RAMA UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF NURSING SCIENCES

By- SUDHA BENJAMINI
Associate Professor
Faculty of Nursing

RHEUMATIC HEART DISEASE

Objectives

- Define Rheumatic fever and rheumatic heart disease.
- Describe the etiology, risk factors, clinical manifestations, diagnostic criteria and management of RHD.
- Explain the pathophysiology of RHD.
- Describe the management of RHD.

Introduction

Rheumatic fever is a diffuse inflammatory disease characterized by a delayed response to an infection by **group A beta hemolytic streptococci** (GABS) in the tonsilopharyngeal area, affecting the heart, joints, central nervous system, skin and subcutaneous tissues.

Rheumatic heart disease condition caused by rheumatic fever that can be prevented and controlled.

Definition

- Rheumatic heart disease is a chronic condition resulting from rheumatic fever which involves all the layers of the heart (pancarditis) and is characterized by scarring and deformity of the heart valves.
- The commonest valves affecting are the mitral and aortic also affects all four valves either results in stenosis or regurgitation.

Etiology

- Group A beta hemolytic streptococcus.
- Rheumatic fever
- Everyday oral activities such as brushing and chewing food
- An infection or other medical condition such as skin sore, gum diseases and sexually transmitted disease.
- Weakened immune system
- Certain dental procedures.

Risk factors

- Poor socio economic status
- Over crowding
- Age appears most commonly in children between the age of 5 to 15 years.
- Climate and season
- Upper respiratory tract infection
- Previous history of rheumatic fever
- Genetic predisposition

Pathophysiology

Causative agent (Group A Beta hemolytic streptococci)

↓

Untreated strep throat

↓

Rheumatic fever

↓

All layers of the heart and the mitral valve become inflamed

Pathophysiology

Vegetation forms

↓

Chordae tendinae shortening, leaflet thickeninng, commisural fusion of valve leaflets

↓

Valvular regurgitations and stenosis

↓

Heart failure

Clinical manifestations

Major manifestations:

- J-Joint inflammation- Polyarthritis
- O- Carditis inflammation of the layers of the heart
- N-nodule formations under the subcutaneous tissue.
- E-Erythema marginatum map like non pruritic lesions on skin
- S-Sydenham's chorea neurological manifestation.

Clinical manifestations

Jones Criteria: Major Criteria

- ✔ Carditis
- ✔ Mono or polyarthritis
- ✔ Chorea (sydenham's chorea)
- ✔ Erythema marginatum
- ✔ Subcutaneous nodules

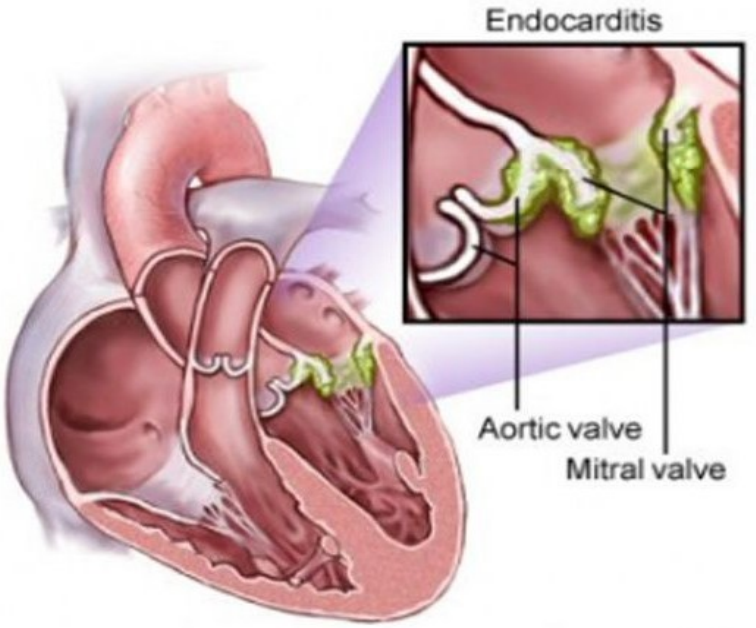
Minor Criteria

- ✔ Fever
- ✔ Polyarthralgia
- ✔ Elevated ESR, WBC & CRP
- ✔ ECG – prolonged P-R interval

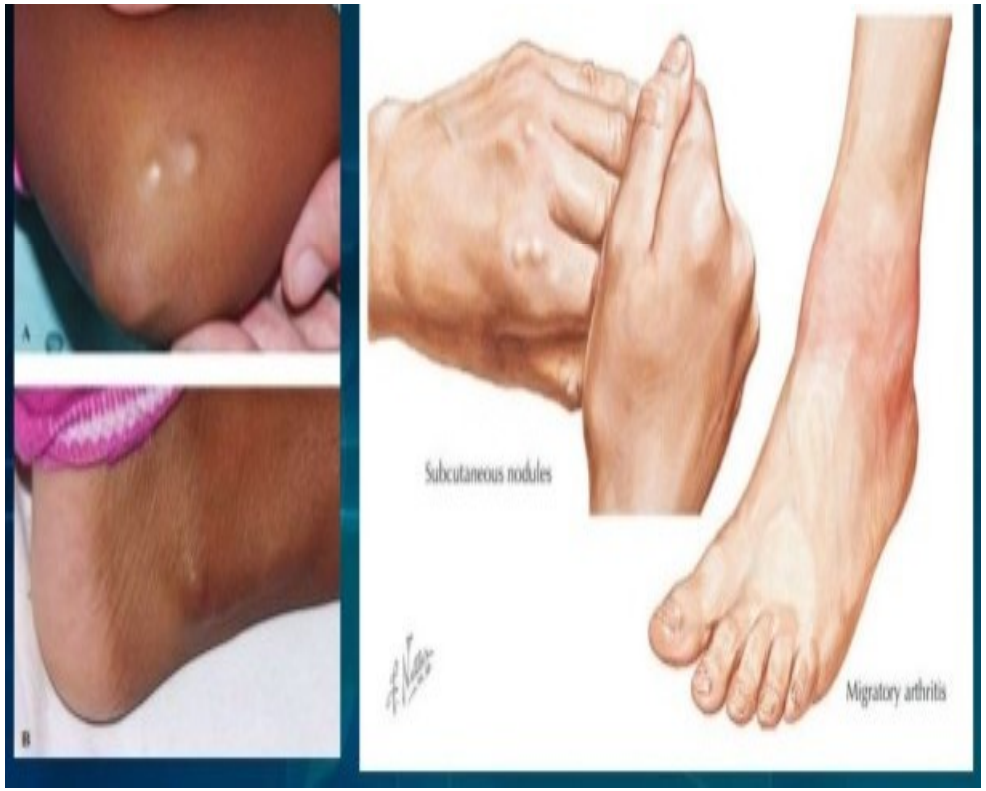
Major criteria

Arthritis

Carditis



Subcutaneous Nodule



Erythema Marginatum

Minor manifestations

- C- Increased C reactive protein
- A- Arthralgia
- F- fever
- E- Epistaxis, Increased erythrocyte sedimentation rate.

Diagnostic evaluation

- Modified Jones Criteria is used for diagnosing RHD
- 2 Major + Essential criteria
- 1 Major+ 2 Minor + Essential criteria
- Along with evidence of streptococcal infection.

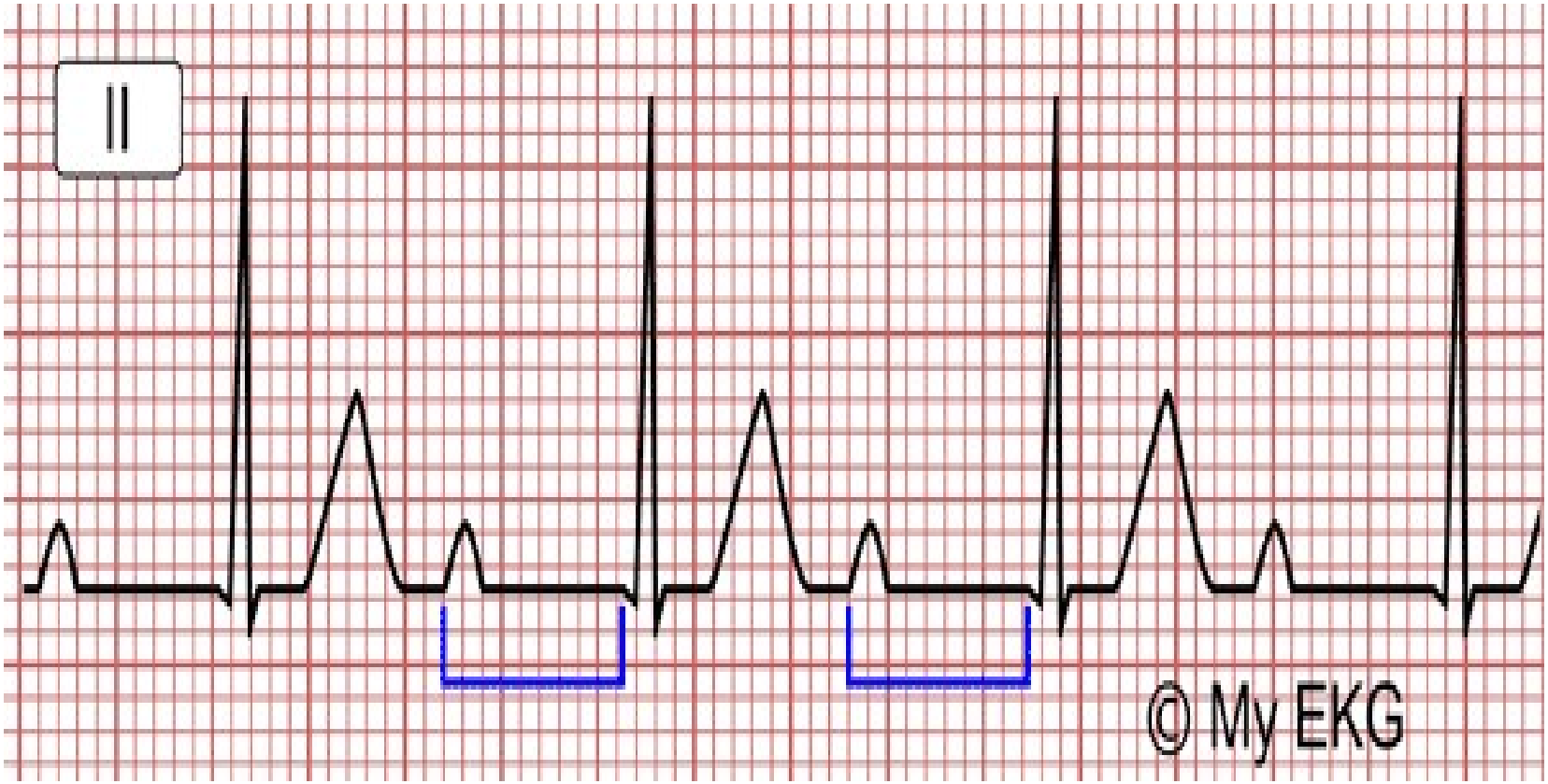
Laboratory investigations

- High ESR
- Anemia, leucocytosis, Aschoff bodies present in pericardium, perivascular regions of myocardium, endocardium
- Elevated C-reactive protein
- Elevated ASO or other streptococcal antibody titer

Laboratory investigations

- Anti-D Nase B test
- Throat culture-GABH streptococci
- ECG: prolonged PR interval
- Chest x ray
- Echocardiography, Cardiac catherization.

Prolonged P-R interval



Management

Antibiotic therapy:-

- Oral penicillin 500 mg BD x 10 days OR
- A single dose of Benzathine penicillin 1.2 million units I/M
- Tab. Erythromycin 250 mg BD x 10 days(in case of penicillin allergy)

  (the patient should be started on long-term antibiotic prophylaxis)

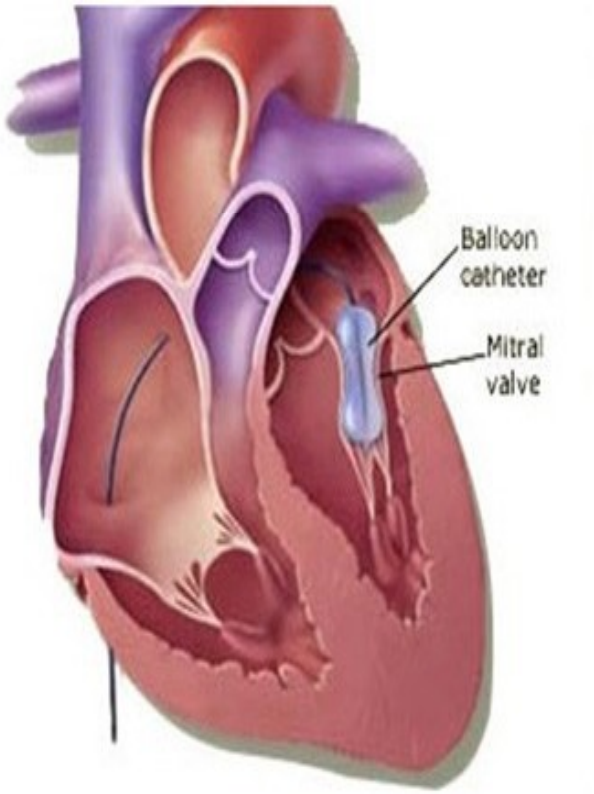
- **Arthritis , arthralgia :**
  Salicylates or NSAIDS (eg: aspirin) 80 -100 mg/kg/day in 4-5 divided doses x 3-5wks
- **Severe carditis :-**
  Corticosteroids (prednisolone 1-2 mg /kg/day ; max 60 mg x 4-6 wks, then taper 20-25 mg/wk)
- **Sydenham's Chorea :-**
  Haloperidol -0.5mg/kg/day.
  Carbamazepine or sodium valproate -15-20mg/kg/day x1-2 wks.

Treatment for Valvular Heart Disease

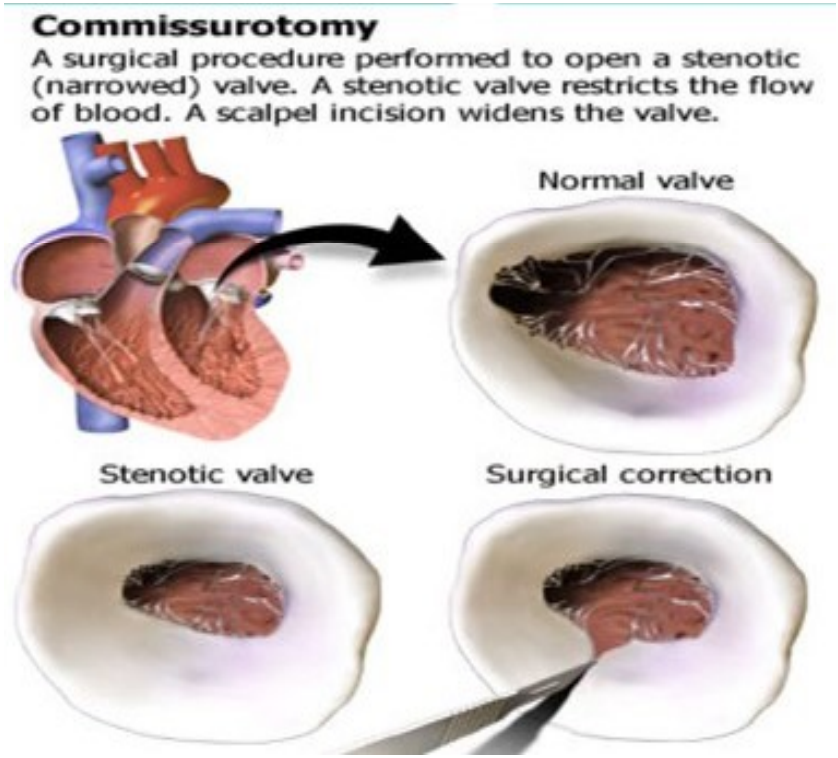
- **Medical**- digoxin, diuretics, antibiotic prophylaxis, control arrhythmias.
- **Surgical**- closed mitral commisurotomy, percutaneous transluminal ballon valvuloplasty,
- **Others** –Ross procedure, Bentalls procedure

Surgical

BALLOON VALVULOPLASTY



MITRAL COMMISUROTOMY

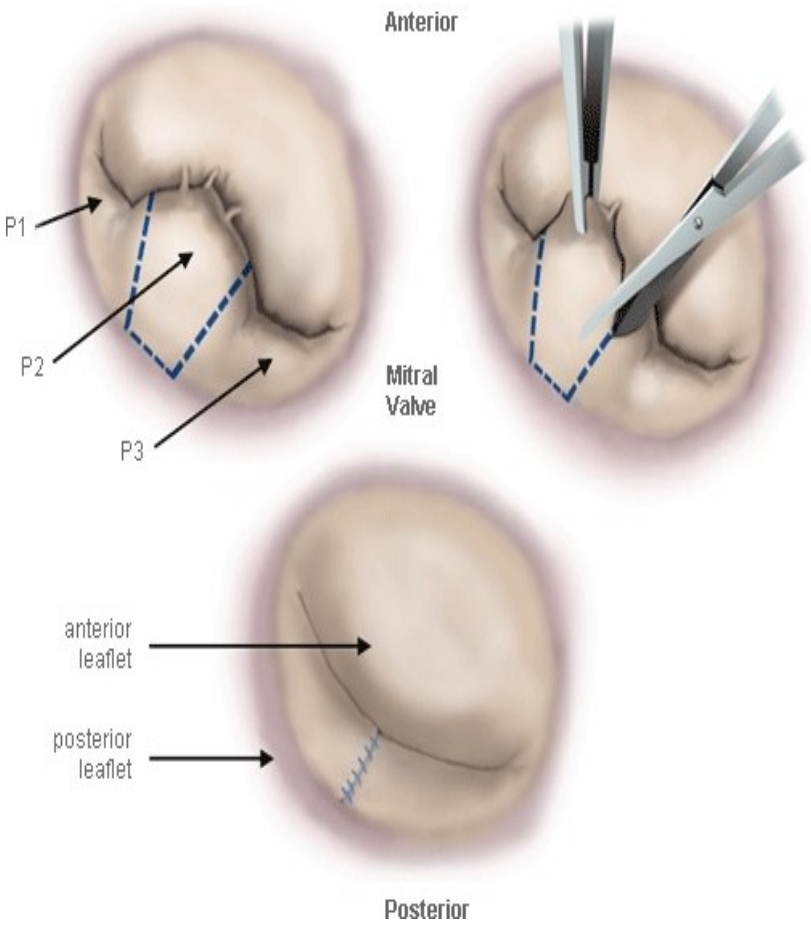


Leaflet Repair

Elongated leaflets

- ☐ Leaflet plication
- ☐ Leaflet resection
  Holes in the leaflets
- ☐ Pericardial patch repair
  Short leaflets
- ☐ Most often repaired by chordoplasty

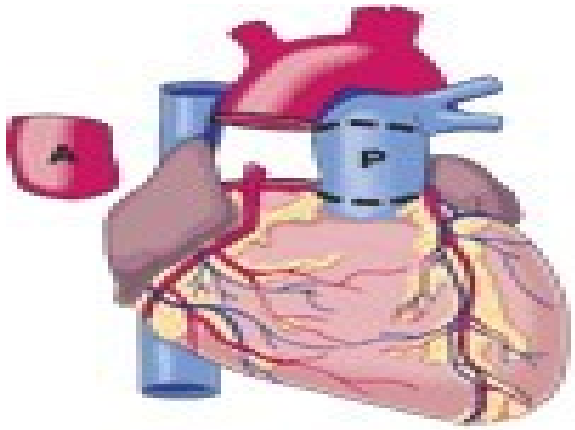
Leaflet Resection



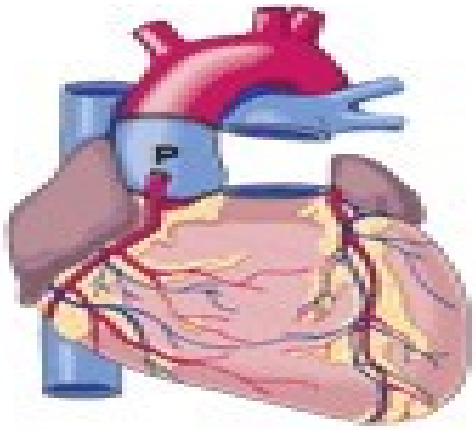
Chordoplasty

- Repair of the chordae tendinae
- Mostly used for mitral valve
- Gore-Tex can be used to create Chordae Tendinae.

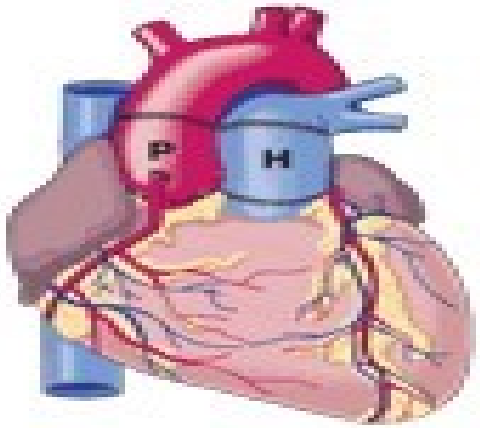
Ross Procedure



The diseased aortic valve and a portion of the aortic artery (A) are removed.

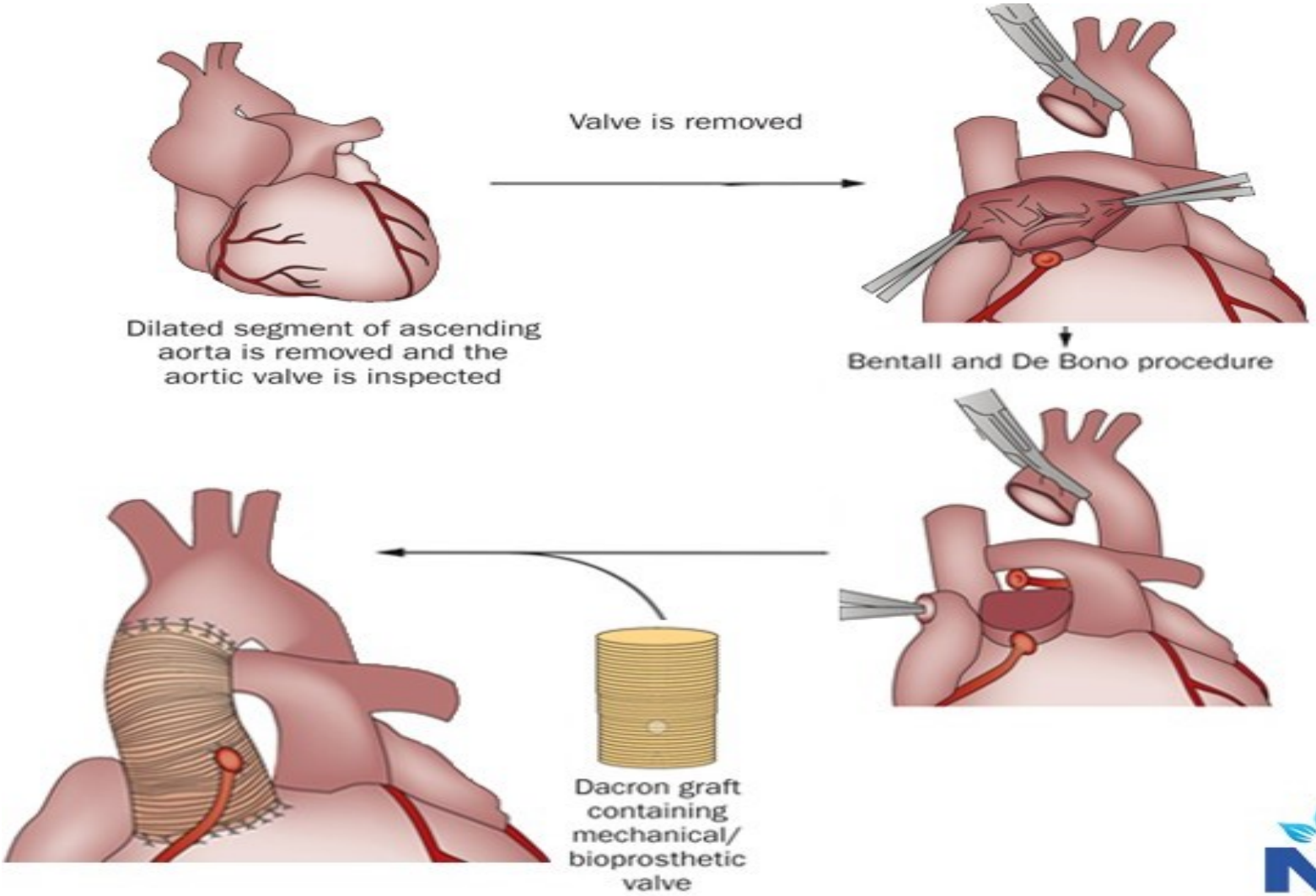


The pulmonic valve and a portion of the pulmonic artery (P) are excised and placed in the aortic position. The left and right main coronary arteries are attached to the pulmonary artery (P).



A homograft (allograft) pulmonary valve and portion of artery (H) are placed in the pulmonary position.

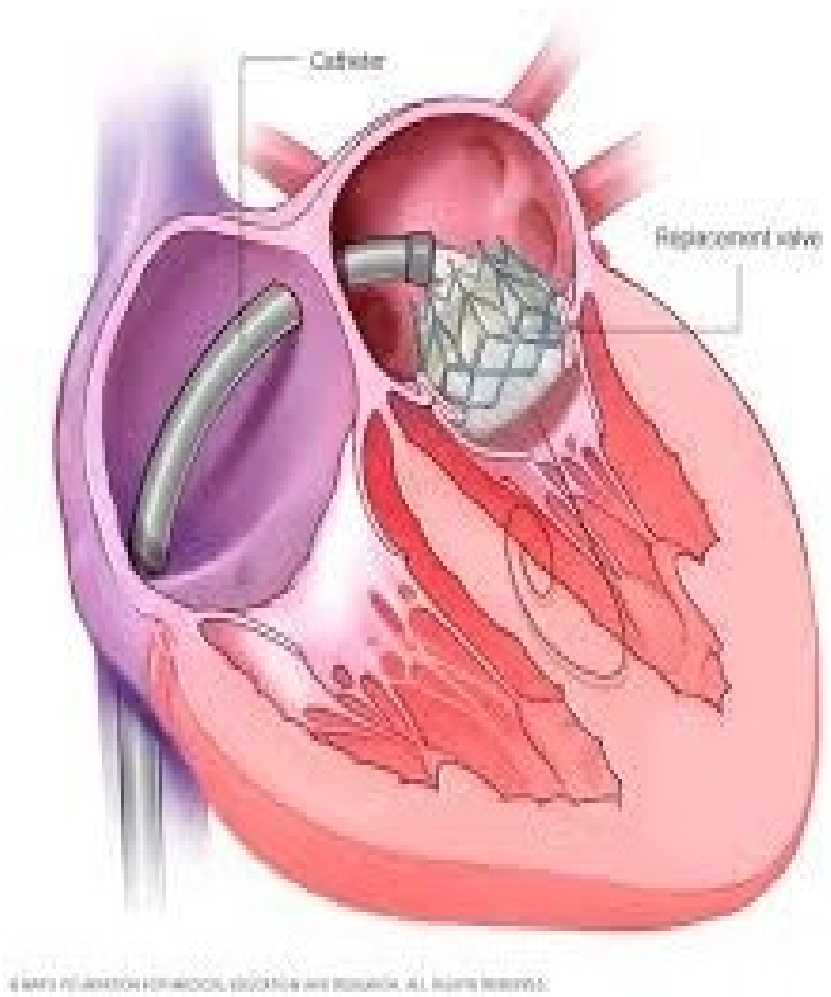
Bentall Procedure



Valve Replacement

Process :

- Performed when valvuloplasty is not suitable
- Approached through a median sternotomy or mitral valve (at times) – right thoracotomy incision



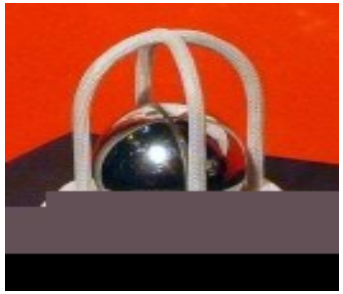
Types of prosthetic valves

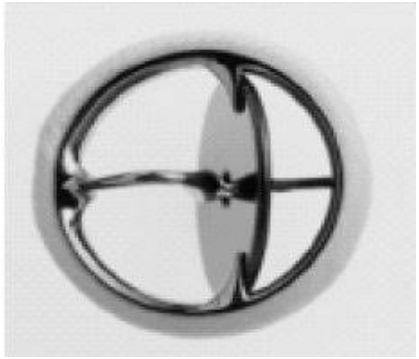
MECHANICAL VALVES

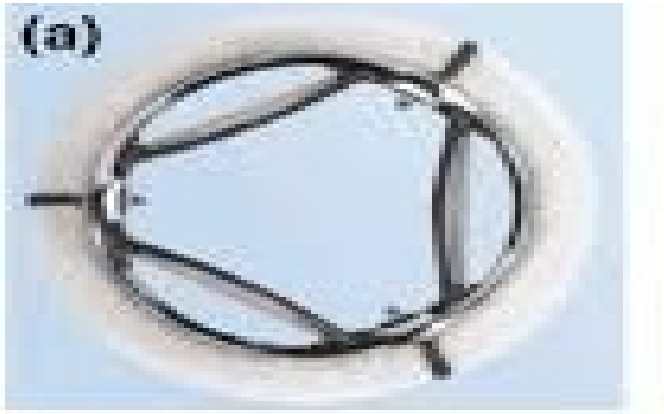
TISSUE BIOLOGIC VALVES

Types Of Mechanical Valves

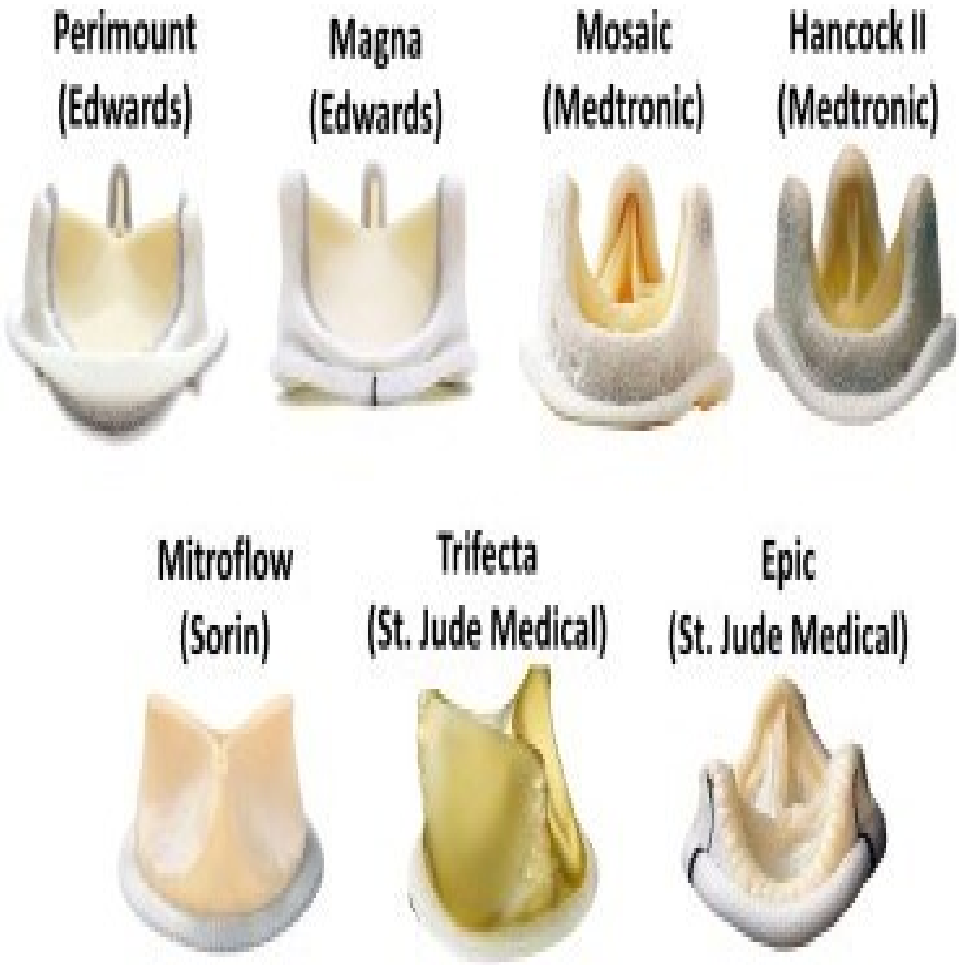
- Caged ball valve (Starr-Edwards)
- Tilting disc valve (Med trionic-Hall)
- Bileaflet valve(St. Jude Medical)
- Trileaflet valve







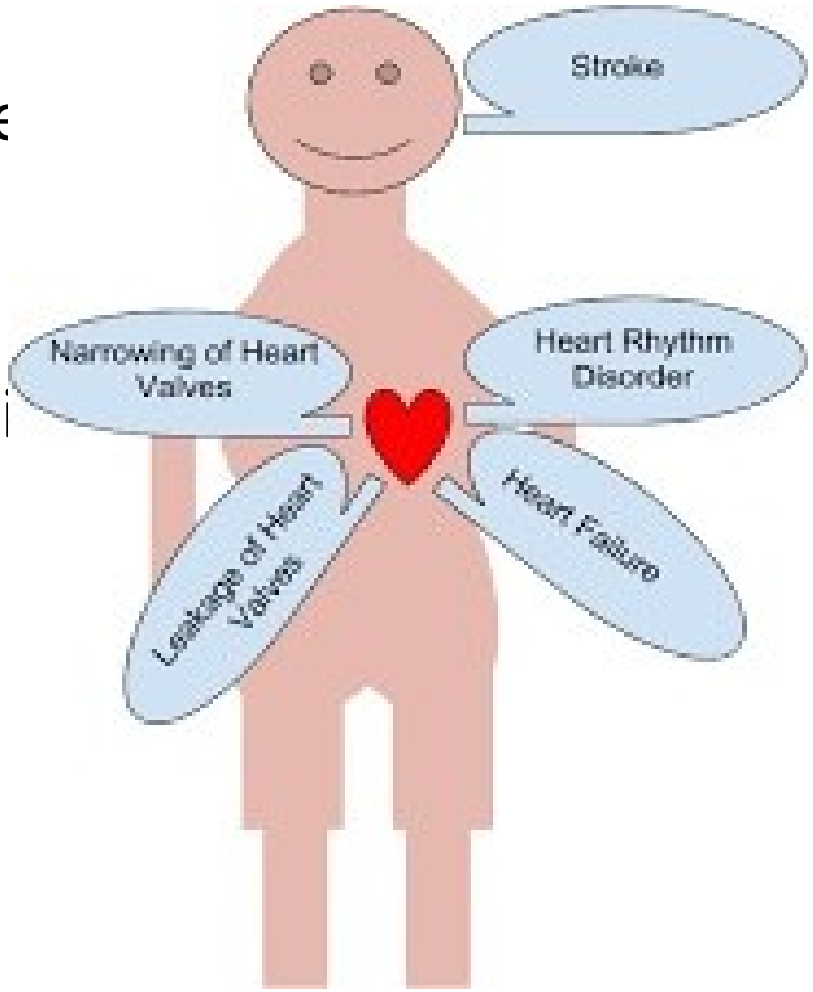
Next generation of mechanical valve: trileaflet valve



- More physiological better hemo dynamics central blood flow'
- Reduced thrombosis risk

Complications

- Congestive heart failure
- Infective endocarditis
- Arrhythmias mainly atri
- Embolic episodes
- Cardiomegaly



Nursing Management

1.Ineffective breathing pattern R/T altered hemo dynamics

- Assess the alteration in lung function like hypoxemia, atelectasis,abnormal lung sounds, work of breathing etc.
- Monitor ABG
- Position properly for maximum lung expansion.
- Administer O2 therapy.
- Teach deep breathing and coughing.
- Schedule activities to conserve energy.
- Medications for pain to prevent tachypnea

2. Fluid volume excess R/T CHF

•Observe and assess clinical signs that indicate impending or present heart failure.

- Monitor patient's intake and output.
- Weigh the patient daily.
- Take abdominal girth measurements if abdominal distention or ascitis is present.
- Provide rest periods, administer prescribed medications

3. Decreased CO R/T altered hemodynamics as manifested by fatigue, dizziness or syncope

- Assess, document and report signs of decreased CO such as decreased systolic BP, increased HR, presence of murmurs, decrease urine out put, cool clammy skin etc.
- Position the patient properly.
- Administer medications as prescribed.
- Explain the need to limit activities.

References

- Suzanne C , Brenda G. Textbook of medical surgical nursing,2003;9
- Black J M, Hawks J H . Medical surgica nursingg,2005;7
- Woods S L .Cardiac nursing,1995;3;847-850
- www.medicalcriteria.com
- www.wikipedia.com
- www.emedicine.medscape.com