Heart Failure and the Mitral Valve

Heart Team Approach

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Goals of Discussion

Intersection of Valve and Heart Failure Teams

Understand the role of the mitral valve in heart failure
Mitral Stenosis
  - Rheumatic
  - Mitral Annular Calcification
Mitral Regurgitation
  - Primary
  - Secondary

Treatment options for advanced mitral valve disease
  - Surgical
  - Transcatheter
  - LVAD
  - Heart Transplant

Mitral Stenosis

Rheumatic mitral stenosis

Percutaneous mitral balloon commissurotomy (PMBC)
  - Should be performed only by experienced operators, with immediate availability of surgical backup for potential complications
  - Long-term follow-up has shown 70% to 80% of patients with an initial good result after PMBC to be free of recurrent symptoms at 10 years, and 30% to 40% are free of recurrent symptoms at 20 years
  - Older patients with lower gradients (<10 mm Hg) will not have as good an outcome

Surgical valve replacement
  - Suboptimal valve anatomy (or failed PMBC)
  - Patients with moderate or severe TR may also have a better outcome with a surgical approach that includes tricuspid valve repair.

2020 ACC/AHA Guideline

Otto C et al. Circulation 2020
Mitral Stenosis

Non-Rheumatic Calcified MS

- 5-year survival rate <50%, most likely because of advanced age and other comorbidities
- These patients are at high risk with any intervention because of the extensive calcification, as well as advanced age and multiple comorbidities
- In patients with calcific MS, the indications for any intervention differ from those for rheumatic MS, and intervention for calcific MS should be performed only in the highly symptomatic patient.
- Non-rheumatic MS can also be present after radiation therapy and after a mitral valve repair with a small annuloplasty ring.

2020 ACC/AHA Guideline

<table>
<thead>
<tr>
<th>Recommendation for Nonrheumatic Calcific MS</th>
<th>CDR</th>
<th>LOE</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>1. In severely symptomatic patients (NYHA class III or IV) with severe MS (mitral valve area &lt;1.5 cm², Stage D) attributable to extensive mitral annular calcification, valve intervention may be considered only after discussion of the high procedural risk and the individual patient's preferences and values.1,3</td>
<td>2b</td>
<td>C-LD</td>
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Otto C et al. Circulation 2020
Mitral Regurgitation

Primary Mitral Regurgitation

- A mitral transcatheter edge-to-edge repair is of benefit to patients with severely symptomatic primary mitral regurgitation who are at high or prohibitive risk for surgery, as well as to a select subset of patients with secondary mitral regurgitation who remain severely symptomatic despite guideline-directed management and therapy for heart failure.

- All patients with severe valvular heart disease being considered for valve intervention should be evaluated by a multidisciplinary team, with either referral to or consultation with a Primary or Comprehensive Valve Center.

- REPAIR-MR Trial: Moderate Surgical Risk patients who are suitable for correction by MV repair surgery
  - All-cause mortality, stroke, cardiac hospitalization, AKI requiring renal replacement therapy at 2 years
  - Proportion of subjects with moderate or less MR(<1/2+), without mitral valve replacement and without recurrent mitral valve intervention

Otto C et al. Circulation 2020

Mitral Regurgitation

Chronic Secondary MR

- Goal directed medical therapy supervised by a heart failure specialist.

- Patients with an EF >50% who are symptomatic may benefit from surgery where those with an EF<50% and who meet specific anatomic requirements may benefit from edge-to-edge-repair.

Otto C et al. Circulation 2020
Mitral Regurgitation

Surgical Management of Ischemic MR

• In an RCT of mitral valve repair versus mitral valve replacement in patients with severe ischemic MR, there was no difference between repair and mitral valve replacement in survival rate or LV remodeling at 2 years. However, the rate of recurrence of moderate or severe MR over 2 years was higher in the repair group than in the replacement group, leading to a higher incidence of HF and repeat hospitalization.

• The lack of apparent benefit of valve repair over valve replacement in secondary MR versus primary MR, with less durable repairs in secondary MR, highlights that primary and secondary MR are 2 different diseases.

Two-Year Outcomes of Surgical Treatment of Severe Ischemic Mitral Regurgitation

Goldstein D, NEJM 2016
Otto C et al. Circulation 2020
Surgical vs. Transcatheter Repair for Secondary Mitral Regurgitation

- No difference in 2-year survival between SMVr and TMVr groups
- Better and more durable MR reduction and improvement of LVEF in SMVr group
- Better improvement of heart failure symptoms in SMVr group

![Graph showing survival and MR reduction](image)

Okuno, T. J Thorac and Cardiovasc Surg, 2021

LVAD Therapy and Severe Mitral Regurgitation

LVAD alone is sufficient treatment for severe secondary MR

- Significant decrease in the severity of MR after LVAD implantation
  - Severe MR 51% pre- vs 6% post-LVAD implantation ($P < 0.001$)
- Secondary severe MR is reversed at the time of LVAD implant and the findings are durable over 2 year follow-up
- Trend to improved survival among LVAD patients who have severe MR at the time of implant

![Graph showing MR severity and survival](image)

Schreiber, C et al. Artificial Organs, 2021
Dobrovie M et al. Cardio-Thorac surgery 2018
LVAD Therapy and Severe Mitral Regurgitation

LVAD alone is not sufficient for primary MR or in patients who may recover LV function

- Mitral valve repair at the time of LVAD implant may improve long term outcomes
- Right ventricular function and residual mitral regurgitation after left ventricular assist device implantation determines the incidence of right heart failure
- Mitral regurgitation can be managed with percutaneous intervention postoperatively in select cases

Survival at 2 years ~ 80%

Need Long Term Follow-up

Surgical MVR vs MVR

Durable LVAD

Heart Transplant

Moayedi Y. Circulation:Heart Failure 2019
Heart Team Approach for Every Patient

- Understand available therapies and their indications
- Match the treatment(s) to the patient
- Consider LVAD/Transplant for qualifying patients
- Follow long-term outcomes and quality of life indicators