MitraClip Cases

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DISCLOSURE

Relevant Financial Relationship(s)
None

Off Label Usage
None
Case 1

- 86 year old female
- Acute onset dyspnea from pulmonary edema
- History of prior CABG
- CKD (creatinine 2.0 mg/dl)
- Paroxysmal atrial fibrillation
- Physical exam
  - 3/6 holosystolic murmur
- TTE
  - Flail MV with severe mitral regurgitation
  - LV EF 60%
EKG

- Catheterization: Patent Grafts
TEE: Flail MV Posterior Leaflet

A1-P1/lateral portion of P2
TEE

A2-medial portion P2

A3-P3
TEE: Commissural View
TEE
Mitral Valve

- Mean Gradient 5 mmHg at HR of 88 BPM
- Valve area >4.0 cm²
Heart Team Discussion

- CV Surgery, Valve/Imaging Specialist, and Structural Interventionalist
  - Decision made to proceed with MitraClip
Procedural TEE: Flail P2 (Lateral Portion)
Transeptal Puncture
Sheath in Left Atrium
MitraClip Device in Left Atrium
MitraClip Device Toward MV
Heading Toward Valve
Importance of Clip Orientation

Wrong

Correct
Grasping MV
MV Grasped
MV Grasped
Final Result: Mild MR

Mean Gradient 5 at HR 77 BPM
Final 3D Images
Pre-clip

45 mmHg

Post-clip

15 mmHg

Left Atrial “V” wave Tracings
Atrial Septum: Small ASD
Pre-discharge TTE: Mild MR

→ Mean Gradient 3 at HR 59 BPM
Outcome

- Patient discharged home 4 days post-procedure
- Dyspnea markedly improved
- Continues to do well 18 months post-procedure
Case #2

- 81 year old male with PMH of 3 vessel CABG 20 years prior
  - Inferior MI 2 years ago → PCI to RCA SVG
  - Recent Patent SVG to OM1, patent LIMA to LAD, and patent RCA
- LV EF 51 %
  - inferior regional wall motion abnormality
- Severe “functional” mitral regurgitation
- Progressive dyspnea over last 1 year
  - NYHA class III
TTE

ERO (PISA); 0.39 cm²
Regurgitant volume (PISA); 57 cc
81 year old with severe ischemic (functional) MR

- Recurrent hospitalizations despite optimal medical therapy
  - Quality of life diminishing
- Multidisciplinary Heart Team Evaluation
- Discussion with patient
  - MitraClip
Procedural TEE
Procedural TEE
Procedural TEE
Procedural TEE
Procedural TEE
3D Color Doppler

LA View

LV View
No Mitral Stenosis
Transeptal Puncture

3.85 cm
Device Across Atrial Septum
Guiding Toward MV
MV Grasped
Color with MV Grasped
3D Color with MV Grasped
Decision Made to Place 2\textsuperscript{nd} MitraClip
2\textsuperscript{nd} MitraClip in Place with Grasped MV Leaflets
2\textsuperscript{nd} MitraClip with Grasped MV Leaflets → Improved MR
Gradient after 2\textsuperscript{nd} Clip

- V\textsubscript{max} 193 cm/s
- V\text{mean} 105 cm/s
- Max PG 15 mmHg
- Mean PG 5 mmHg
- VTI 57.4 cm
Small ASD Post-Procedure
Outcome

• Patient extubated
• Much less dyspnea 1 day later
• Discharge to home
1 Month Follow-up TTE

Final Impressions
1. Clinical MitraClip Transcatheter Mitral Valve Repair (TMVR)
2. Mitral valve diastolic mean Doppler gradient; 6 mmHg (heart rate 60 BPM).
3. Mild mitral valve regurgitation, central jet originating between the two clips. ERO 0.12 cm2 RVol 21 mL

SIX-MINUTE WALK DATA
Total time walked: 6 minutes
Total distance walked: 1400 feet; 426.7 meters, which is 99% for age and gender.
Rest Stops: No
O2 usage: None
Case #3

89 year old man with dyspnea

- Very active (digs potatoes) but gets quite short of breath
- Flail mitral leaflet noted 1.5 years prior
- Past History:
  - HTN
  - CKD stage 4 (Cr 2.0)
  - Depression
  - OSA on CPAP
  - Anemia of chronic disease
  - Spinal stenosis s/p surgery
89 year old man with dyspnea

- 1.5 years ago: exertional dyspnea and chest discomfort
- LVEDD: 60mm, LVESD: 35 mm
- EF: 69%, RVSP 57 mmHg
- Flail posterior leaflet w/severe MR
- Conservative management recommended to avoid surgery
89 year old man with dyspnea

• Physical Examination:
  – HR 49, BP 126/78, BMI 36
  – Normal JVP
  – Decreased breath sounds in bases
  – Laterally displaced PMI, 3/6 blowing holosystolic murmur at apex
  – Abdomen soft, nondistended, no hepatomegaly
  – 2+ bilateral lower extremity pitting edema

• Laboratory Data:
  – Hgb 9.4
  – Cr 1.9
  – NT pro BNP 5681
89 year old man with dyspnea
Transthoracic Echocardiogram
Severe Eccentric MR
TEE: Flail P2
89 year old man with dyspnea

- 6 minute walk: 213 m, 65% predicted
- STS risk 6.7% repair, 8.5% replacement
- Not Frail
- CV Surgery: high risk
- Heart Team Discussion
  - MitraClip Recommended
TEE-guided Transseptal
Leaflets Grasped
MitraClip Deployed: Mild Residual MR
3D Color TEE: Single Beat

- Lens Temp: 38.3°C
- 11 vps / 90 mm
- 47 bpm / General
- 4.5 MHz
- -2 dB
- DR: 61 dB
- CDV / 3.3 MHz
- 1 dB

Image showing 3D Color TEE with various parameters and measurements.
Small Residual ASD
89 year old man with dyspnea

- Postprocedure:
  - Extubated uneventfully
  - Discharged to home the next day
89 year old man with dyspnea

Baseline

30 day f/u
Case #3
89 year old man with dyspnea

- 30 day follow-up: dyspnea resolved
- 6 min walk: 277 m, 83% predicted
- Participating in cardiac rehab
- TTE: LVEDD 57mm, LVESD 37 mm
- EF: 68%
- RVSP: 56 mmHg
- NT pro BNP 1714
Follow-up TTE
Follow-up TTE
Follow-up TTE: Mild MR
Thank You!
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Backup Slides
Percutaneous Mitral Repair With the MitraClip System

Safety and Midterm Durability in the Initial EVEREST (Endovascular Valve Edge-to-Edge REpair Study) Cohort

Ted Feldman, MD,* Saibal Kar, MD,† Michael Rinaldi, MD,‡ Peter Fail, MD,§ James Hermiller, MD,¶ Richard Smalling, MD, PhD,‖ Patrick L. Whitlow, MD,# William Gray, MD,** Reginald Low, MD,†† Howard C. Herrmann, MD,‡‡ Scott Lim, MD,§§ Elyse Foster, MD,|| Donald Glower, MD,¶¶ for the EVEREST Investigators

Evanston, Illinois; Los Angeles, Sacramento, and San Francisco, California; Charlotte and Durham, North Carolina; Houma, Louisiana; Indianapolis, Indiana; Houston, Texas; Cleveland, Ohio; New York, New York; Philadelphia, Pennsylvania; and Charlottesville, Virginia
Beigel R...Siegel RJ, MD. J Am Coll Cardiol 2014;64:2688–700
(Images provided courtesy of Abbott Vascular © 2014. All rights reserved.)
3-D Navigation System

Loosen

Torque
EVEREST II Trial 4 Year Results

- No difference in 3-4+ MR
- No difference in death or repeat surgery

Recommendations

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<th>Recommendations</th>
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<td>Percutaneous MV repair may be considered for severely symptomatic patients (NYHA class III-IV) with chronic severe primary MR (stage D) who have a reasonable life expectancy, but a prohibitive surgical risk because of severe comorbidities</td>
<td>IIb</td>
<td>B</td>
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Nishimura RA et al. JACC 2014; 63:e57-e185.
TVT Outcomes
N = 564

- Procedure success .... 91.8%
- Complications .......... 7.8%
- Length-of-stay .......... 3 d (1.6 d)
- Home discharge ........ 81.9%

Adverse Events

- In-hospital mortality: 2.3%
- 30-day mortality: 5.8%
- Cardiac surgery: 0.5%
- Stroke: 1.8%
- Myocardial infarction: 0%
- Major bleeding: 3.9%
- Cardiac perforation: 0.7%
- Device-related events: 2.7%
- Single leaflet device attachment: 1.1%
- Device embolization: 0.4%
- Other: 1.2%

Change in Mitral Regurgitation

Clip implantation occurred in 94%

- 93% MR ≤2
- 63.7% MR≤1

p<0.001

Transseptal Puncture
Imaging: Bi-caval, X-Plane

• Pull-Back Technique
Transseptal Puncture Imaging: 4-Chamber or 5 Chamber

3.5 - 4.0 cm
Transseptal Puncture
Short Axis at the Base → Posterior Direction

LA
AO
RA
Transeptal Puncture by 3D Echocardiography
Trans-septal Puncture
Grasping → Imaging: LVOT
Flail Gap and Width

3D TEE

LA
LV

3D TEE

PHILIPS
12/13/2007 10:02:43AM TIS0.3 MI 0.5 X7-2u/Adult

X-ray volumes 0 120 190
406B
Coaptation Length

Distance = 0.59 cm
Large Atrial Shunt
→ ASD Occluder Placed