenosis

Annular Dimensions

Step By Step TAVR TEE Guidance

Pre Procedure

Transgastric TEE Aortic Stenosis Severity and Degree of Aortic Insufficiency
Aortic Complex Measurements


Aortic Complex Measurements 3D X Plane


TEE 2D and Color

LV Function

Trileaflet valve

2D Color

MR

AI LMT

3D TEE Aortic Complex Characterization

Long Axis

Short Axis

3D TEE Multiplane Reconstruction

Annular Dimensions

Sagittal Plane

Long Axis

Annulus 3D Short Axis

Pre Procedure Sagittal Plane Long Axis

Annulus 3D Short Axis

Salcedo, Ernesto, MD 3D Echo Use in TAVR
**Intra Procedure**

**Wire and Catheter Guidance**
Trans Apical TAVR

- Finding the Apex
- Wire Through AV

**Balloon Valvuloplasty**

**Intra Procedure**

**Prosthesis Positioning and Deployment**

**Post Procedure**

**Search for AI**

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**Post Procedure**

**Immediately Post TAVR Deployment**

1. Positioning, 2. Stability, 3. Leaflet excursion

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**Post TAVR**

TG 2D TEE

TG Color

V1

V2
Conclusions

- 2D and 3D TEE play a central role during TAVR procedures
- Pre Procedure:
  - Characterization of aortic complex, determination of AS severity, identification of contraindications
- Intra Procedure:
  - Catheter and device guidance, AVR deployment
- Post Procedure:
  - Valve position stability and function, AI, complications