Intraoperative Echo: Decision Making in Mitral Valve Disease

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Disclosures

• None
Important Information Needed from the Echo

- **Pre-op**
  - What is the mechanism of the valve disorder
  - How severe is the valve lesion
  - What are the other abnormalities in the heart

- **Post-op (in the OR)**
  - Is there residual regurgitation?
  - Is there unacceptable stenosis?
  - Is there SAM?
  - How is the LV? How is the RV?
Mitral Valve Anatomy

Carpentier Classification

Type I

Type II

Type III
Mitral Valve Anatomy
TEE of the Mitral Valve

• Identification of disease mechanism
• Identification of prolapsing/flail segments
• Extent/direction of MR jets
• Identification of additional pathology

Illustration of traditional 2D and novel 3D echocardiography

(a) energy beam formed from the conventional ultrasound crystal array
(b) energy beam formed from the new crystal array
(c) the resulting 3D pyramid of data can be examined in short-axis (plane C) or in long-axis (plane B)
Type I Mitral Regurgitation

Controls (unpublished)

- DAIPm1 = 25.7 (16 - 39)
- DAP = 34.8 (24 - 51)
- C3D = 130.9 (89 - 168)
- C2D = 127.2 (87 - 164)
- A2D = 1231.3 (555 - 2003)

Courtesy of Nausheen Akhter, MD
Type II MR: Definition of MVP

MVP: Prolapse > 2mm beyond annulus during systole

Leaflet Thickness: ≥ 5 mm during diastole

Barlow’s Valve
Fibroelastic Dysplasia
Type 3a Mitral Regurgitation/
Mitral Stenosis
Type 3b Mitral Regurgitation
Feasibility of Real Time 3D TEE

Percent “Excellent” visualization

» MV: 85-91%
» IAS: 84%
» LAA: 86%
» LV: 77%
» AV: 18%
» TV: 11%

Sugeng L et al. J Am Coll Cardiol 2008;52:446-9
Identification of MV Scallops Using 3D TEE
New Findings Using 3D TEE for Valve Surgery

Abraham TP et al. Am J Cardiol 1997;80:1577-1582

<table>
<thead>
<tr>
<th>Valvular Morphologic Abnormality</th>
<th>New 3-D Findings (no. of pts.)</th>
<th>2-D</th>
<th>3-D</th>
<th>Surgical</th>
<th>Pathologic</th>
<th>New 3-D Findings</th>
<th>False Positive</th>
<th>False Negative</th>
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<tbody>
<tr>
<td>Fenestration</td>
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<td>9</td>
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<td>7</td>
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<td>8 (pathology)</td>
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<td>Bicuspid aortic valve</td>
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Pre-op TEE
Pre-op TEE
3D Color
Coming of Bypass

• RV and LV function
• SAM
• MR
• MS
MV Measurements

- Annulus – 4.0 cm
- PL = 2.3 cm
- AL = 2.3 cm
- Csept = 2.1 cm

Maslow AD et al. J Am Coll Cardiol 1999;34(7):2096-104

AL/PL ≤ 1.3
C-sept ≤ 2.5 cm
After Fluids and Reducing Pressers

POSTOP
BP = 146/74
Preop
VC=0.5 cm
EROA = 0.76 cm²
FR 18Hz
12cm

Full Volume
3D 30%
3D 40dB
CF
50%
4.4MHz

preop
bp=132/76
Post-op
Post-op

postop
bp=98/63
Late Complications
History

- 78yo s/p MV repair 3 mo prior (at OSH) using Annuloplasty band
- Post-op: Acute renal failure
- Now presents with VRE bacteremia likely 2/2 catheter-related blood stream infection with infected vas cath
History

- 56 yr old male s/p MV repair 6 yrs prior
- h/o MV prolapse
- He presents with SOB
Summary

• *Echo is an invaluable tool to assist in the management of pts with mitral valve disease*

• *TEE provides comprehensive assessment of anatomy, mechanism of disease and hemodynamic information*

• *2D and 3D TEE combined provide the most comprehensive information*
Thank You