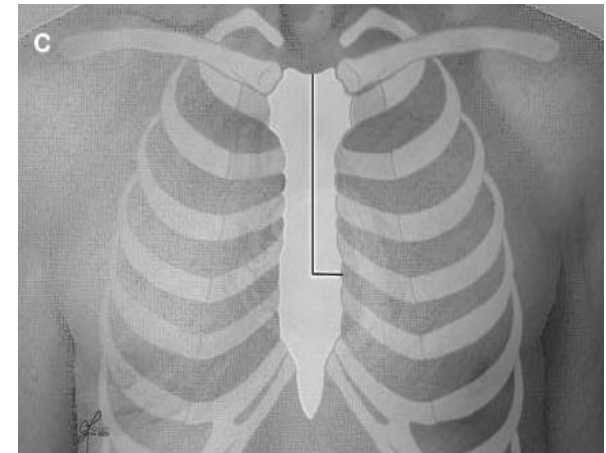
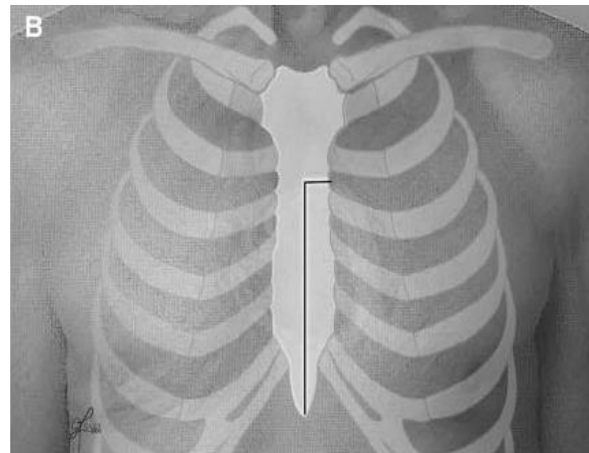
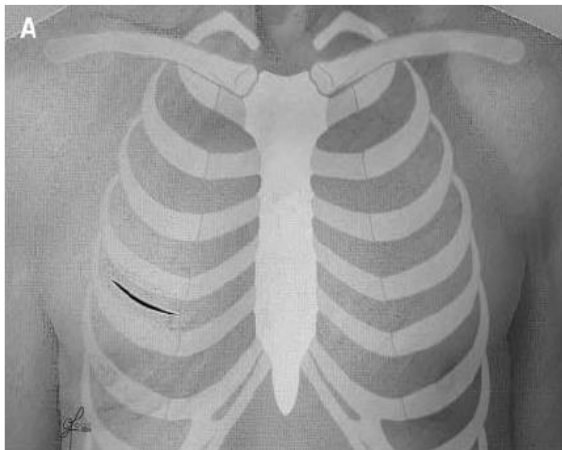
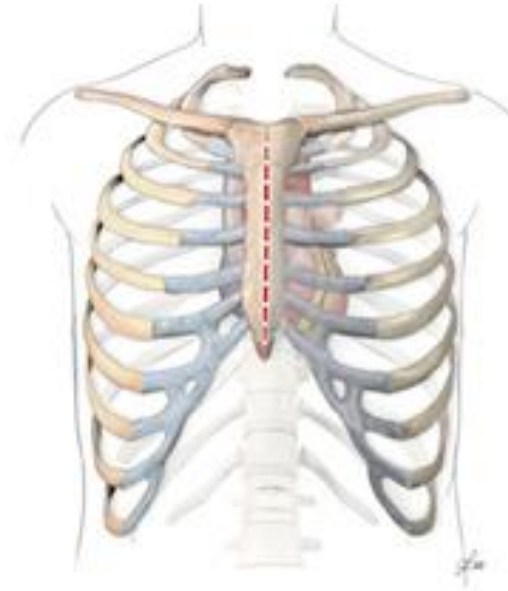


Indication & techniques of **Mitral valve** surgery

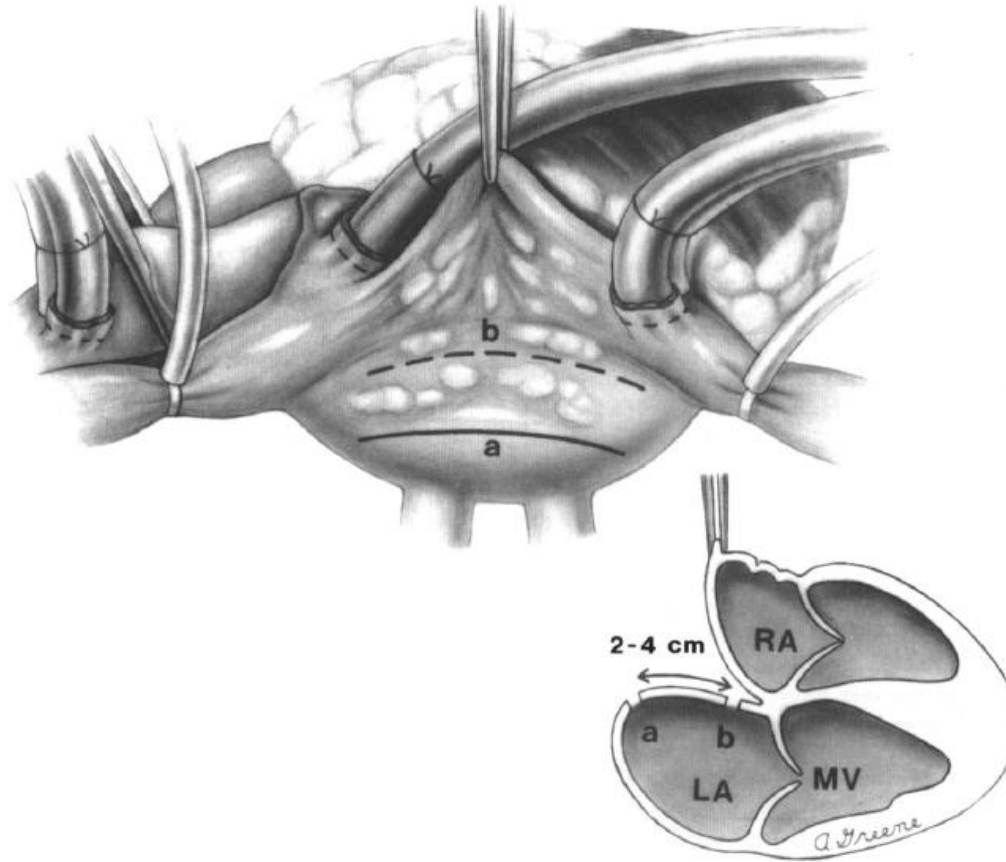
경북대학교병원
김근직

Mitral exposure



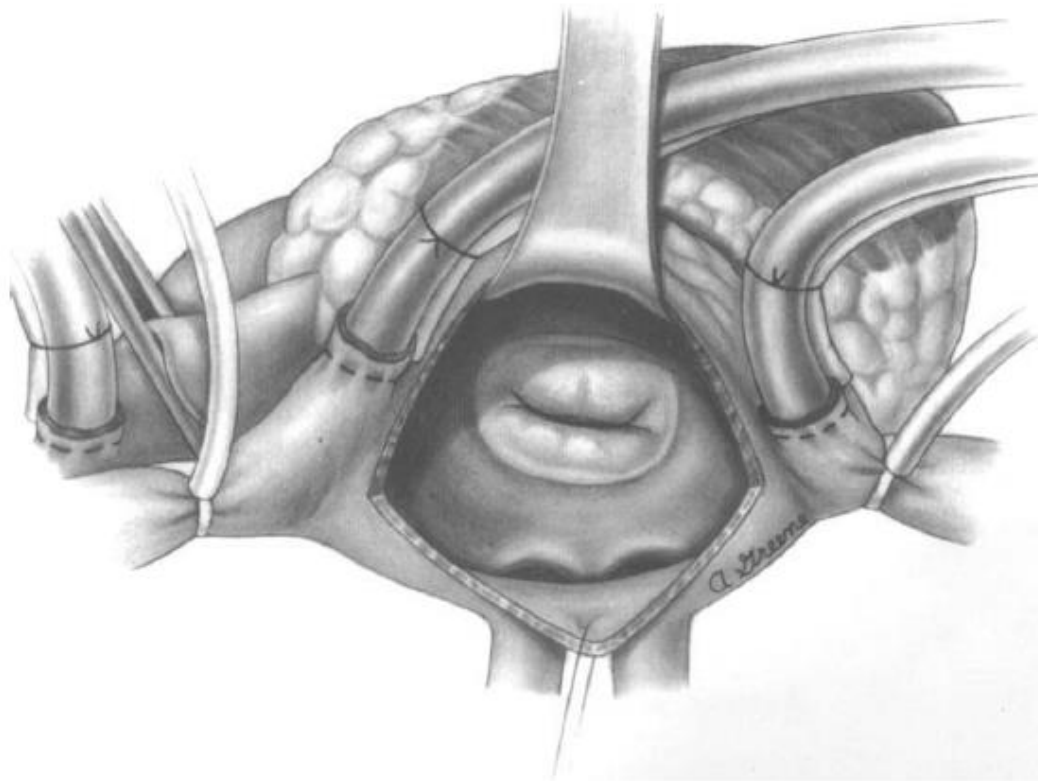
Mitral exposure

Vertical left atriotomy

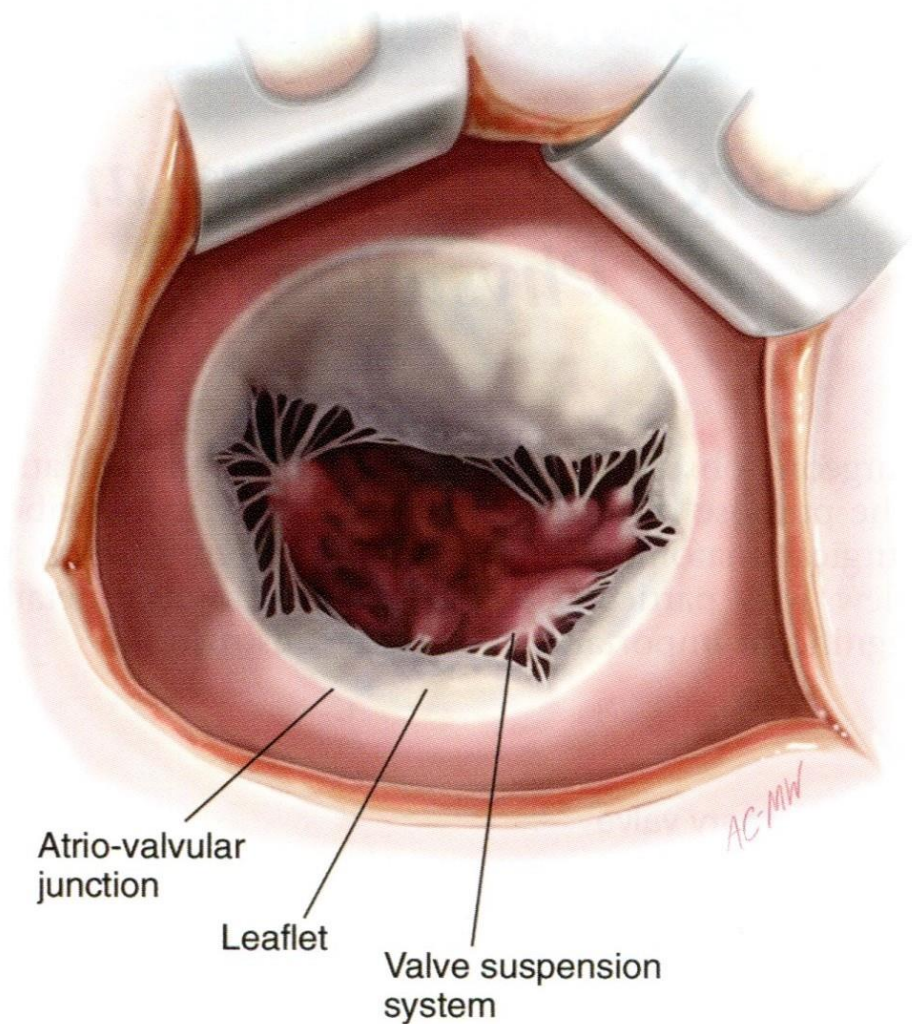


Mitral exposure

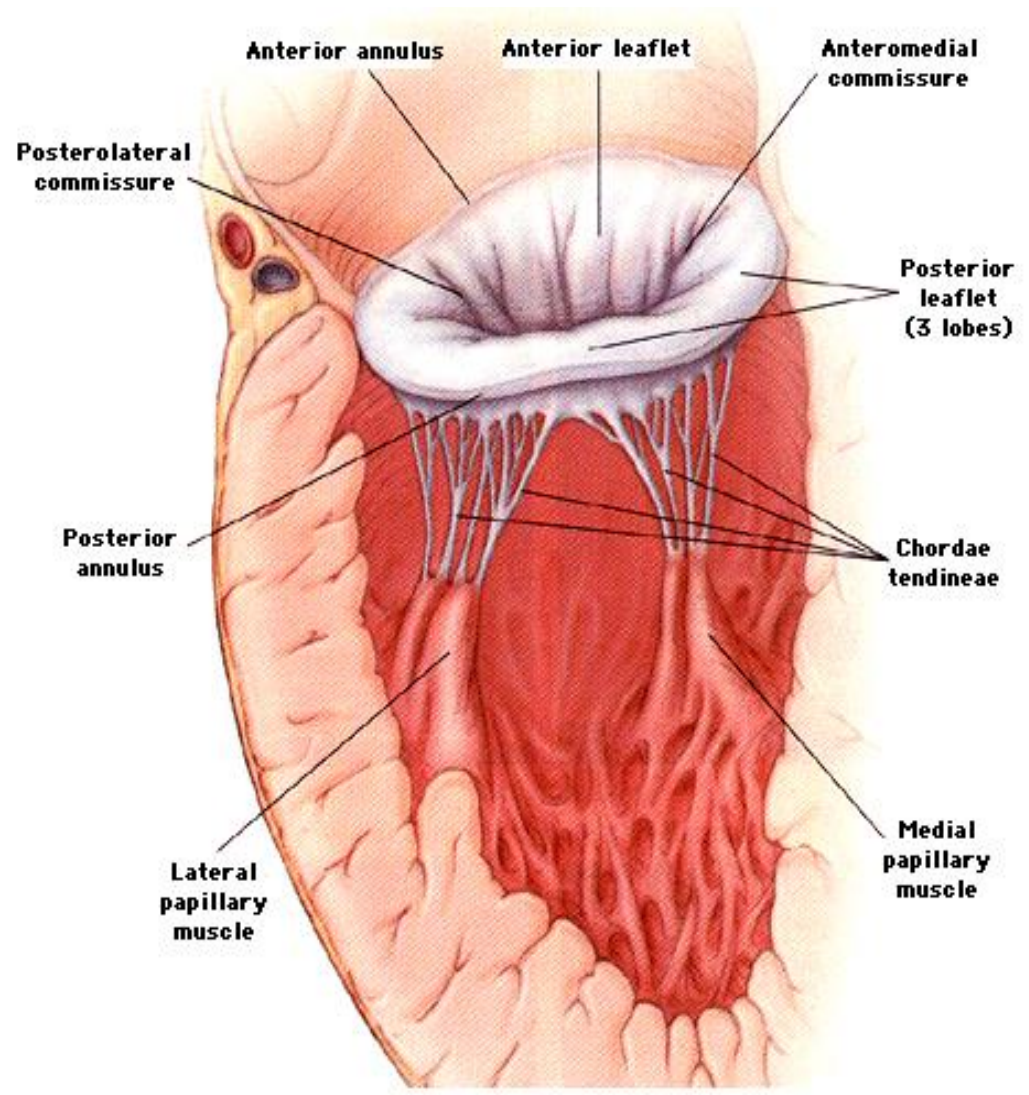
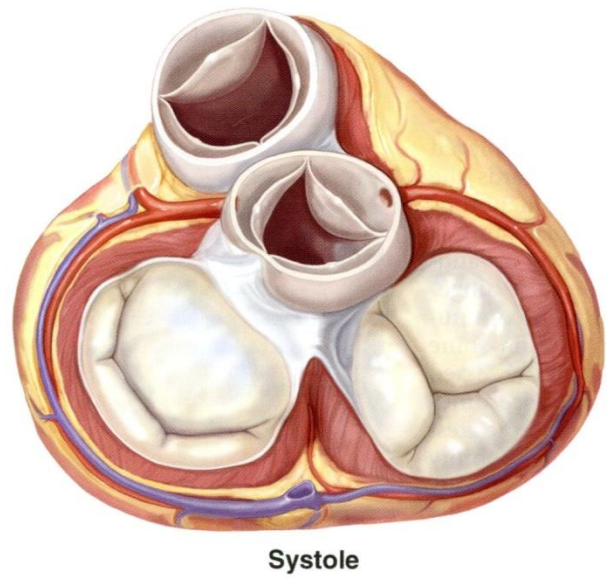
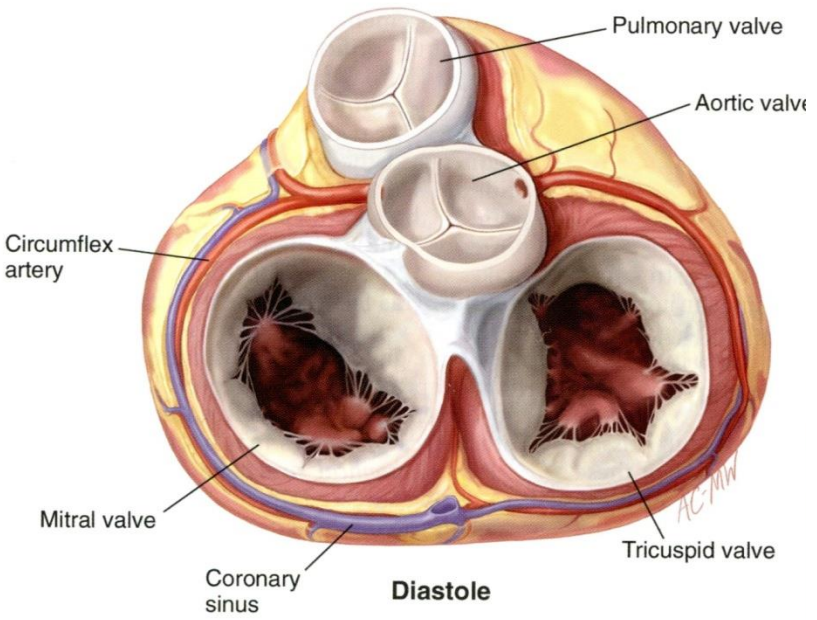
Vertical left atriotomy



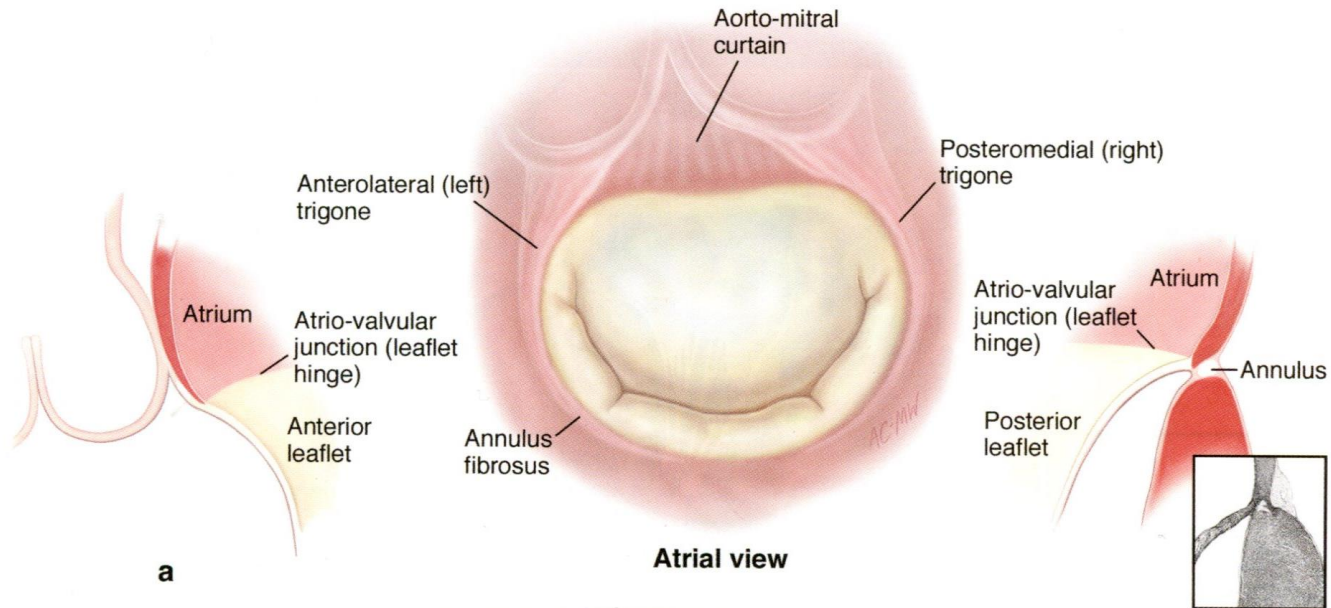
Anatomy of Mitral valve



- **Atrio-valvular junction**
- **Leaflet**
- **Suspension system**
 - Chordae
 - Papillary muscle

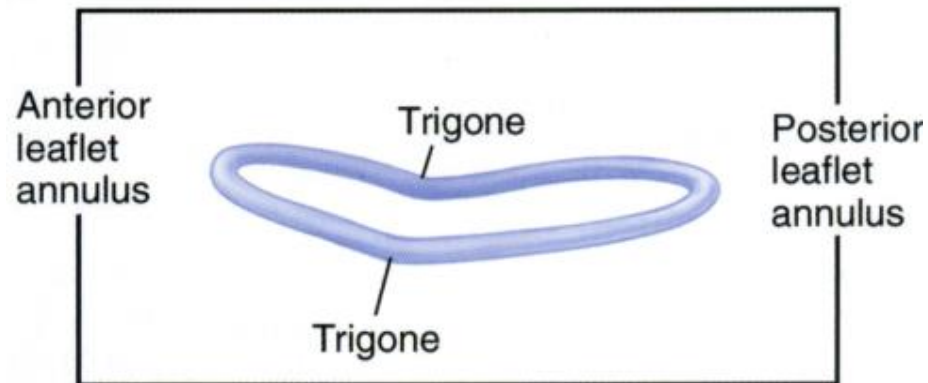


Annulus



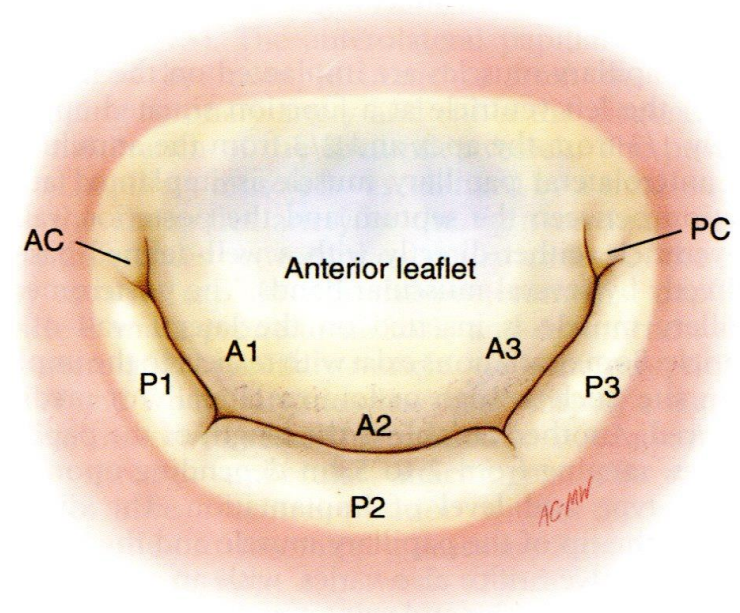
a

Atrial view



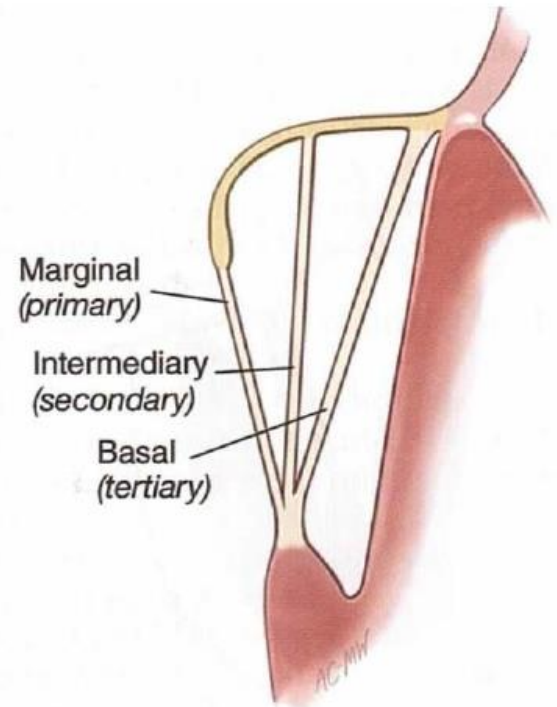
Leaflet

- **Anterior leaflet** : triangular – A1, A2, A3
- **Posterior leaflet**(indentation)
 - P1, P2, P3
- AL commissure
- PM commissure



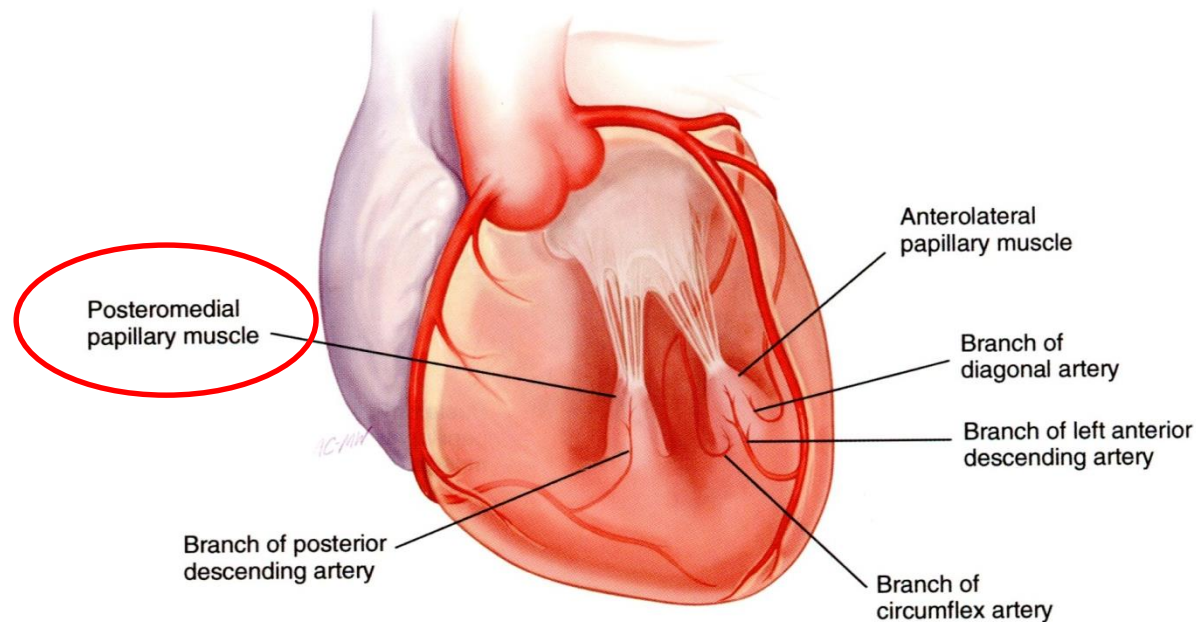
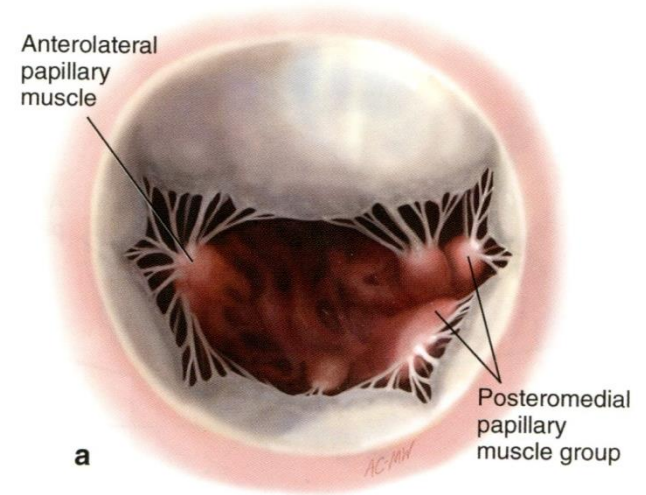
Chordae

- **Marginal(primary)**
: prevent eversion
- **Intermediary(secondary)**
: prevent doming
- **Basal(tertiary)**
: maintain geometry



Papillary muscle

- Anterolateral PM
- Posteromedial PM

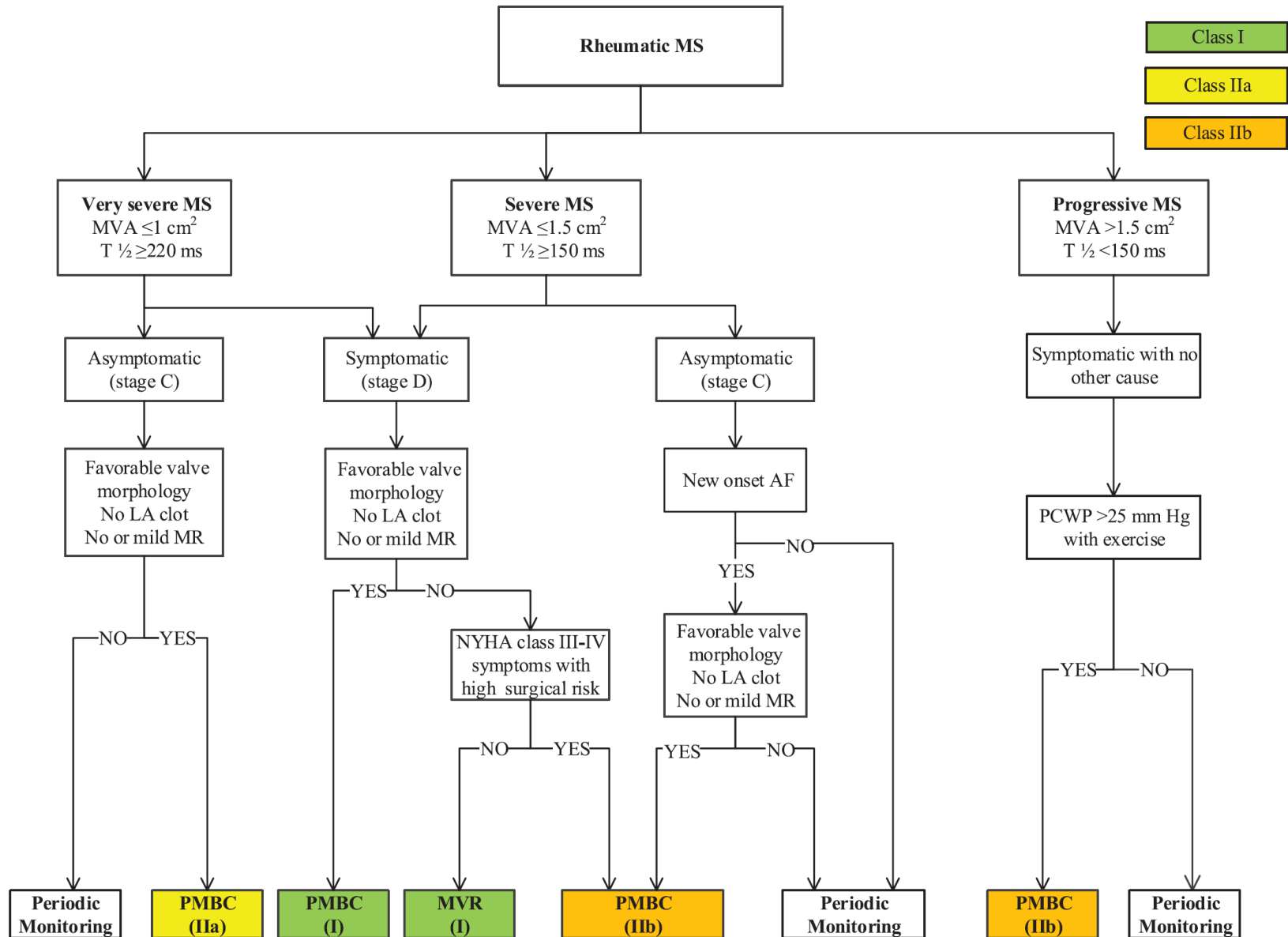


Mitral valve replacement

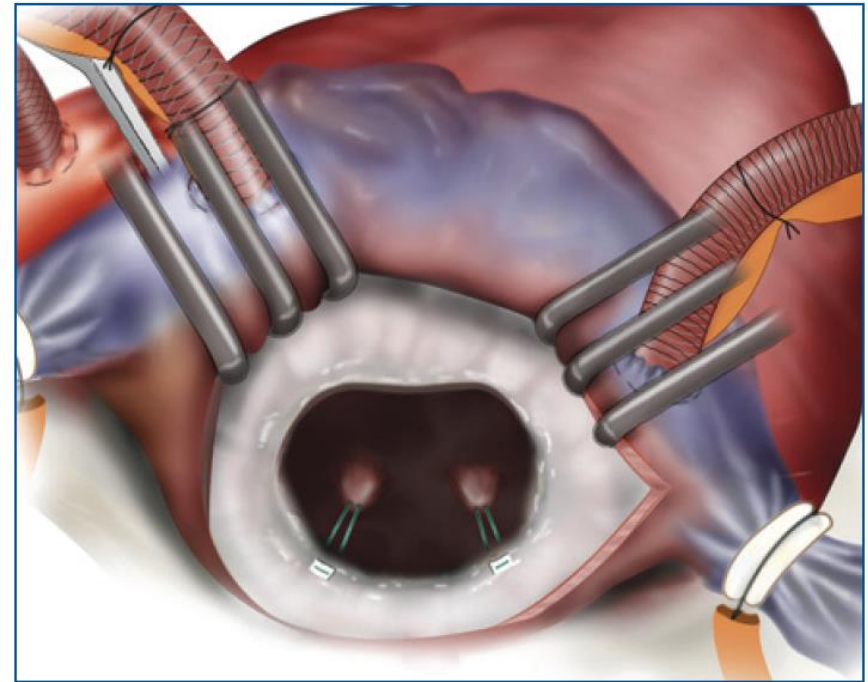
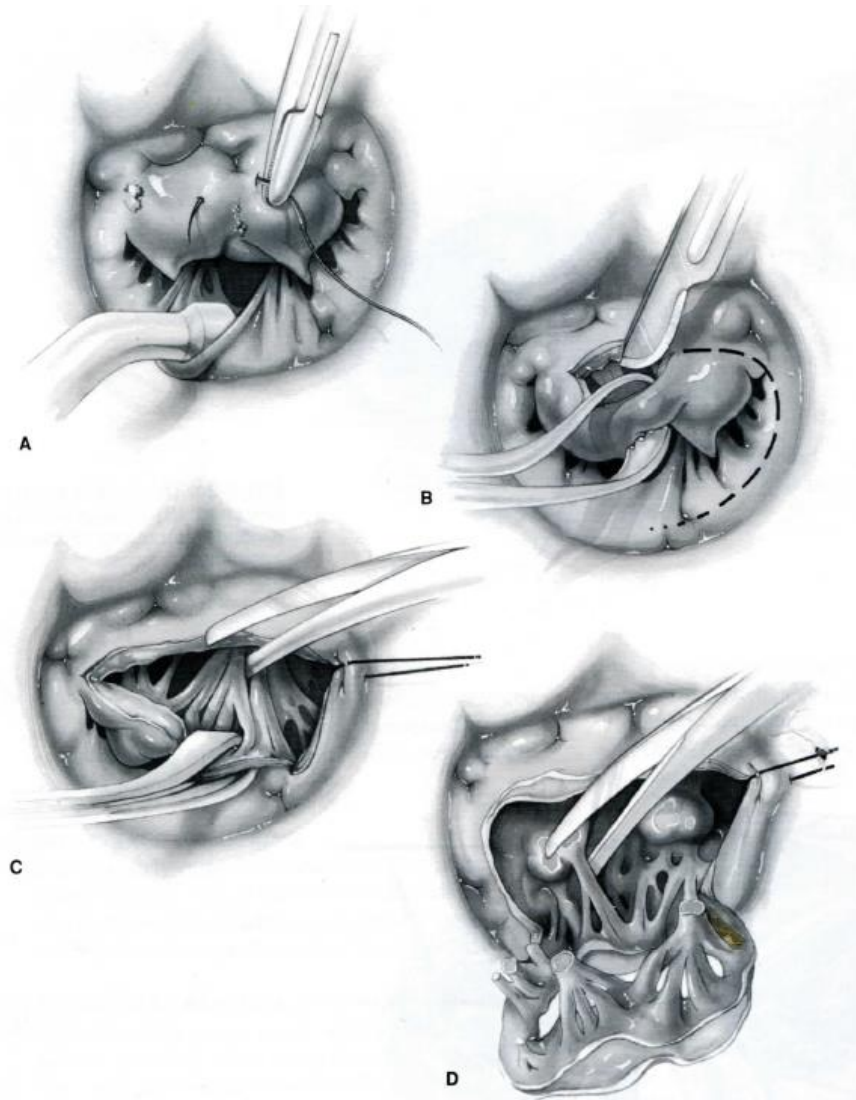
- ✓ **Mitral stenosis**
- ✓ **Mitral regurgitation**

Mitral stenosis

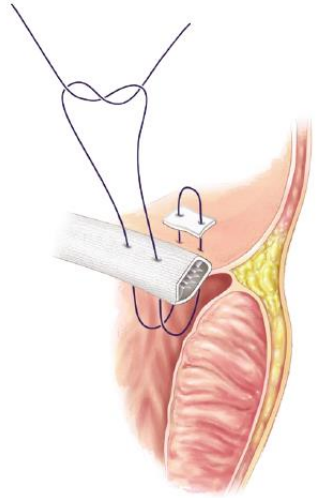
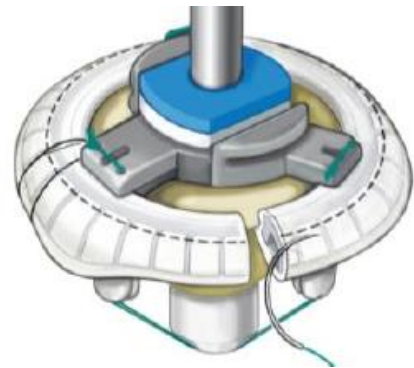
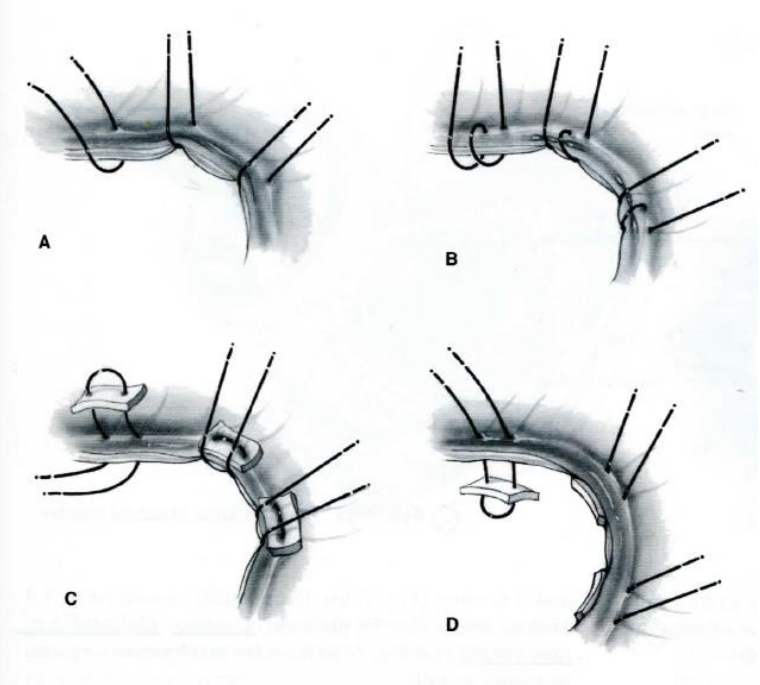
ACC/AHA 2014 guideline



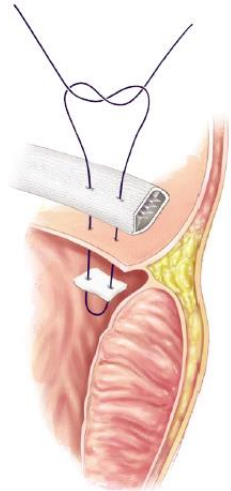
Mitral valve excision



Valve suture insertion



Atrial Placement



Ventricular Placement

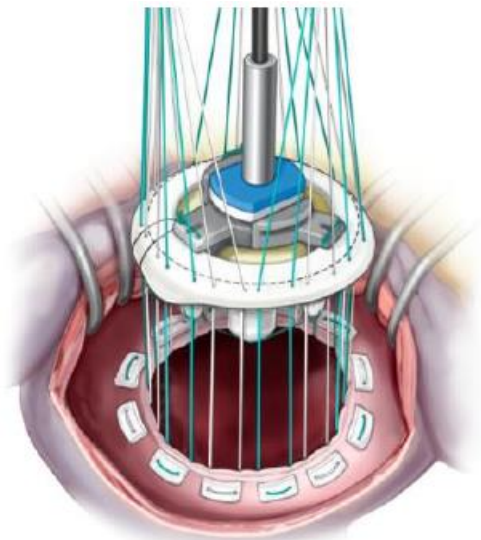
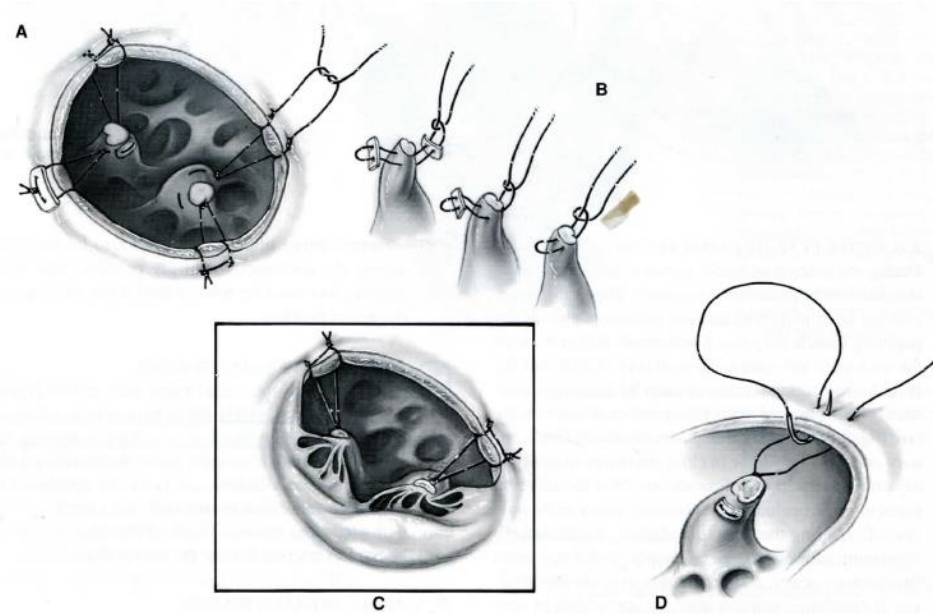
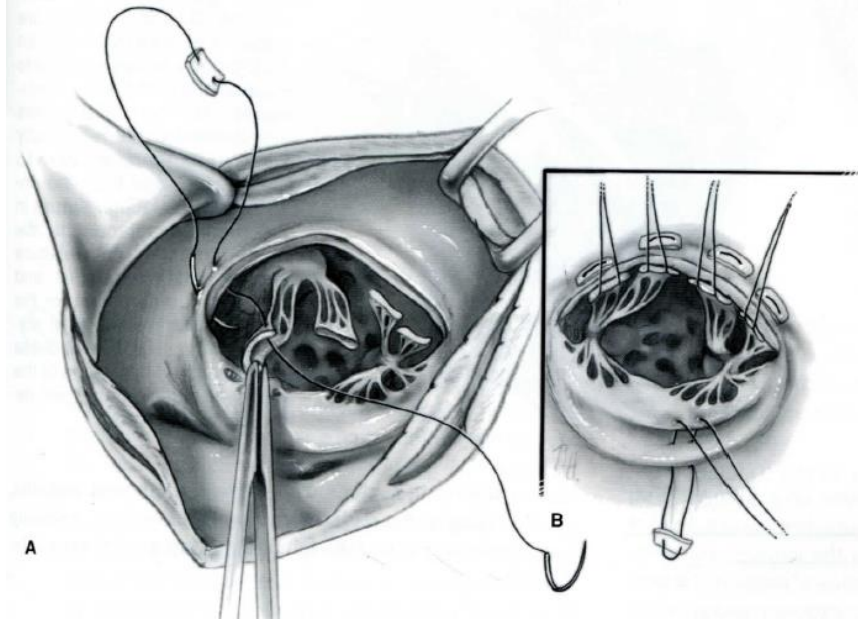
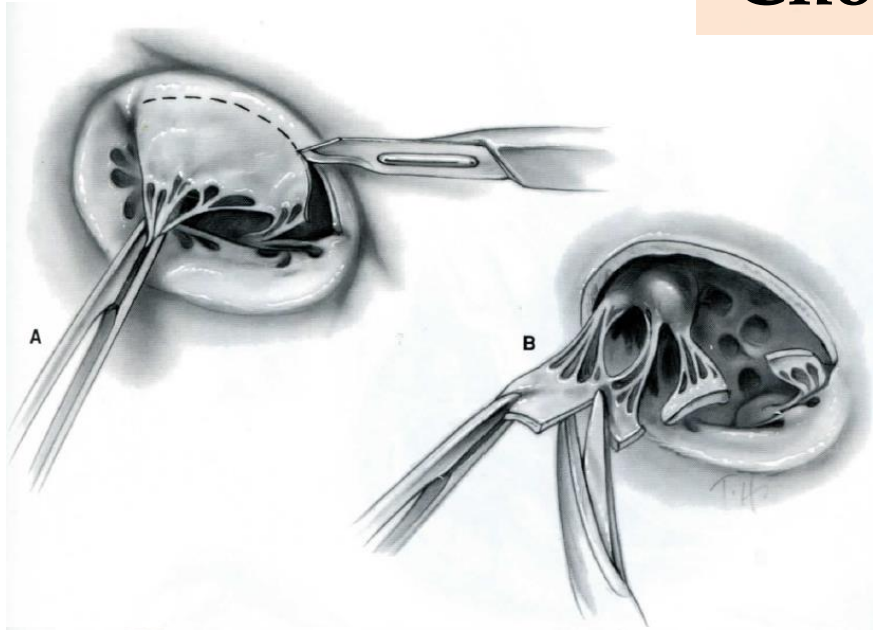
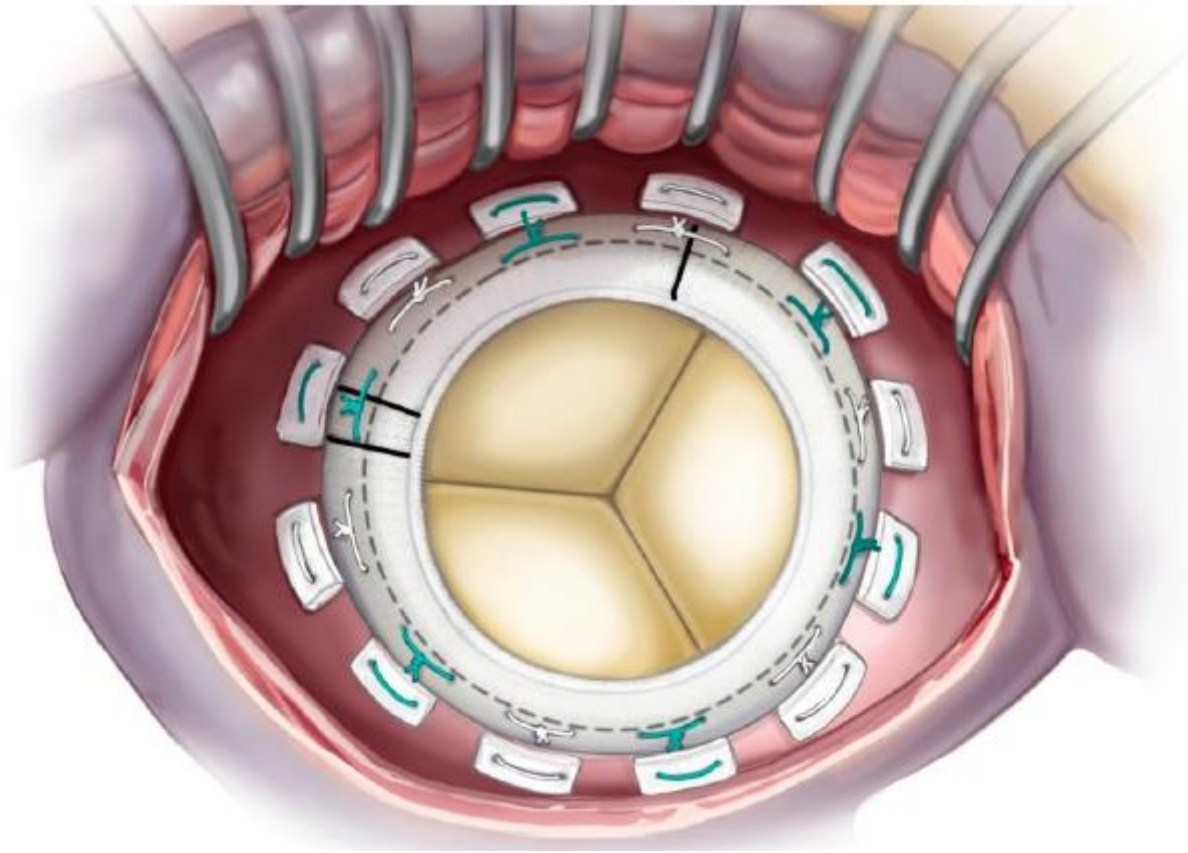


Figure 9

Chordal preservation



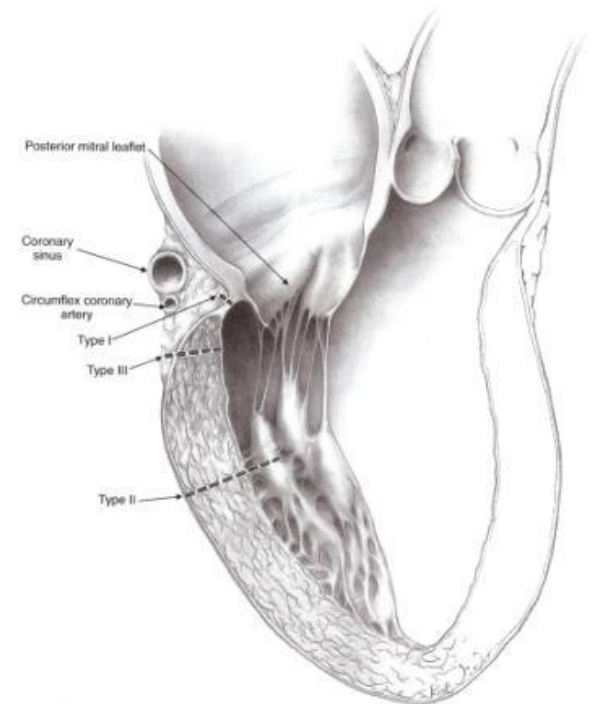


Complications after MV Replacement

- Thromboembolism
- Hemorrhage
- Endocarditis
- Arrhythmias
- Prosthesis malfunction
- Late cardiac failure
- LV rupture: untethered loop theory

Left Ventricular Rupture

- Cause
 - High profile tissue valve
 - Lesser subvalvular apparatus
 - Injuries during operation



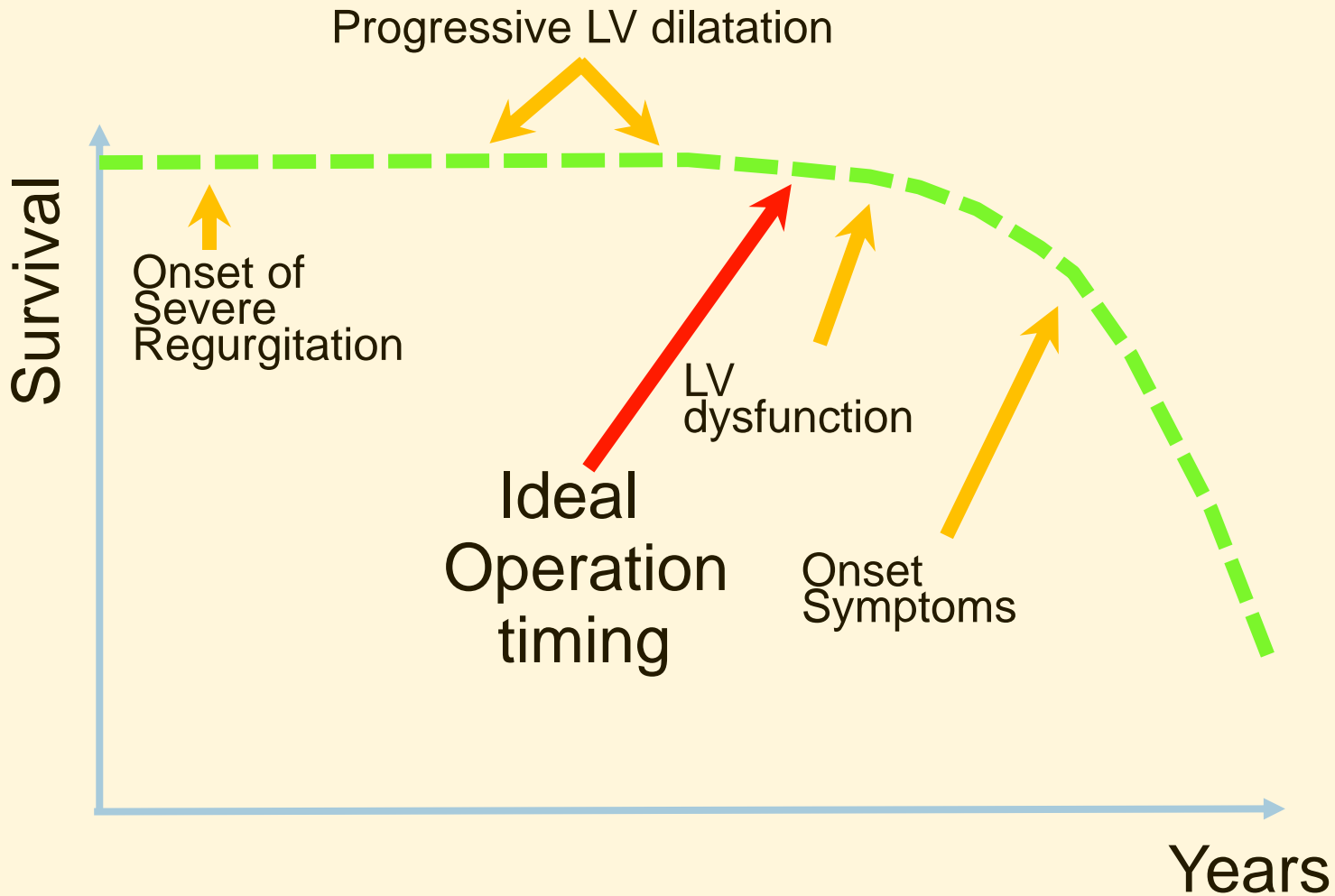
→ Should maintain annulopapillary continuity

Mitral valve repair

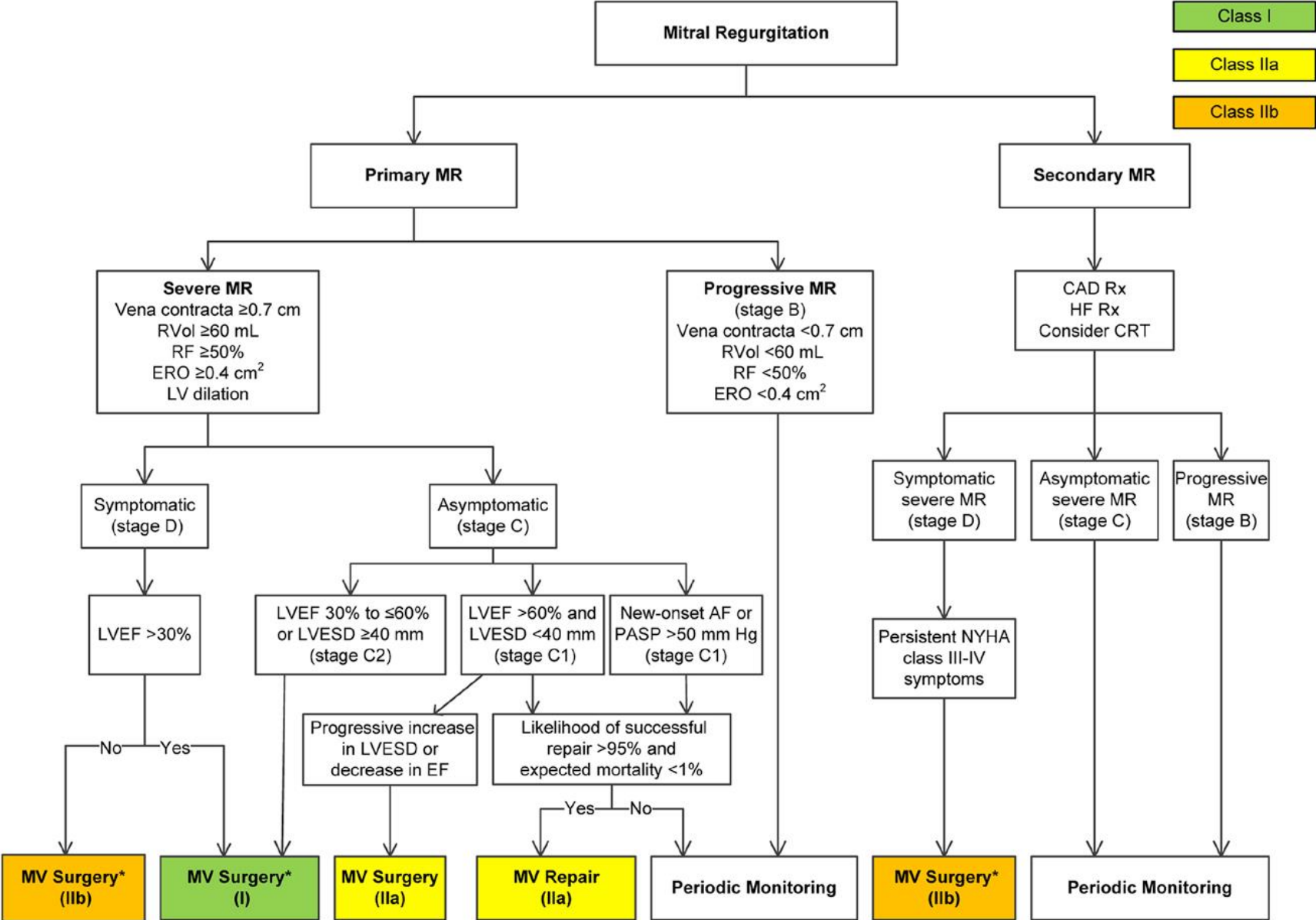
- ✓ **Mitral regurgitation**
- ✓ **Mitral stenosis**

Mitral regurgitation

Natural History



ACC/AHA 2019 guideline

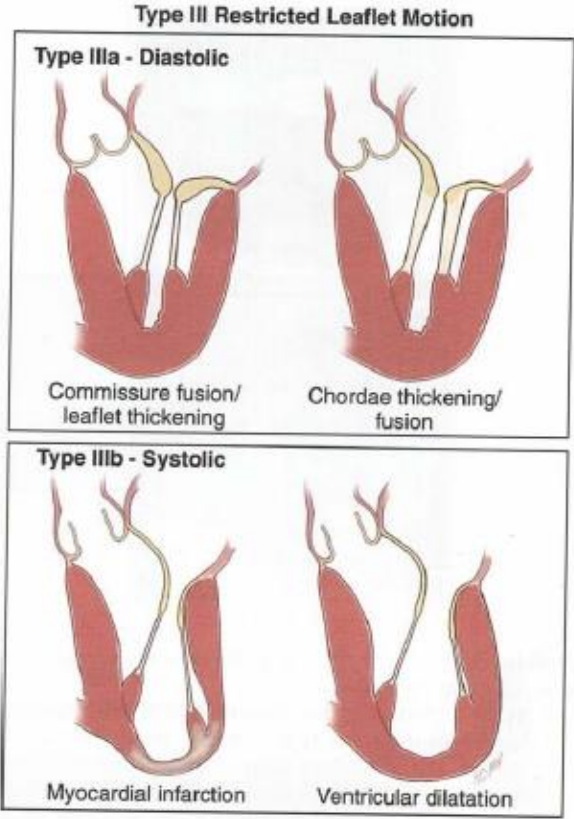
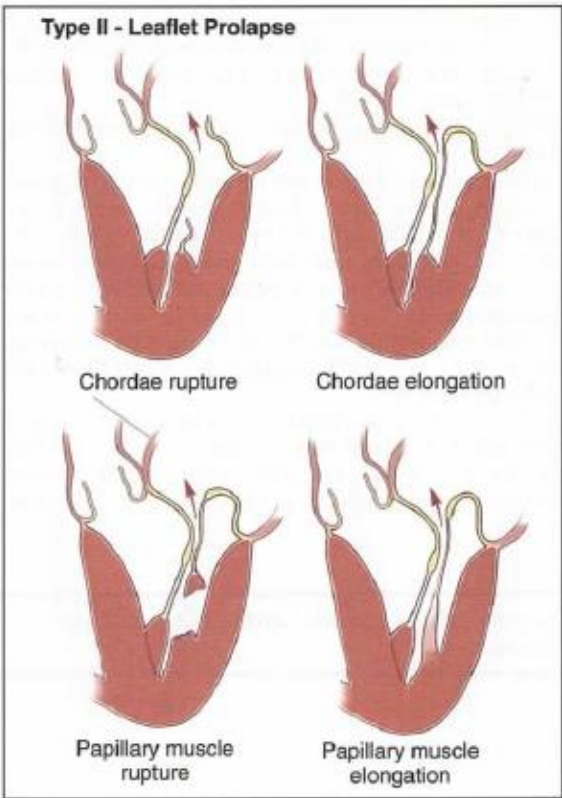
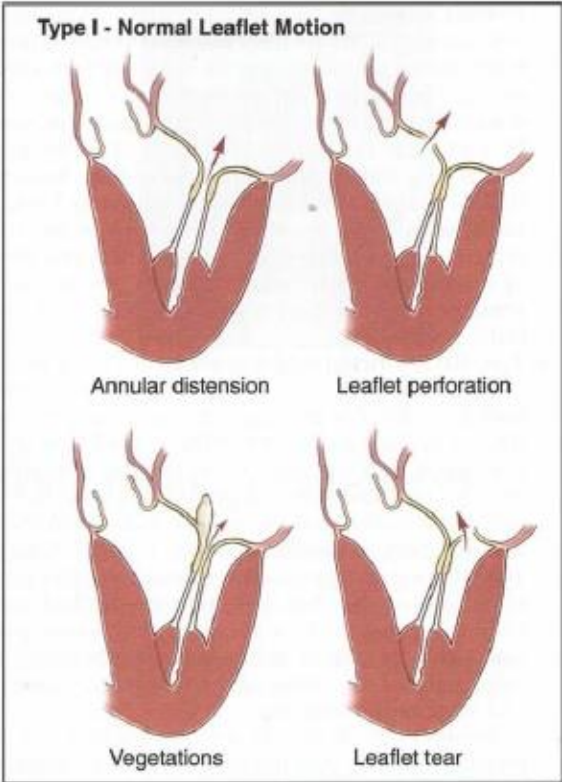


Reconstructive Valve Surgery

Three Fundamental Principles

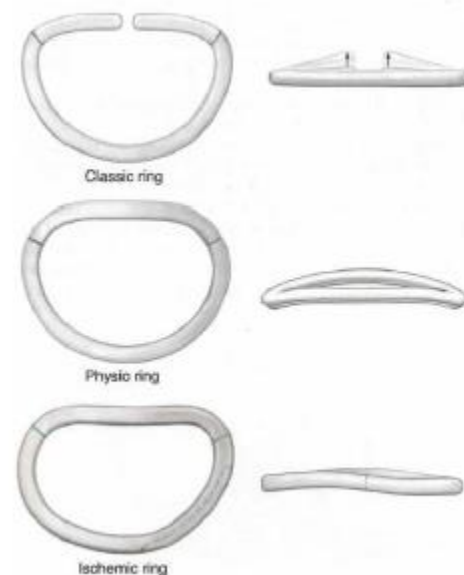
1. Preserve or restore full leaflet motion
2. Create large surface of coaptation
3. Remodel the annulus

Carpentier's Classification



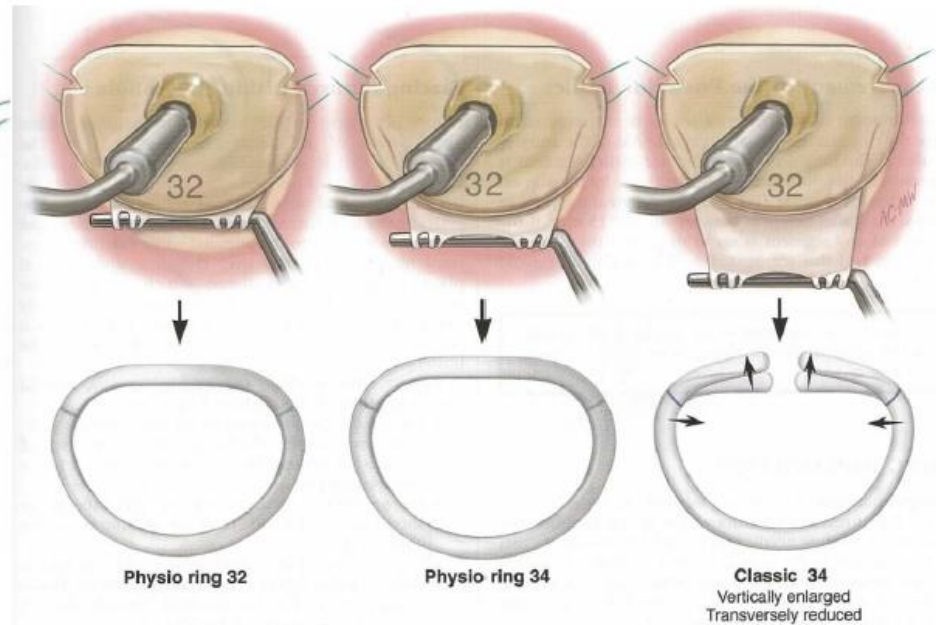
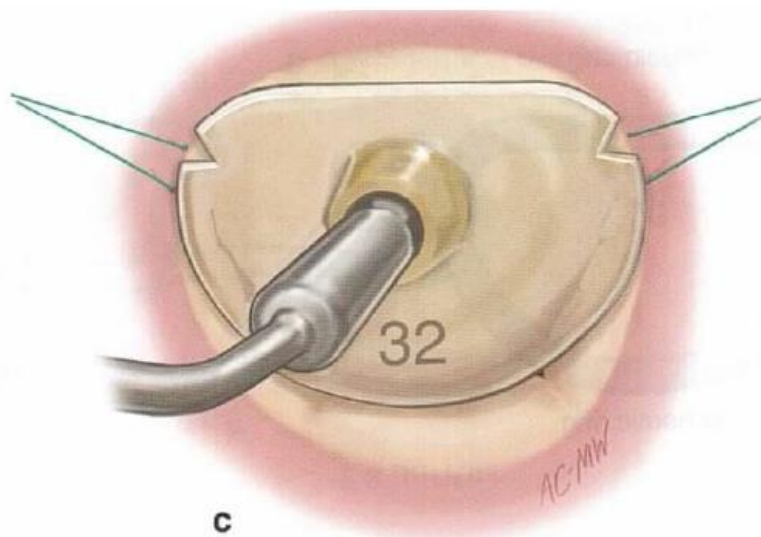
Annuloplasty ring

- **Complete vs incomplete**
 - Incomplete
 - Usually posterior annular dilatation
 - Leaflet repair itself reduce annular circumference
 - Difficult visualization of anterior annulus
 - Complete
 - Functional MR(to reduce annular circumference)
- **Rigid, Semi-rigid, Flexible**
 - Flexible ring
 - Physiologic movement of MV annulus
 - Valve distortion or orifice narrowing
 - Rigid ring : more prone to produce SAM
- **Adjustable vs fixed**



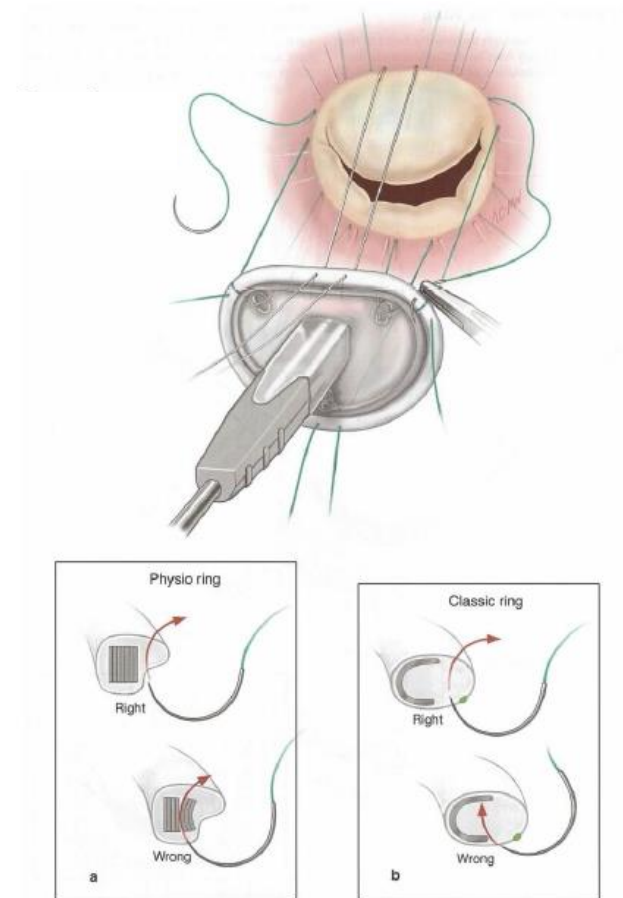
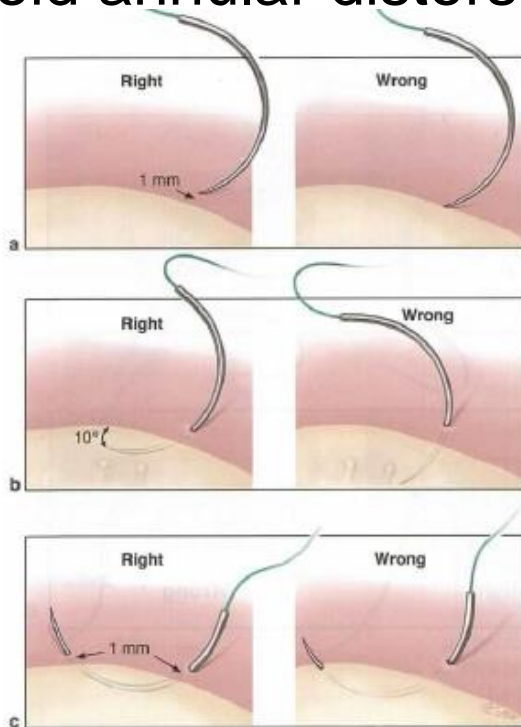
Ring sizing

- Measurement of anterior leaflet
- Commissure to commissure
- Height of anterior leaflet : partial ring?



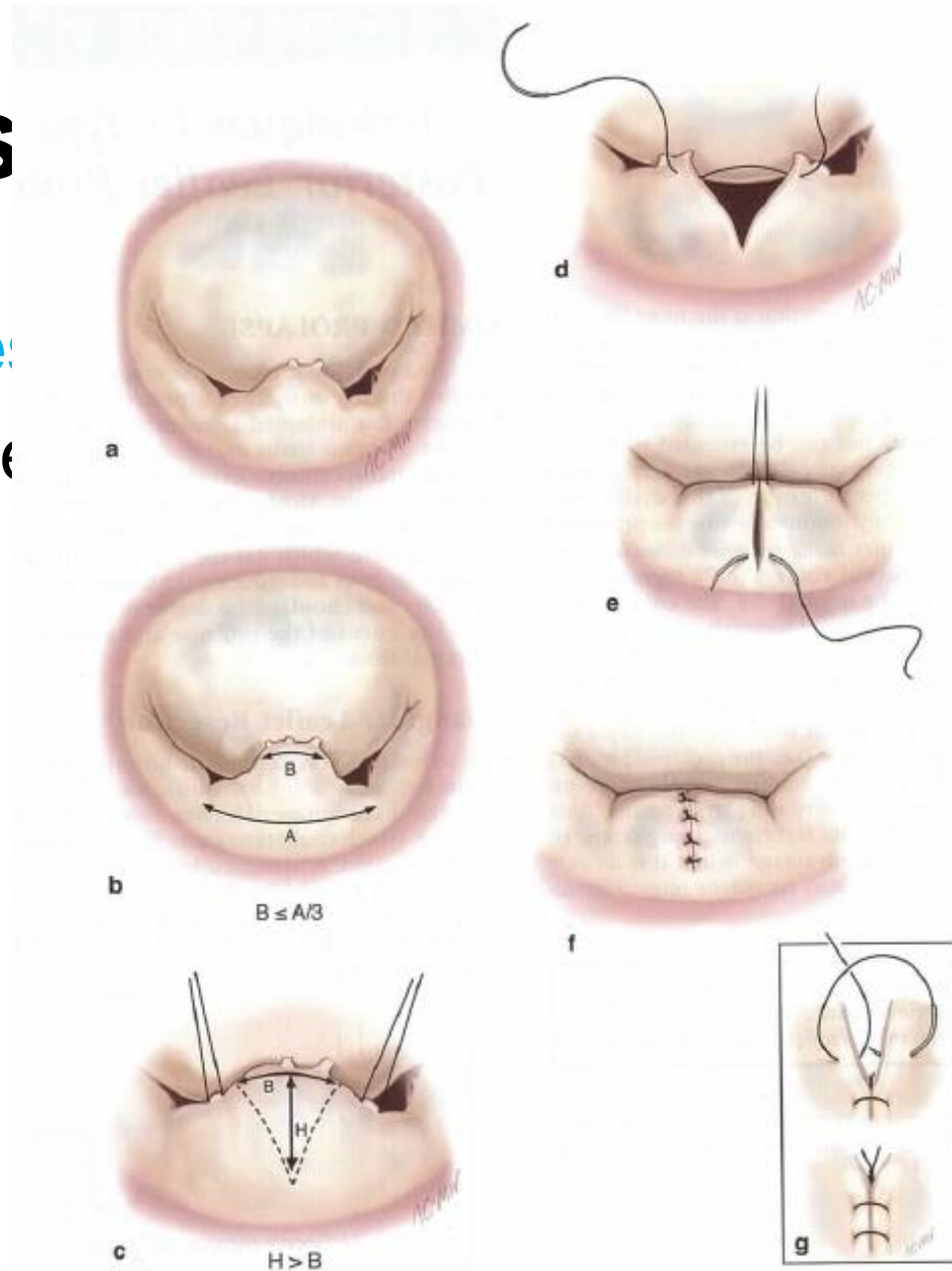
Annuloplasty suture

- Suture within the annulus fibrosus
 - to avoid ring dehiscence
- Not to suture metallic core of ring
 - to avoid annular distortion



Pos

- **Triangular re**
: $< 1/3$ of segme

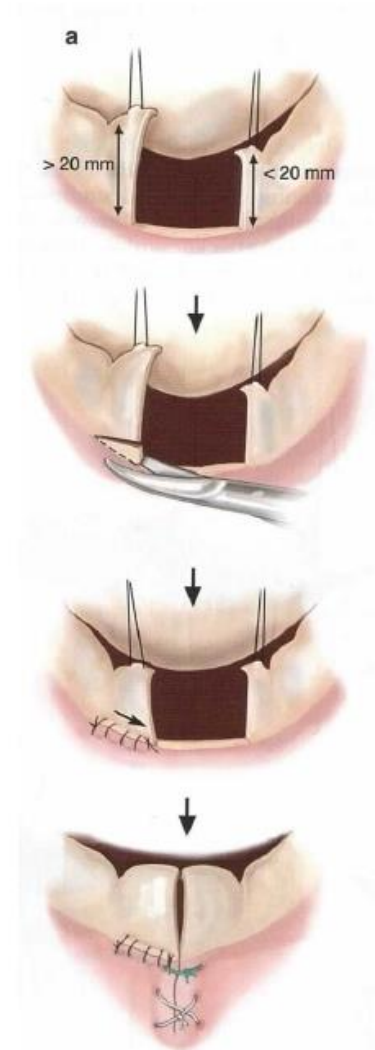
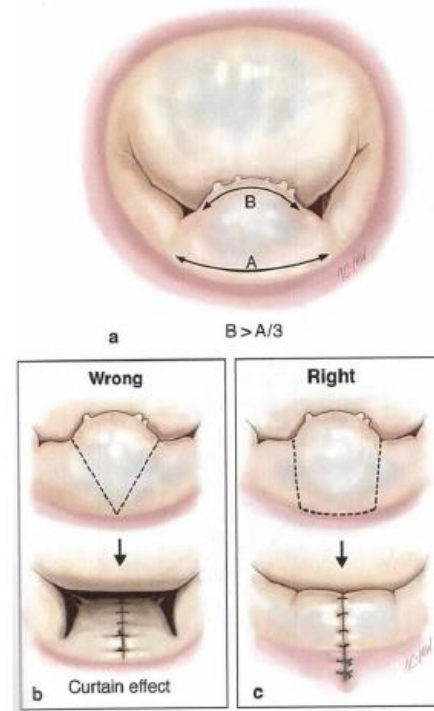


Posterior prolapse

- **Quadrangular resection**

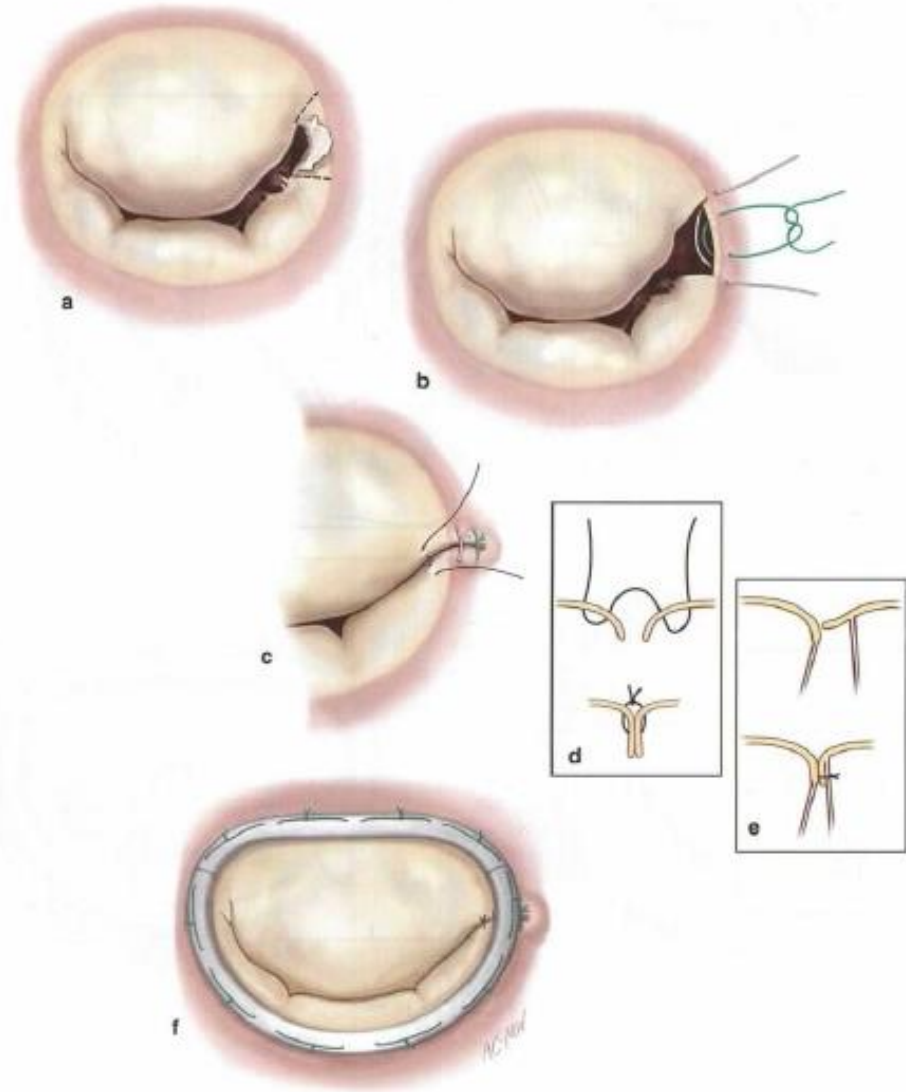
: $>1/3$ of segment

Annular plication



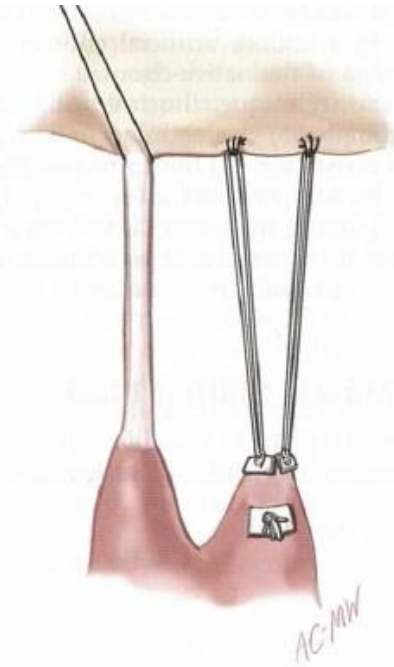
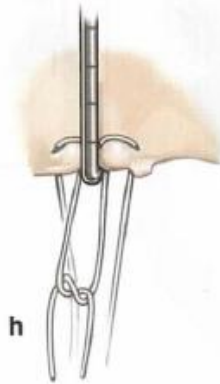
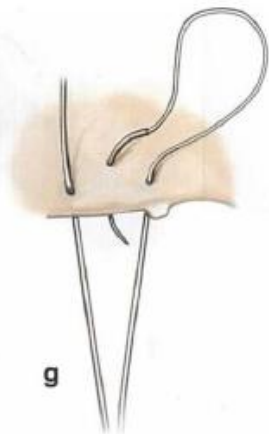
Commissural prolapse

- Commissural plication
- Triangular resection



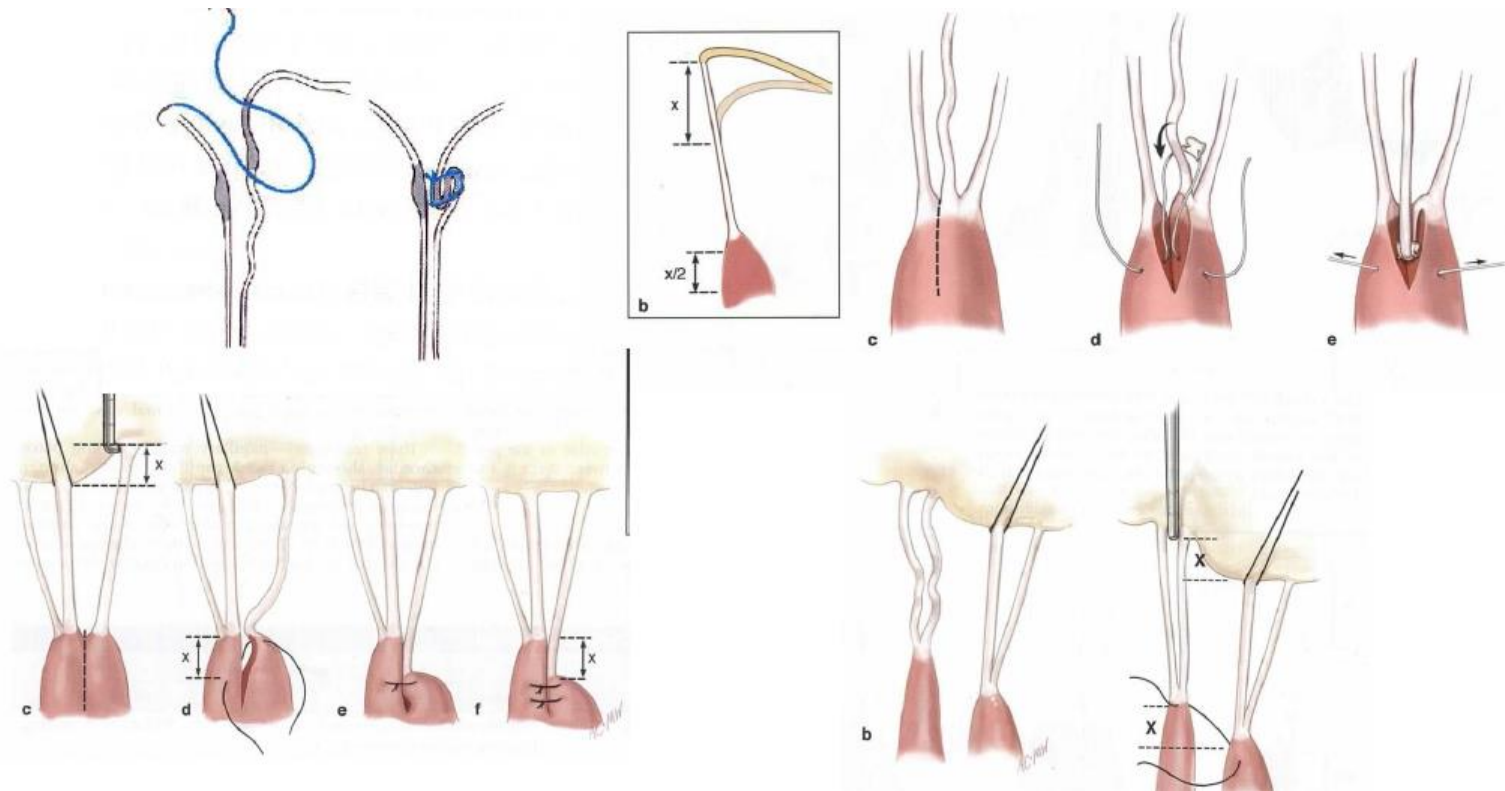
Anterior prolapse

- Long-term results : **posterior**>>anterior
- **Artificial chordae implantation**



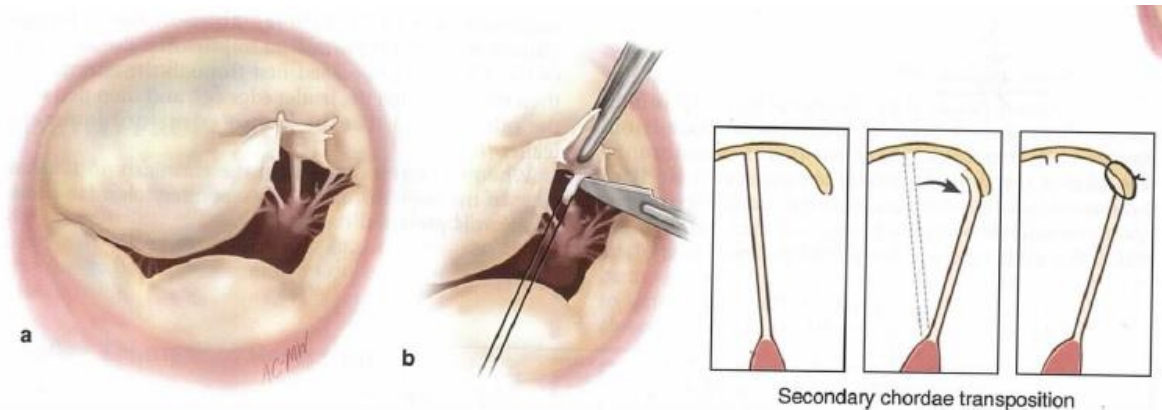
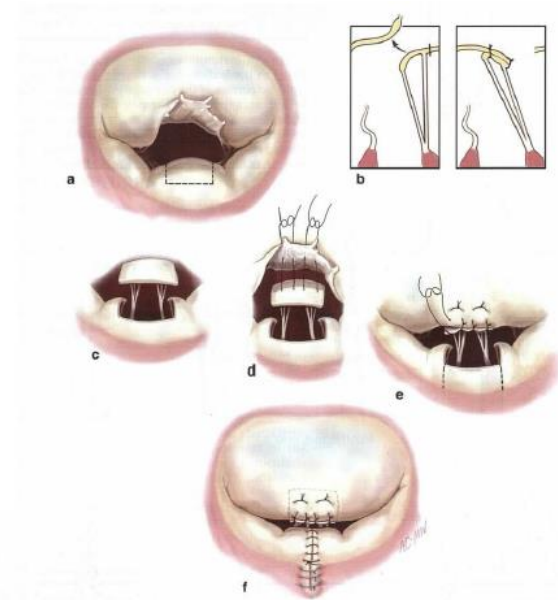
Anterior prolapse

- Chordae shortening
- Papillary muscle sliding plasty



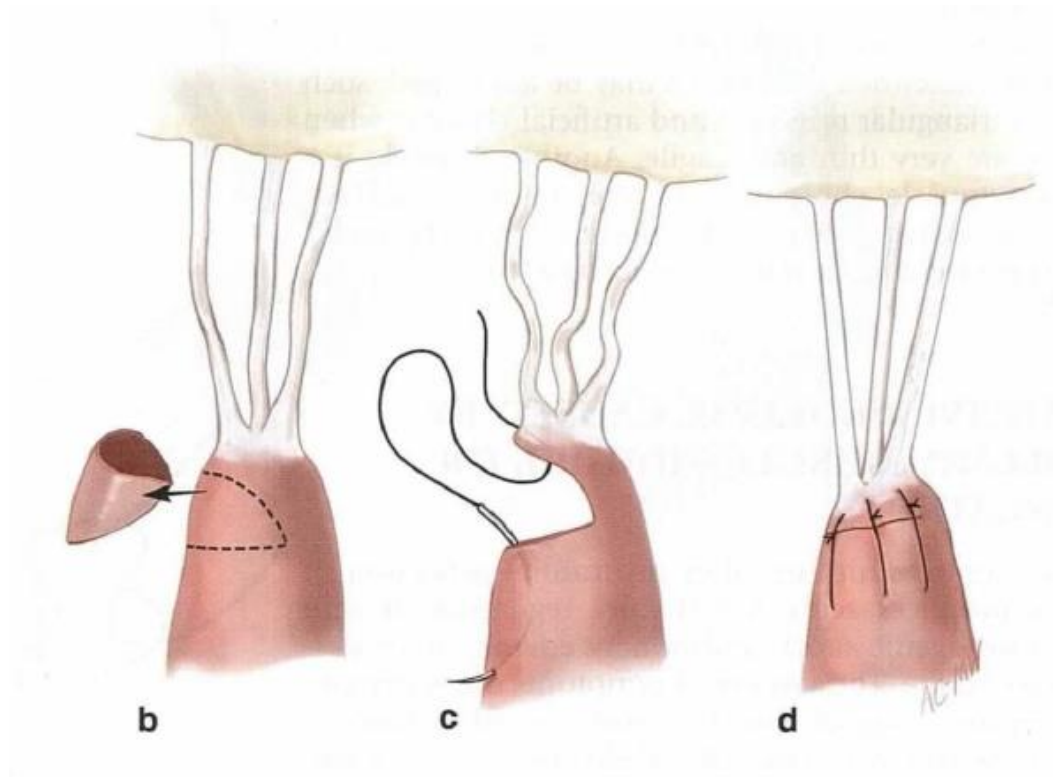
Anterior prolapse

- Chordae transfer
 - 2ndary chordae
 - Posterior chordae



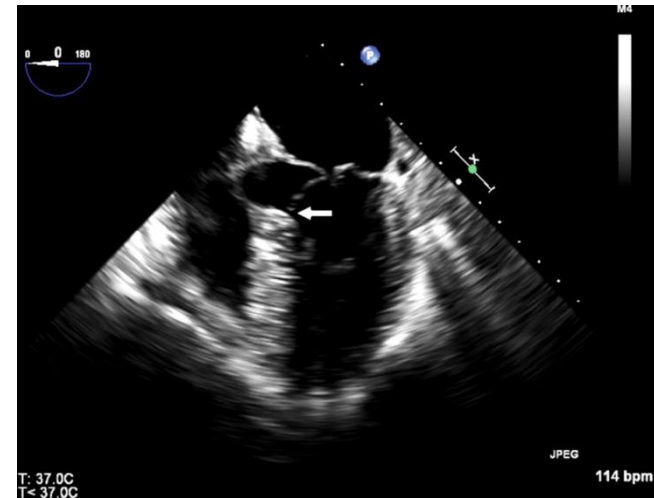
Anterior prolapse

- Papillary muscle shortening



SAM(Systolic Ant Motion)

- depend on **hemodynamic status**
- Risk factors
 - **Excess valvular tissue**
 - **Undersized annuloplasty**
 - Narrow aorto-mitral angle
 - Hyperkinetic small ventricle
 - Septum bulging
 - Abn. Configuration of Ant. leaflet



SAM-Medical Therapy

- Usually associated with
 - Hypotension
 - Hypovolemia
 - Small ventricular cavity
 - Ventricular hypertrophy
 - Hyperdynamic state(eg, catecholamine)
- Treatment
 - Withdrawal of inotrops
 - Volume loading
 - Slowing heart rate
 - Increased afterload

SAM-Repair Technique

- Larger annuloplasty ring

Band >> complete ring

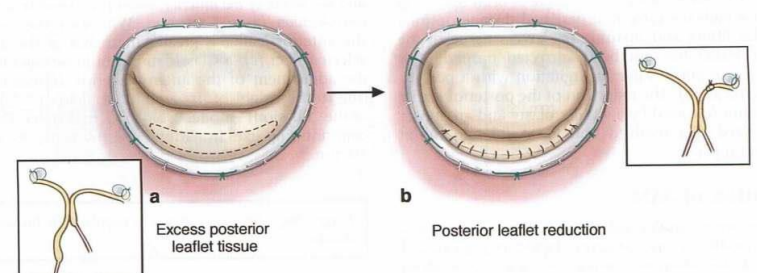
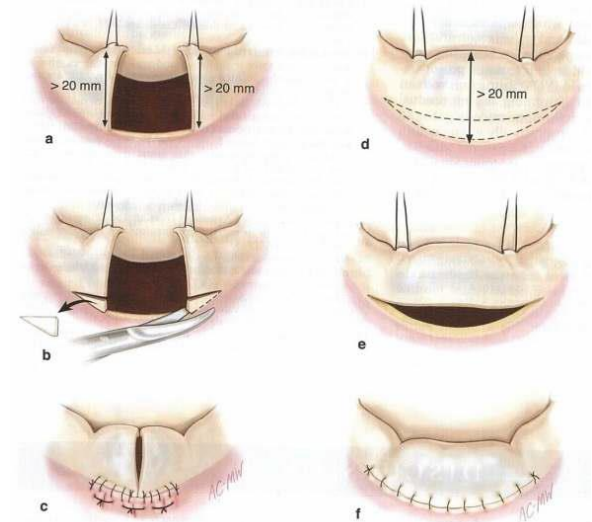
Flexible >> rigid ring

- Sliding annuloplasty:

: posterior leaflet height ↓

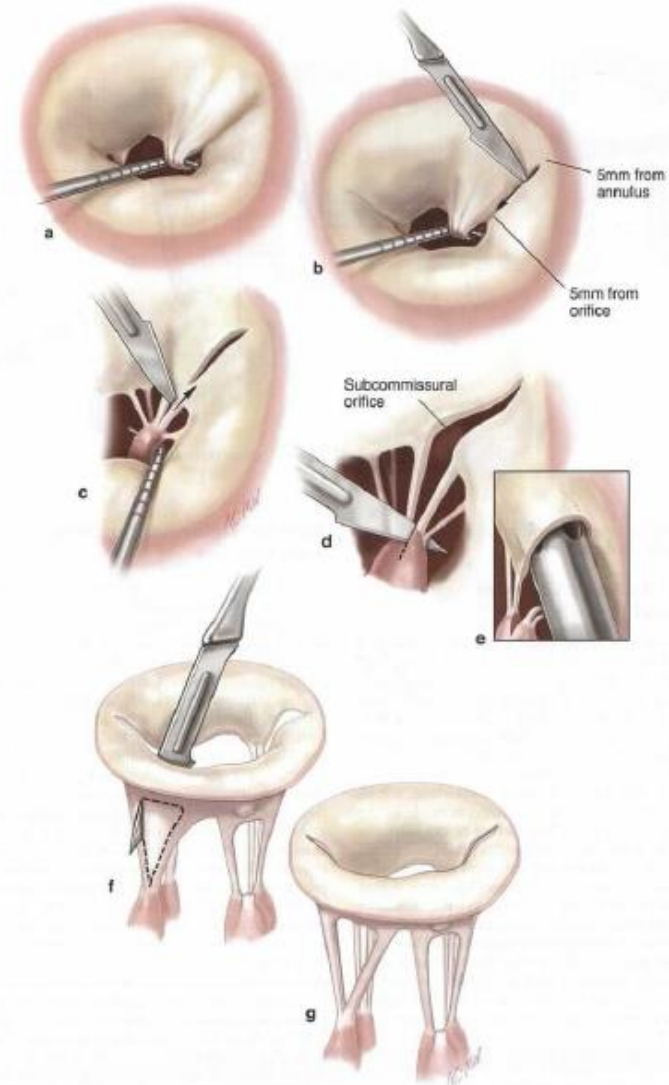
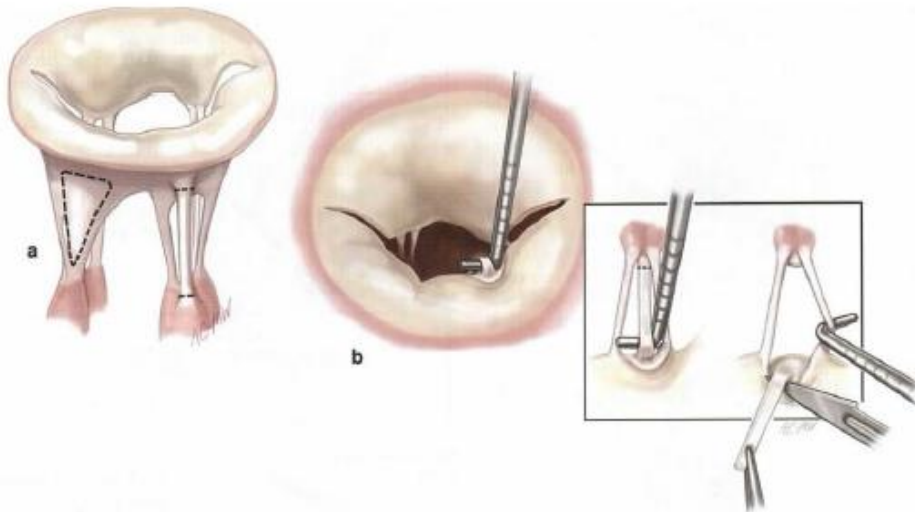
- Pomeroy procedure: ant. leaflet resection

- Transaortic septal myectomy



Rheumatic MV disease

- Commissurotomy
- 2ndary chordae resection
- Not good result
in severe deformity valve



Rheumatic MV disease

- Leaflet extension : pericardium

