Imaging Tips and Tricks During Transcatheter Mitral Valve Repair

Rebecca T. Hahn, MD, FACC, FASE
Professor of Medicine at CUMC
Director of Interventional Echocardiography
Columbia University
Disclosures

- **Speaker**
  - Baylis
  - Boston Scientific
  - Edwards Lifescience
  - Medtronic

- **Consultant**
  - Abbott Vascular
  - Edwards Lifescience
  - Medtronic
  - 3Mensio
  - Navigate

- **Core Lab Director for multiple Valve Trials**
  - Receive no direct compensation
Baseline Imaging: Characterization of Valve Morphology

Flail width in 3D TEE - enface view

Flail width in 2D TEE - intercommissural view

Flail gap in 2D TEE - LVOT view

Clefts

Deep Folds

Severe Calcification / Small Valve Area

MVOA = 3.7 cm²
Baseline Imaging: Characterization of MR Jet

Characterization of MR jet:
- MR jet location / direction
- MR jet number
- MR severity
  - 3D color Doppler vena contracta area
1. Systolic flow reversal in right and left pulmonary veins

2. Peak / mean diastolic gradients = 4 and 1 mmHg

3. LVOT Stroke Volume = 60 cc

4. PASP = 36 mmHg (mean PAP = 24 mmHg)
Steps to PASCAL Repair System Deployment

1. Trans-septal Puncture
2. Advancing the Delivery System
3. Position and Orientation of the Implant
4. Positioning Below the Leaflets
5. Clasping the Leaflets
6. Post-Delivery Assessment: Position, MVOA / Gradient, EROA
Trans-septal Puncture

Trans-septal Height = 4.5 cm.
Set the Implant in Closed position
Position Implant, Set Implant in Capture-Ready Position, Orient

- Independent catheter controls allow pure adjustment of position and trajectory
- 3D Imaging (in “surgical view”) is key to orienting the implant
Identify Anterior and Posterior Clasps

- **Independent:**
  - Determine which slider controls which clasp

- **Simultaneous:**
  - Determine the correct angle on LVOT view, able to image both clasps
Re-position and Orient the Implant

Reduce 3D gains to visualize paddle orientation below the leaflets
Retract the implant until leaflets are laying on Inner Paddles
Dropping clasps and verifying leaflet insertion: clasp bounce
Confirm position and orientation of the implant

Close the implant with color Doppler
Hypermobile posterior leaflet

Raise posterior clasp and torque towards posterior leaflet

Re-clasping of posterior leaflet
After guide sheath removal:

1. Assess interatrial shunt for size and direction of flow
2. Check for pericardial effusion
Post-Delivery: Position, MVOA / Gradient, EROA

- **Mitral Valve Area**
  - Peak and Mean Gradients
  - Planimetry of Orifice by 2D (transgastric view) or 3D MPR

- **Mitral Regurgitation**
  - Qualitative Assessment
    - Jet area, jet density
    - 2D Vena contracta
    - Change in pulmonary vein systolic flow
  - Quantitative Assessment
    - Planimetry of VCA by 3D MPR
    - Relative Stroke Volumes
Summary - PASCAL Repair System

1. Easy gain of height for trans-septal puncture
2. Simple and easy to handle advancing of the delivery system
3. Simple position and orientation of the implant
4. Straightforward positioning below the leaflets
5. Clasping the leaflets – independent clasp control favours leaflet capture optimization
6. Elongated position favours safety – designed for safety
7. Relevance of pre and post-delivery assessment: Position, MVOA / Gradient, EROA
Thank You

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Repositioning the Implant

- Smallest implant profile to reduce risk of entanglement

Repositioning in the Atrium

1. Retract the implant back into the Atrium
2. Set the implant in elongated position
3. Interaction with chordae
4. Repositioning in the ventricle