

Primary Mitral Regurgitation: without/with Heart Failure, Age 60 years

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Mount
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Heart



MITRAL FOUNDATION

Primary Mitral Regurgitation: Surgeon's Perspective. *Five Questions to Ask*

1. How is the Valve?
2. How is the patient feeling?
3. How is the heart?
4. How is the surgeon and what is the most likely operative result?
5. Is there reasonable expectation of net benefit of surgery?

Primary Mitral Regurgitation: Surgeon's Perspective. *Five Questions to Ask*

1. How is the Valve?

- Severity
- Etiology
- Repairability

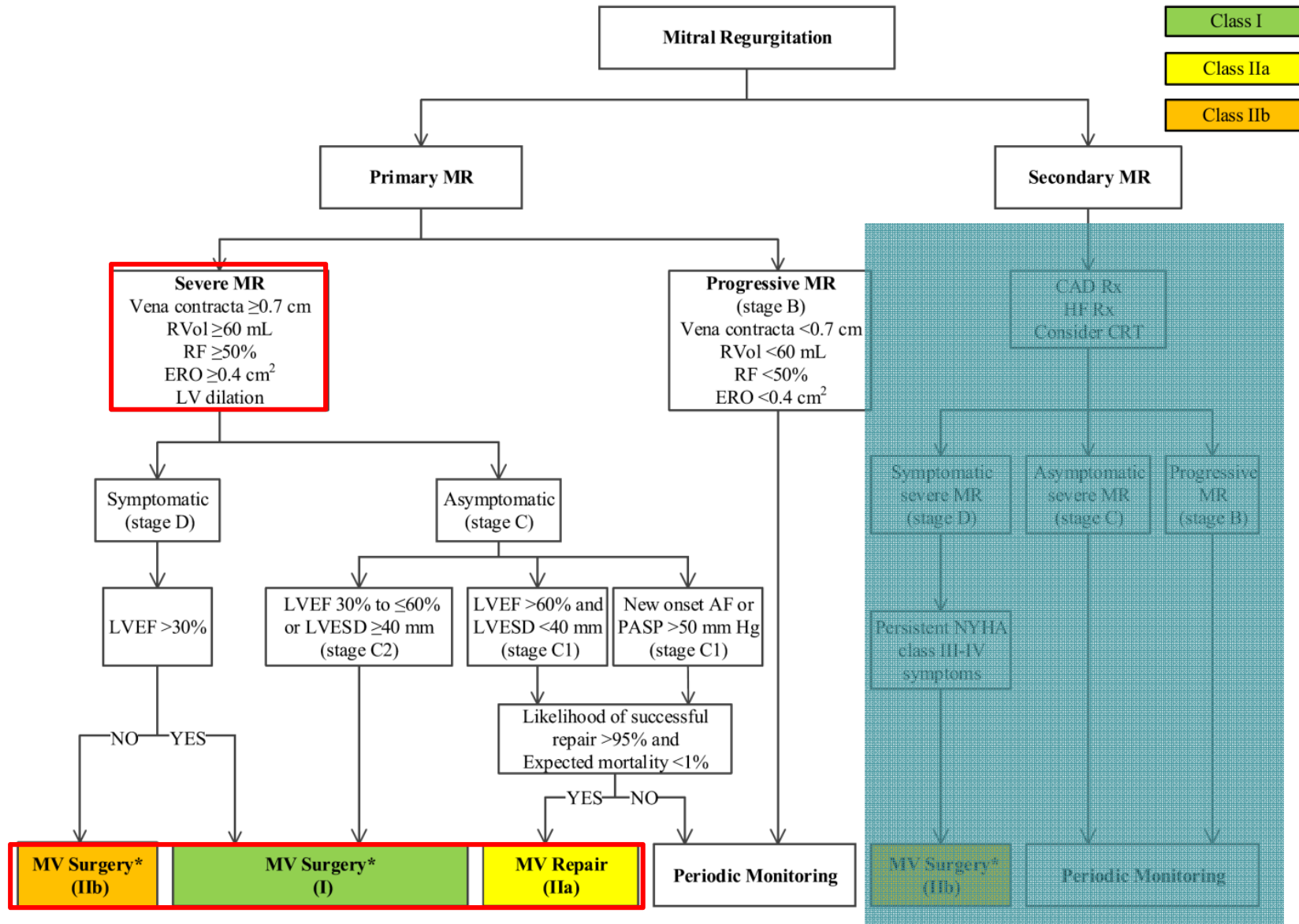


Figure 4. Indications for Surgery for MR

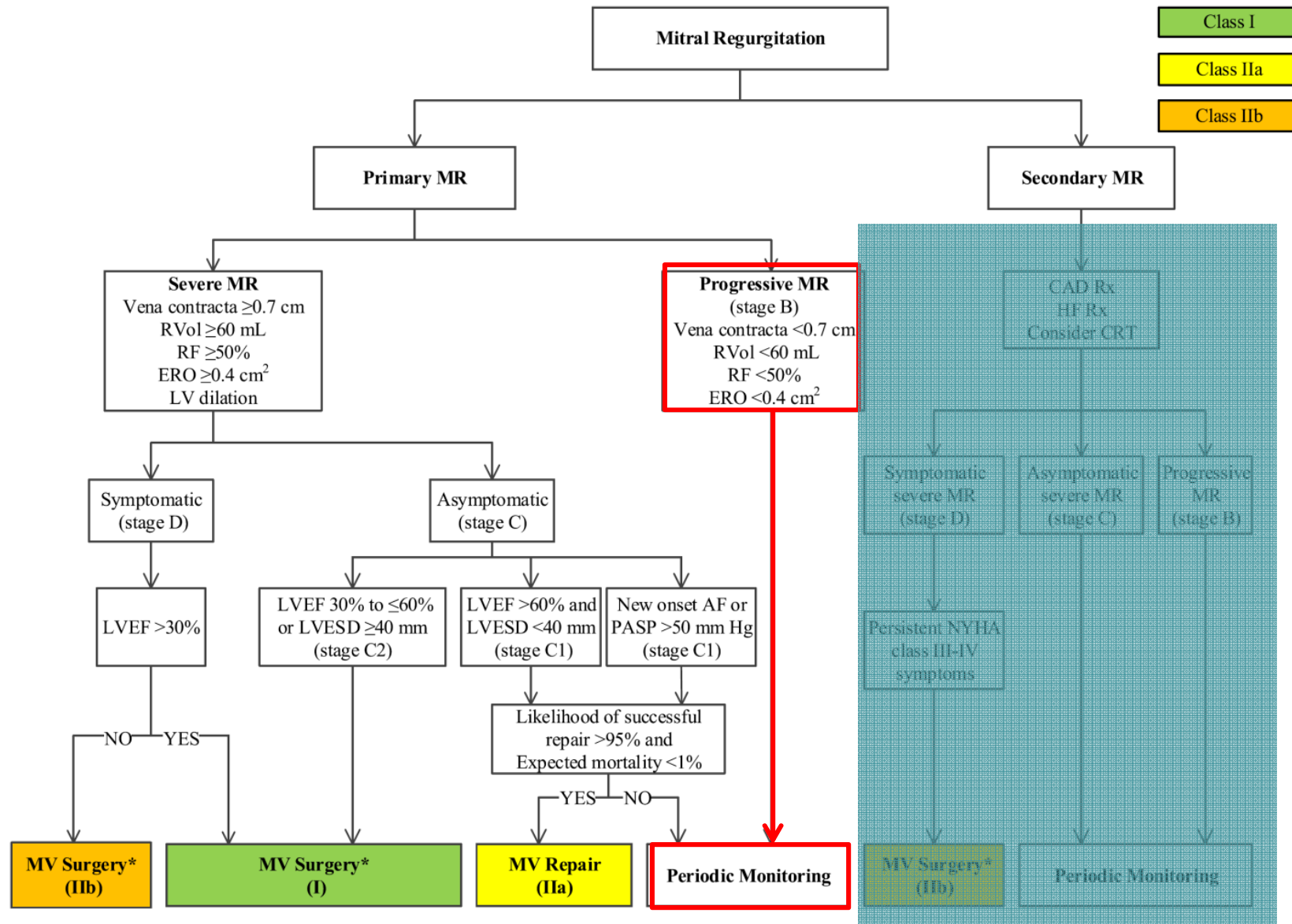


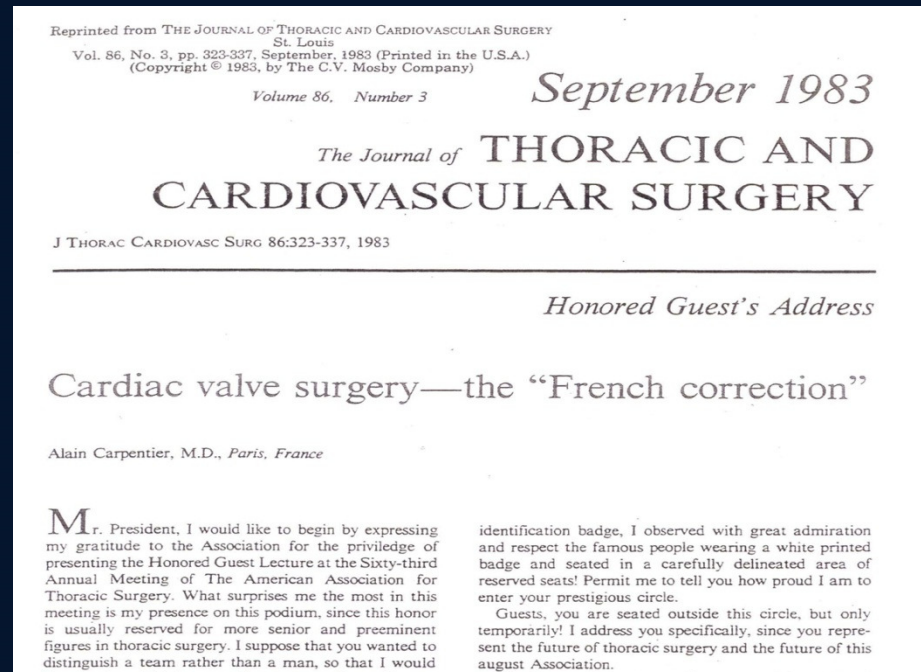
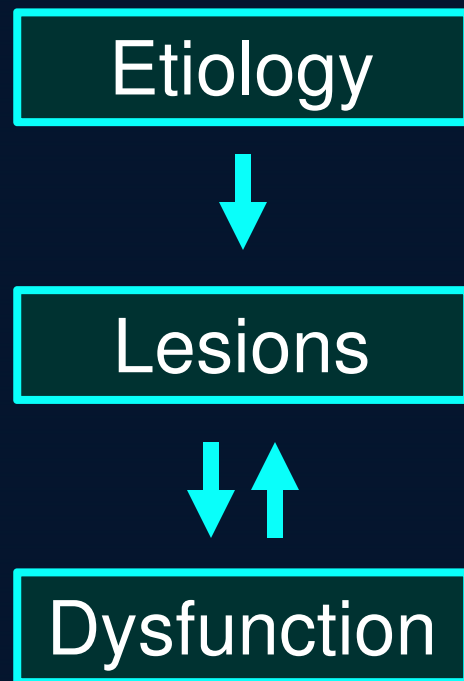
Figure 4. Indications for Surgery for MR

Severity of Mitral Regurgitation (All the surgeon wants to know)

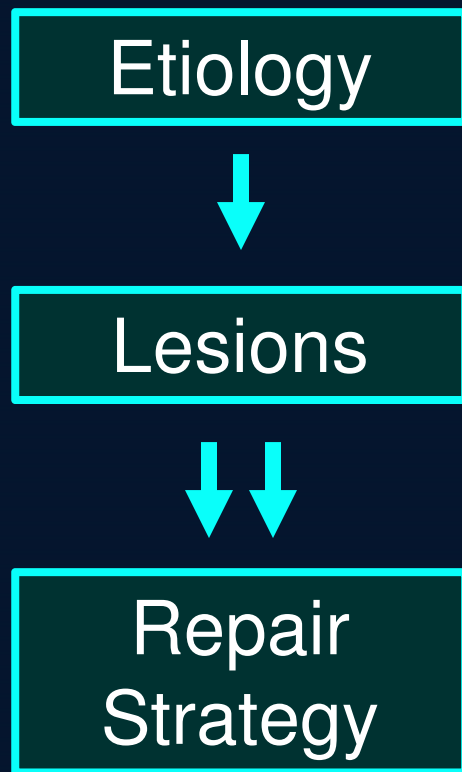
- SEVERE (intervene)
- MODERATE (observe)
- MILD (ignore)
- Or “DON’T KNOW” (seek further diagnostic data)

- Other distinctions, quantitative measurements and categorizations are unhelpful to the surgeon

The Pathophysiological Triad



Lesion based approach to mitral valve repair



Etiology gives rise to lesions. Lesions determine the technique of repair – “one lesion, one technique”

Anyanwu AC and Adams DH ; J Thorac Cardiovasc Surg 2008;36

Chordae tendineae

Rupture

Etiology

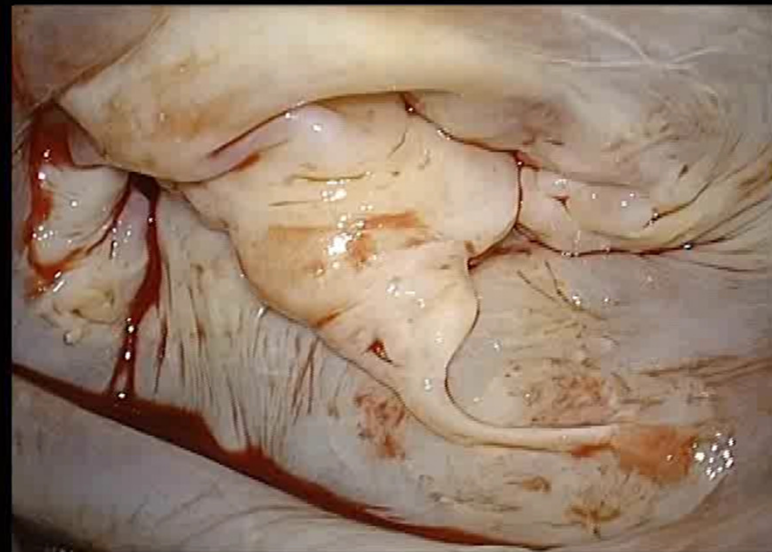
Degenerative ('FED', Barlow's), endocarditis

Dysfunction

Leaflet prolapse – single or multiple segment. Type II

Treatment

Leaflet resection, chordal replacement



Ruptured chordae – A2 and P2



Chordae tendineae

Fusion, fibrosis, retraction, shortening

Etiology

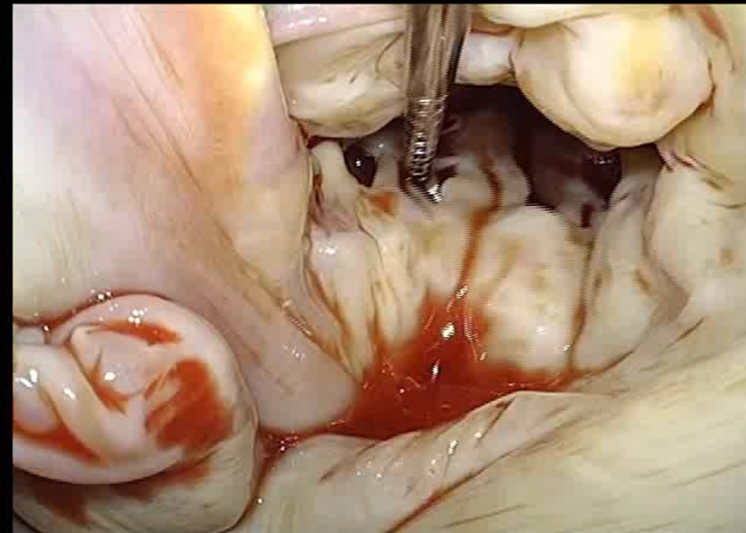
Rheumatic, (congenital, iatrogenic, radiation, Barlow's)

Dysfunction

Leaflet restriction. Type IIIa

Treatment

Chordal fenestration, division or replacement, valve replacement



Thickened, fused chords to posterior leaflet



Leaflet Perforation

Etiology

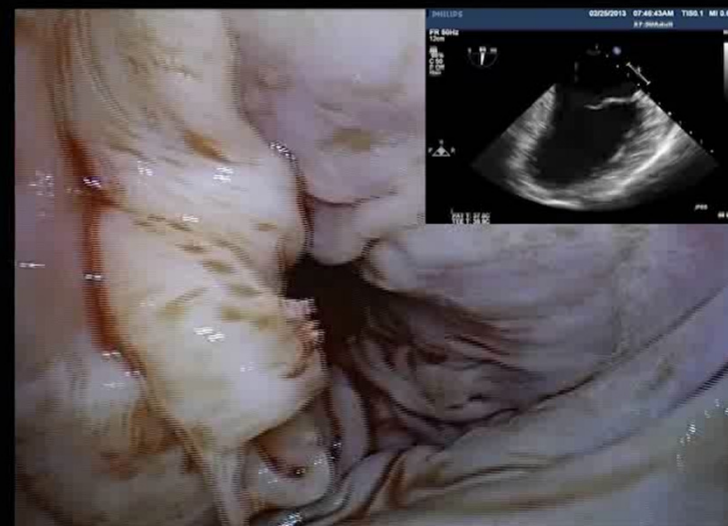
Endocarditis, iatrogenic

Dysfunction

Normal leaflet motion –leak through perforation. Type I

Treatment

Direct suture, leaflet resection, patch closure



Posterior leaflet perforation



Leaflet

Excess tissue - generalized

Etiology

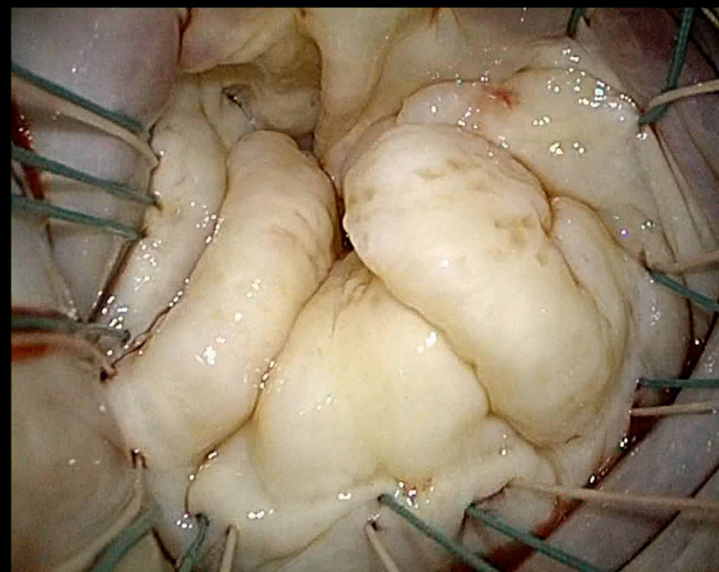
Degenerative (Barlow's, Forme Fruste)

Dysfunction

Prolapse, billowing. Type II

Treatment

Resection



Excess tissue both in height and transversely



Leaflet

Thickening, retraction, fibrosis, calcification

Etiology

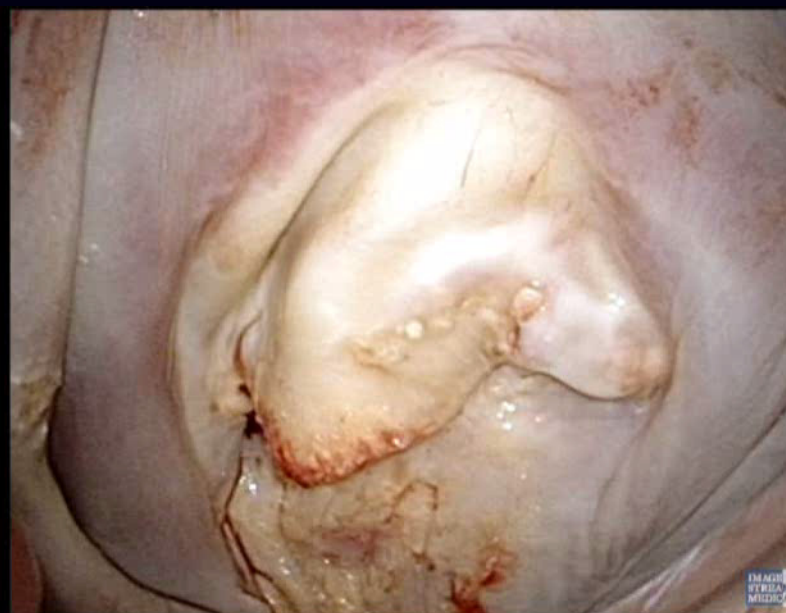
Rheumatic, post-surgical,
radiation

Dysfunction

Restricted leaflet motion.
Type IIIa, stenosis

Treatment

Leaflet 'shaving', leaflet
decalcification, limited
resection, valve replacement



Thickened non-pliable anterior leaflet with
microcalcifications



Primary Mitral Regurgitation: Surgeon's Perspective. *Five Questions to Ask*

1. How is the valve?
 - Is regurgitation severe
 - What is pathology and is it likely repairable?

2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease



CLASS IIa

- 1. Mitral valve repair is reasonable in asymptomatic patients with chronic severe primary MR (stage C1) with preserved LV function (LVEF >60% and LVESD <40 mm) in whom the likelihood of a successful and durable repair without residual MR is greater than 95% with an expected mortality rate of less than 1% when performed at a Heart Valve Center of Excellence (39,86,415–419). (Level of Evidence: B)**

Is likelihood of durable repair greater than 95%?

- Degenerative – yes (in centers of excellence)
- Annular dilatation – yes
- Endocarditis – depends on pathology and surgical skill available
- Rheumatic – No (except in favorable pathology)
- Others – depends on expertise and pathology

Primary Mitral Regurgitation: Surgeon's Perspective. *Five Questions to Ask*

1. How is the Valve?
 - Not Severe – watch. Severe – go to question #2
2. How is the patient feeling?

Symptomatic Patients

- Surgery is recommended regardless of etiology of mitral regurgitation except
 - Very depressed LV function (EF <30%)
 - Very high patient risk
- Surgery prolongs quality and quantity of survival

Primary Mitral Regurgitation: Surgeon's Perspective. *Five Questions to Ask*

1. How much MR?
 - Not Severe – watch. Severe – go to question #2
2. How is the patient feeling?
 - Bad (dyspnea) – Surgery. Good – go to question #3

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3. How is the heart?

Indications for surgery in the asymptomatic patient

Class I

- LVESD 40mm* (45mm ¶) or more
- LVEF 0.60 or less* ¶

Class IIa

- *New onset Atrial Fibrillation**¶
- Rest PASP > 50 mmHg* ¶
- LVESD 40 mm or more *if flail leaflet and repairable* ¶
- Any asymptomatic patient if probability durable repair > 0.95 and mortality <1% in center of excellence*

Class IIb

- Left atrial enlargement > 60ml/m² ¶
- Exercise PASP ≥ 60 mmHg ¶

Provided low surgical risk and very high likelihood of repair

* AHA/ACC 2014

¶ ESC 2012

LVESD – left ventricular end systolic dimension
LVEF – left ventricular ejection fraction

Asymptomatic Patients

- Rationale for surgery
 - Prevent onset of symptoms
 - ? Prolong life
- Indications for surgery remain controversial
 - No good early discriminators of patients who will do poorly without surgery
 - Existing triggers for intervention reflect very advanced disease
 - No robust data demonstrating benefit of surgery in patients without triggers
 - Surgery is not risk free and can fail

Triggers for surgery in severe mitral valve regurgitation

- Symptomatic patients – presence of symptoms alone indicates surgery
- Asymptomatic patients – echocardiographic or hemodynamic triggers
 - **Transthoracic Echocardiography**
 - TEE
 - MRI
 - Exercise testing

What is new in 2014 Guidelines?

- Before excluding a patient from having a Class I indication for surgery
(and therefore opening up a choice of watchful waiting)
 - Confirm asymptomatic status (exercise testing)
 - Confirm the volume and function measurements from TTE are reliable
 - If doubt use TEE or CMR to validate LV volume and dimensions

2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease



CLASS IIa

2. Mitral valve repair is reasonable for asymptomatic patients with chronic severe nonrheumatic primary MR (stage C1) and preserved LV function (LVEF >60% and LVESD <40 mm) in whom there is a high likelihood of a successful and durable repair with 1) new onset of AF or 2) resting pulmonary hypertension (pulmonary artery systolic arterial pressure >50 mm Hg) (363,415,420–425). (*Level of Evidence: B*)

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 - LA dilatation, AF, pulm HTN – May consider Surgery
 - “Not” dilated or dysfunctional – go to question # 4

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CLASS IIa

- 1. Mitral valve repair is reasonable in asymptomatic patients with chronic severe primary MR (stage C1) with preserved LV function (LVEF >60% and LVESD <40 mm) in whom the likelihood of a successful and durable repair without residual MR is greater than 95% with an expected mortality rate of less than 1% when performed at a Heart Valve Center of Excellence (39,86,415–419). (Level of Evidence: B)**

What is new?

- Heart Valve Centers of Excellence

CLASS IIa

1. Mitral valve repair is reasonable in asymptomatic patients with chronic severe primary MR (stage C1) with preserved LV function (LVEF >60% and LVESD <40 mm) in whom the likelihood of a successful and durable repair without residual MR is greater than 95% with an expected mortality rate of less than 1% when performed at a Heart Valve Center of Excellence (39,86,415–419). (Level of Evidence: B)

2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease



development of Heart Valve Centers of Excellence. Heart Valve Centers of Excellence 1) are composed of experienced healthcare providers with expertise from multiple disciplines; 2) offer all available options for diagnosis and management, including complex valve repair, aortic surgery, and transcatheter therapies; 3) participate in regional or national outcome registries; 4) demonstrate adherence to national guidelines; 5) participate in continued evaluation and quality improvement processes to enhance patient outcomes; and 6) publicly report their available mortality and success rates. Decisions about intervention at the

What is new in 2014 guidelines?

- Class IIa recommendation for Early Surgery for **any** asymptomatic patient with severe MR, provided
 - Probability of repair is more than 95%
 - Probability of residual mitral regurgitation is less than 5%
 - Repair is likely to be durable
 - Operative mortality is below 1%
 - AND patient is in a “center of excellence”
- Otherwise operate only for a Class I trigger (onset of symptoms or LV dilatation or dysfunction)
- *Note Class IIa triggers (pulmonary hypertension, atrial fibrillation) also mandate high reparability and durable repair in 2014 guidelines*

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4. How is the surgeon and what is the most likely operative result?
 - High likelihood of repair AND low operative risk – Consider Surgery
 - Otherwise periodic medical surveillance (‘watchful waiting’)

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Is there reasonable expectation of *net* benefit from surgery

- Is there reasonable expectation of benefit?
- Does the expected benefit outweigh the risks?

Is there benefit from surgery?

Asymptomatic patients

- Only benefit is improved life expectancy and event free survival
- Patient must live long enough (several years) to derive tangible benefit from surgery
 - Not elderly
 - No major systemic disease
 - No socioeconomic factors that limit survival

Symptomatic patients

- Expected benefit is improved quality of life (and possibly survival)
 - Reasonable belief that symptoms are due to MR
 - Reasonable expectation that quality of life will improve with MR correction

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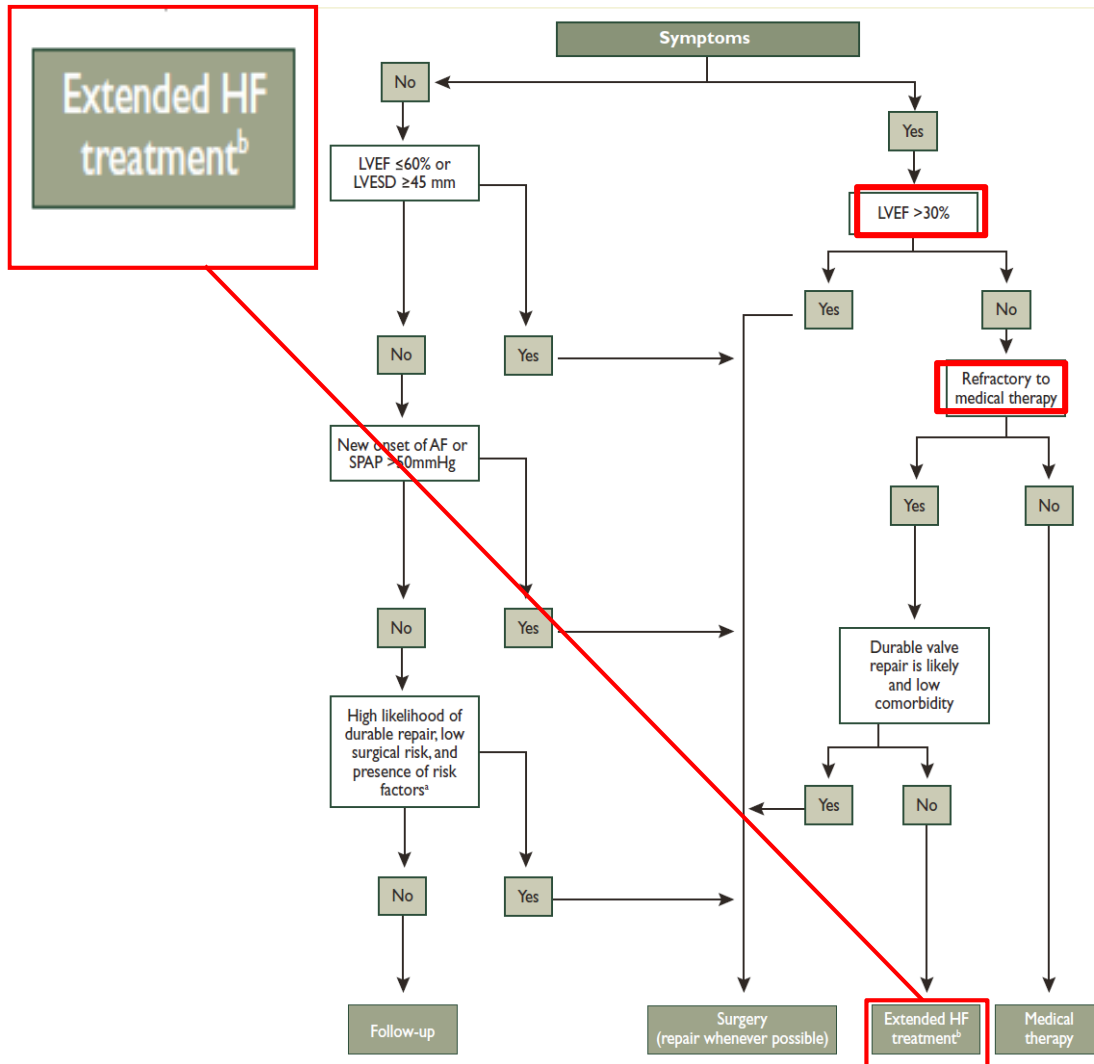
CLASS I

- 1. Mitral valve surgery is recommended for symptomatic patients with chronic severe primary MR (stage D) and LVEF greater than 30% (365,376). (Level of Evidence: B)**

When might the ventricle be too sick for primary mitral valve repair?

- Very depressed ejection fraction (<20%)
- Very remodeled left ventricle (LVEDD > 65 mm)
- Lack of contractile reserve
- Evidence of myocardial scar or fibrosis
- Co-existing severe right ventricular dysfunction

European Guidelines 2012



Is operative risk excessive?

- Chances of achieving long-term benefit are low if upfront risk is high
- If high operative risk, decision for surgery will depend on
 - Symptom severity
 - Patient choice
 - Available alternatives to mitral valve surgery

Is (current) quality of life very limited?

- Will surgery likely improve quality of life?
 - If dominant cause of poor quality of life is cardiac, then worth considering surgery
 - If dominant cause of poor quality of life is non-cardiac then surgery likely futile
 - Severe neurological injury
 - Limited mobility for non-cardiac reasons
 - Severe COPD
 - Severe adverse psychosocial factors

Consider other options

- If benefit uncertain or risks excessive
 - Mitraclip (approved)
 - TMVR (investigational)
- If left ventricular dysfunction is too advanced
 - Transplantation
 - Left Ventricular Assist Device
 - Palliative Care

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Thank you