

Carcinoid and other valvulopathies

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Disclosures

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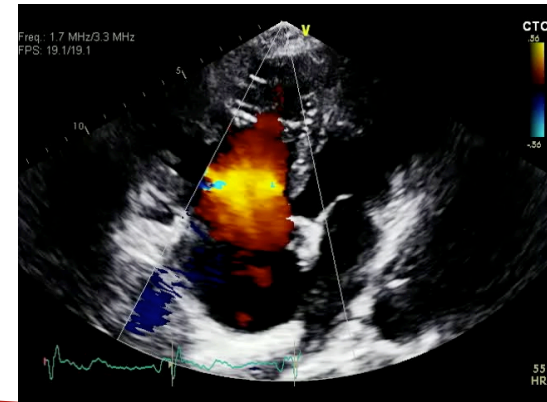
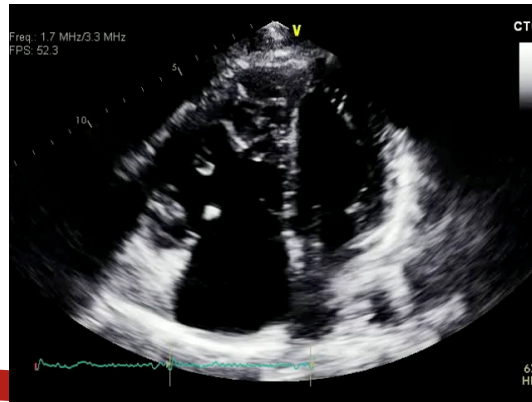
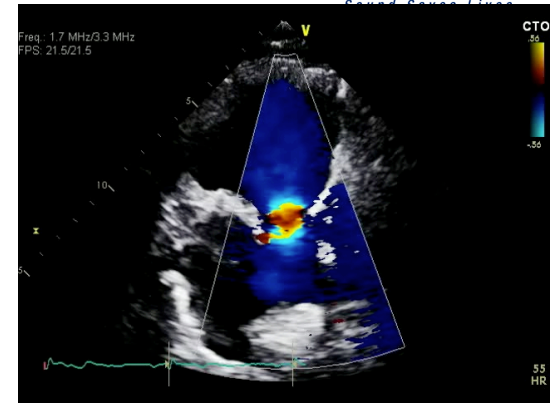
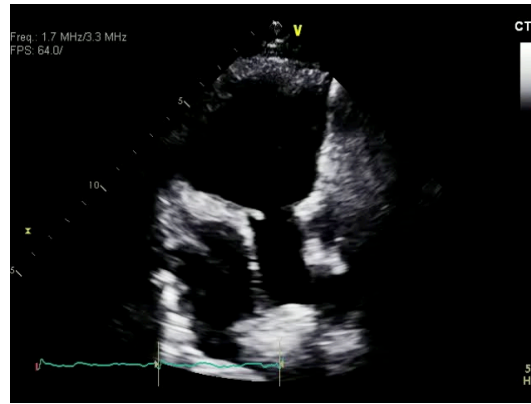
Objectives

Use cases to review the epidemiology, pathophysiology and imaging on patients with valvulopathies from systemic disease

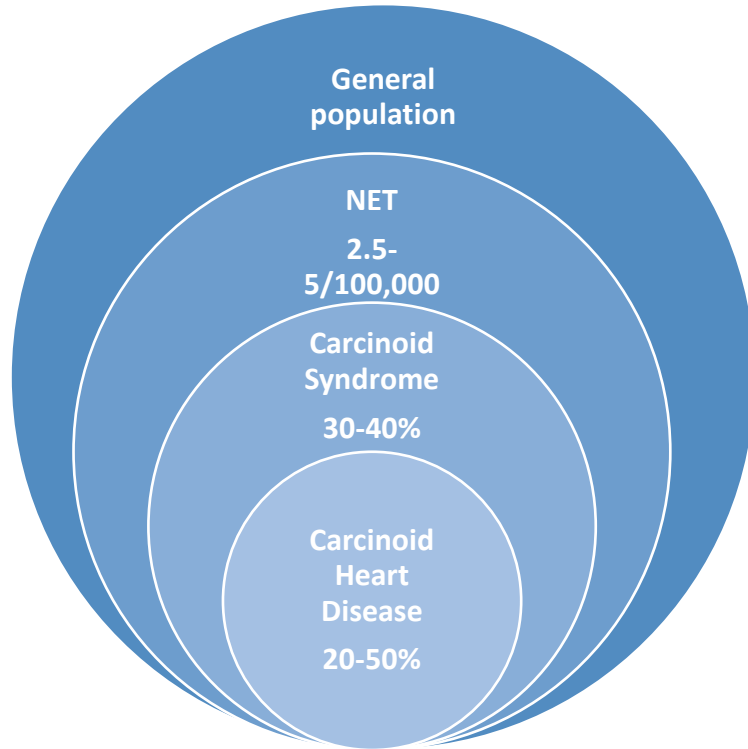
- Carcinoid heart disease
- Libman-Sack endocarditis

Case

- 60 y.o. M
- Increasing shortness of breath
- Recently diagnosed with a NET with liver involvement
- 24-hour urinary 5-HIAA 480 mmol
- NT-proBNP 630 pg/ml



Carcinoid Heart Disease

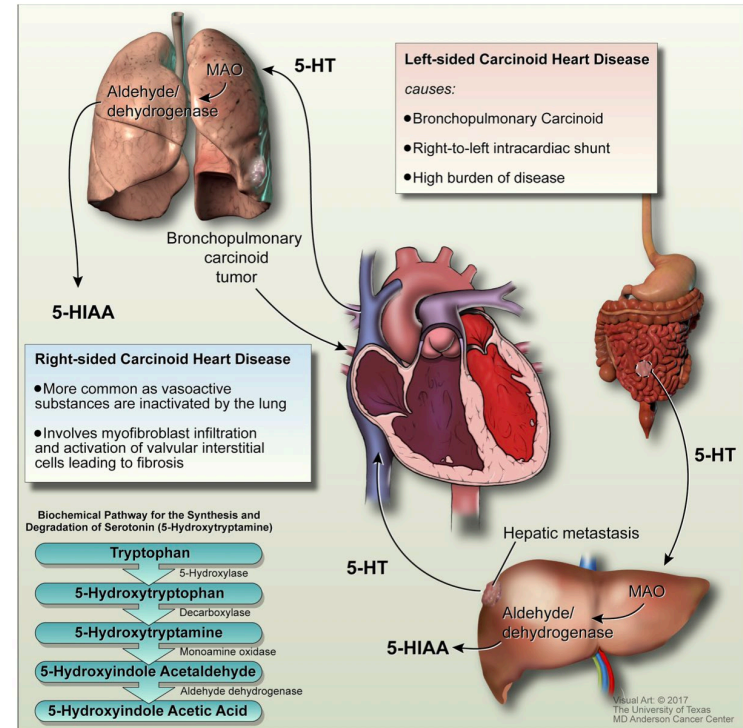


Carcinoid syndrome

- Vasomotor changes (flushing, hypotension, less commonly hypertension)
- Diarrhea
- Bronchospasms

Carcinoid Heart Disease

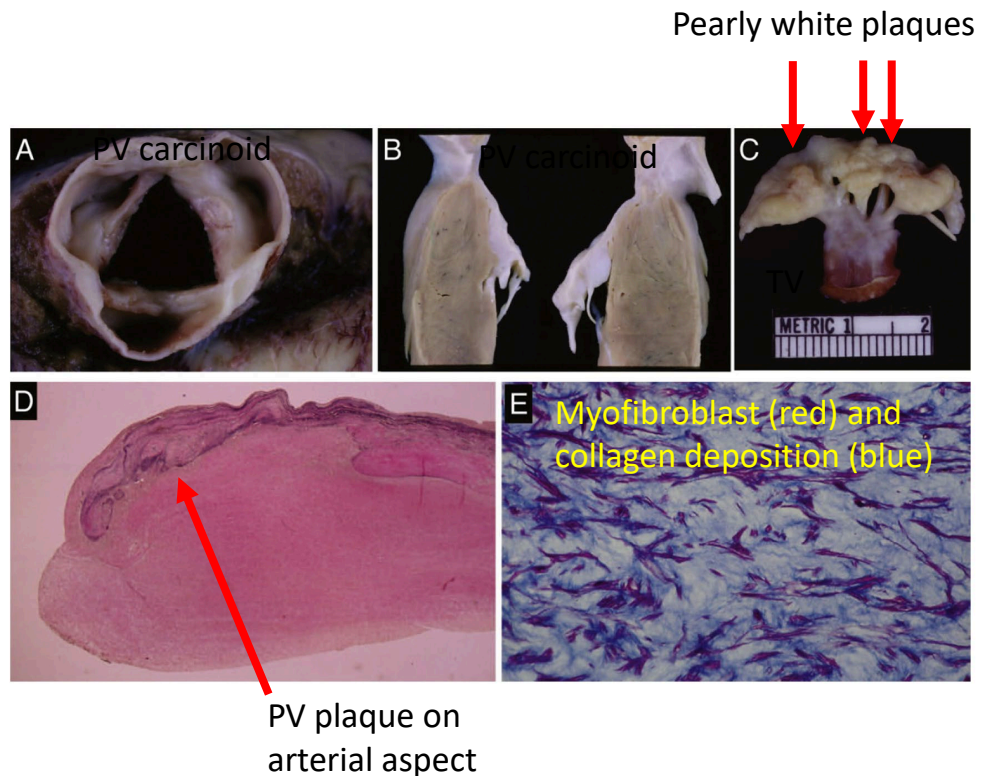
- **Carcinoid syndrome** occurs in most when tumors have metastasized to the liver as the vasoactive substances reach the systemic circulation via the hepatic vein
- Those with primary ovarian, pulmonary, or midgut carcinoid with retroperitoneal metastases can present without liver mets (~5% of cases)



Carcinoid Heart Disease

Carcinoid deposits affect:

- Tricuspid valve
 - Pulmonary valve
 - Cardiac chambers
 - Pulmonary artery
 - Vena cava
 - Coronary sinus
-
- 5-10% left sided involvement
 - Carcinoid plaques are composed of smooth muscle cells, myofibroblasts, extracellular matrix, overlying endothelial layer



Carcinoid Heart Disease

Epidemiology of carcinoid heart disease

5th to 7th decade of life

High degree of suspicion for cardiac involvement as a majority with significant involvement are asymptomatic

Usually diagnoses ~1.5 years after NET diagnosis

TABLE 2 Clinical Features of Carcinoid Heart Disease

Dyspnea
Fatigue
Systolic murmur heard best along the sternal border, increases with inspiration
Jugular venous pressure elevation with a prominent V-wave
Ascites, peripheral edema, and pleural effusion. Possible causes include: <ul style="list-style-type: none">• Cardiac/pulmonary• Hepatic• Nutritional• Intra-abdominal causes of venous obstruction by tumor• Combination of the previously listed causes

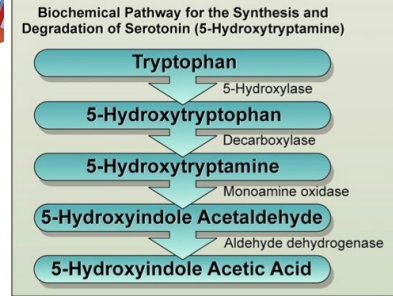
Investigations

Carcinoid disease diagnosis

- 24-hours urinary excretion of 5-hydroxyindole acetic acid (5-HIAA)
- Can also use serum 5-HIAA

Carcinoid heart involvement

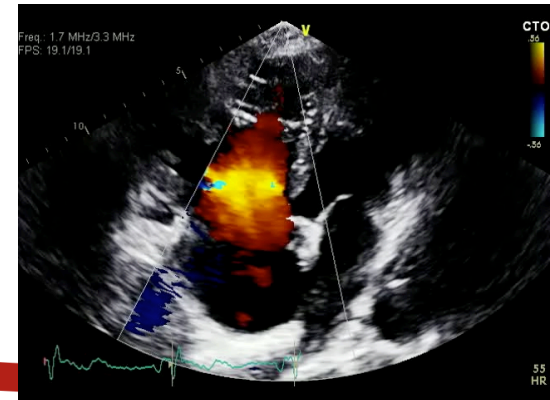
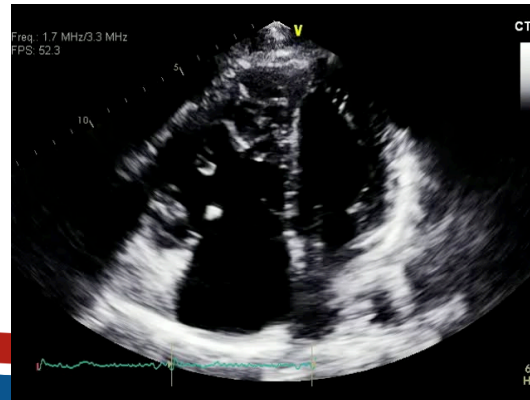
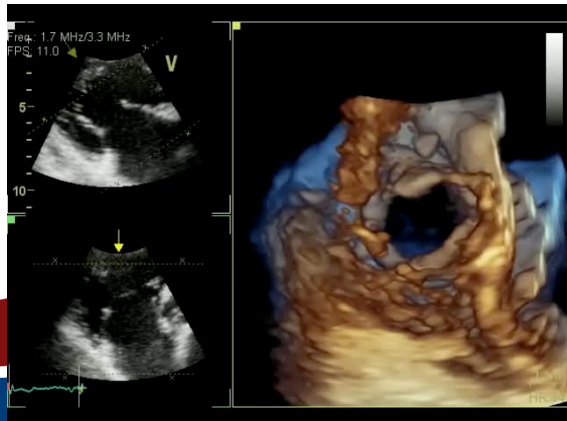
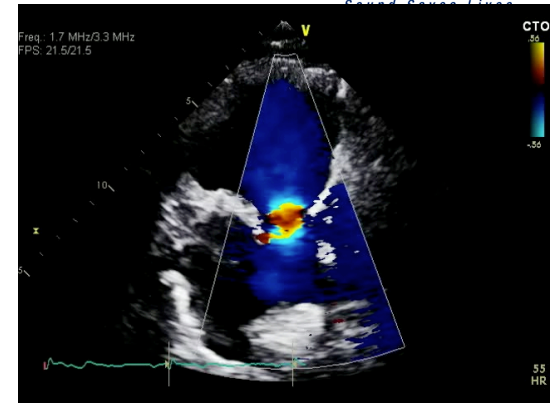
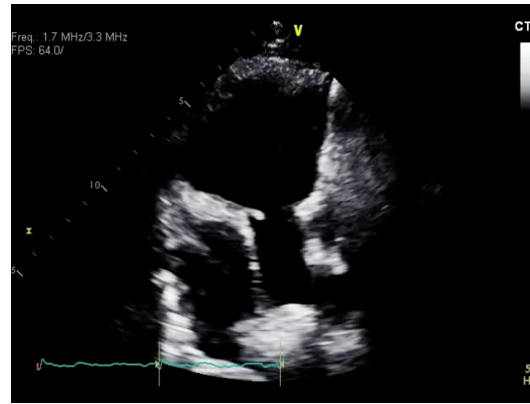
- 5-HIAA >300 mmol/24 h suggests cardiac involvement
- NT-proBNP greater than 260 pg/ml (31 pmol/l) can be used as a screening tool
- Chromogranin A



Carcinoid Heart Disease

Echocardiography

- Diagnosis and follow-up (3-6 months or change in status)
- Fixed, thickened, retracted leaflets
- Regurgitation > stenosis



Carcinoid Heart Disease

CMR

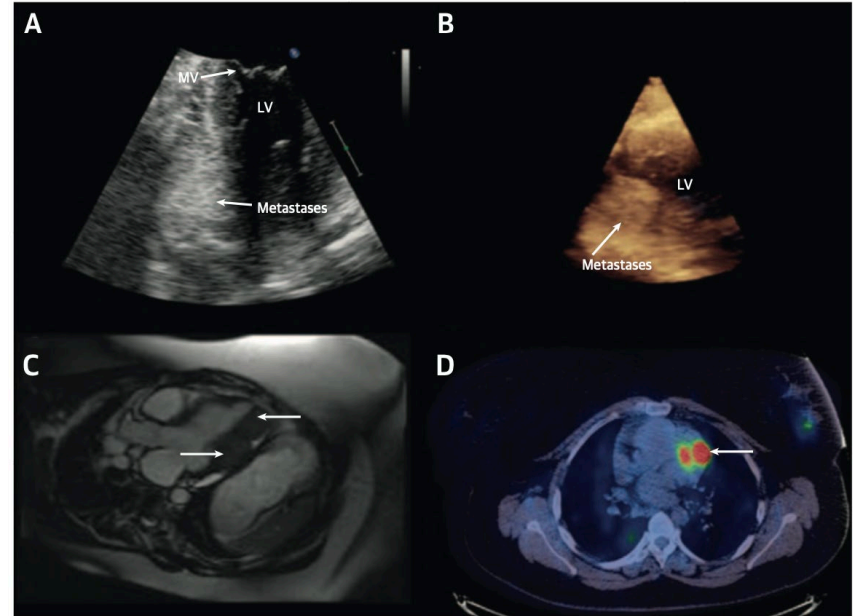
- Pulmonary involvement
- Myocardial metastases
- RV size and function

CT

- Valve assessment
- Myocardial metastases
- Coronaries

PET

- Metastases



Carcinoid Heart Disease

Prognosis

Carcinoid from NET - depends on location of the primary tumor, histological grade, and disease stage

- Untreated

Disease Stage	No Treatment	Somatostatin Analogue Effect
Low grade localized tumor	124 months	No significant change
Poor/undifferentiated with metastases	5 month	Improves survival

Those with cardiac involvement tend to have more advanced disease

- With NYHA III/IV symptoms - median survival 11 months
- Cardiac progression predicted by high 5-HIAA levels and flushing episodes
- Cardiac progression can be fast (<6 months) in ~65% of patients

Carcinoid Heart Disease

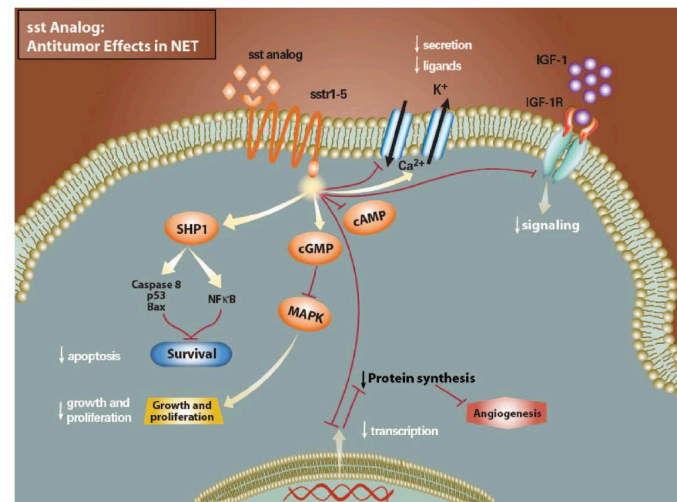
Management - Team Approach

1. Pharmacologic therapy for heart failure

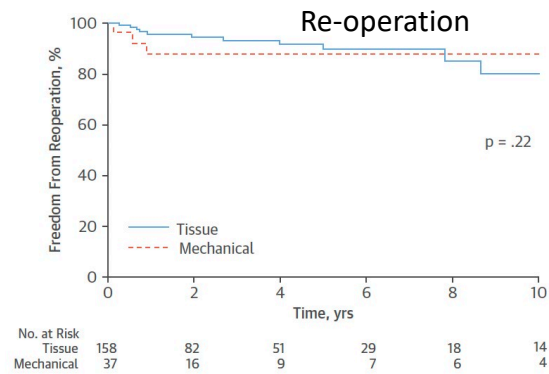
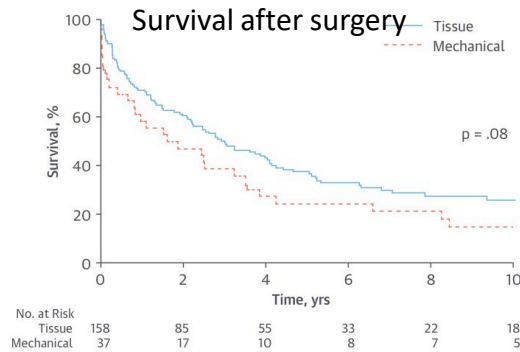
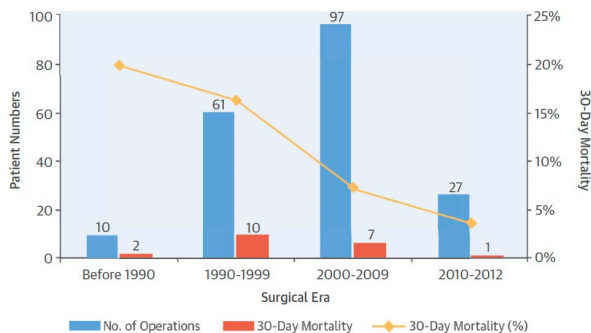
2. Control of carcinoid symptoms

- Somatostatin analogues (octreotide) to lower 5-HIAA levels to <300 mmol/24 hours
- Interferon alfa
- Peptide receptor radionuclide therapy
- Transcatheter arterial embolization or chemoembolization in those with predominantly liver mets before cardiac involvement
- Surgical debulking after heart valve surgery

Effects of somatostatin analogues on NET



Carcinoid Heart Disease

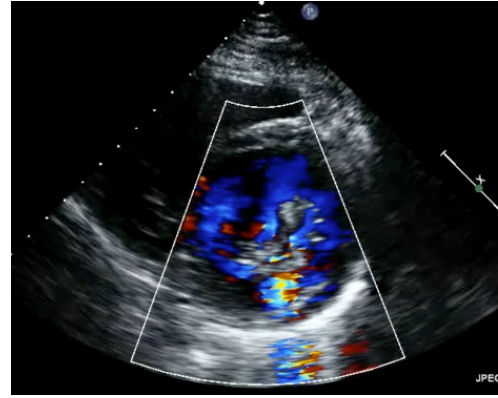
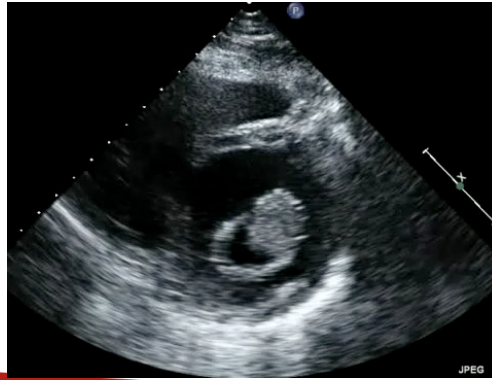
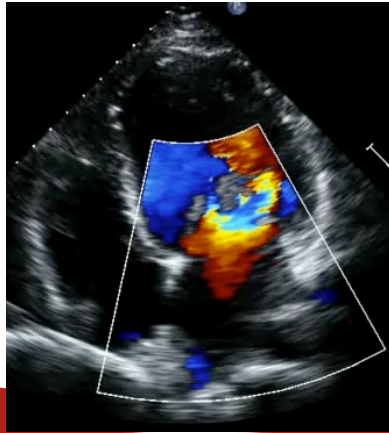
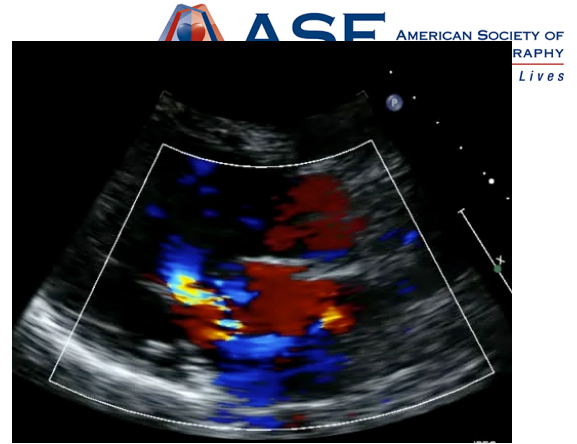


3. Cardiac valve replacement

- Surgery as per valve guidelines if tumor progression and comorbidity allow for an expected survival over 1 year
- After cardiac surgery, 1-, 5-, and 10- year survival 69%, 35%, 24%
- Pre-symptomatic valve operation is not associated with late survival benefit
- Bioprosthetic valve replacement preferred as life expectancy is limited, reoperation rare, and chronic warfarin therapy may not be tolerated
- To prevent a carcinoid crisis, IV octreotide infusion should be started at least 12 h preoperatively and continued throughout the procedure until stable. Monitored for bradycardia if high doses of octreotide are used

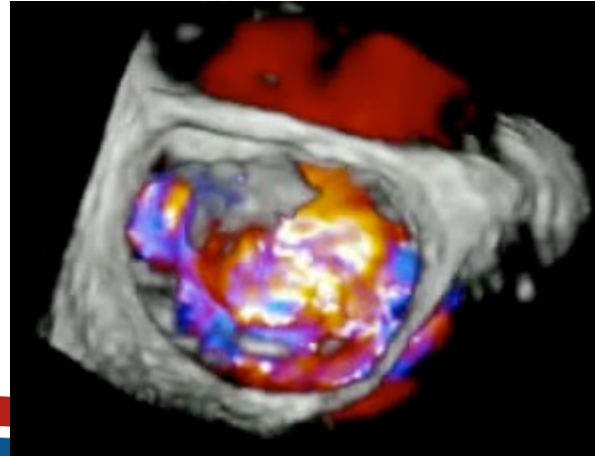
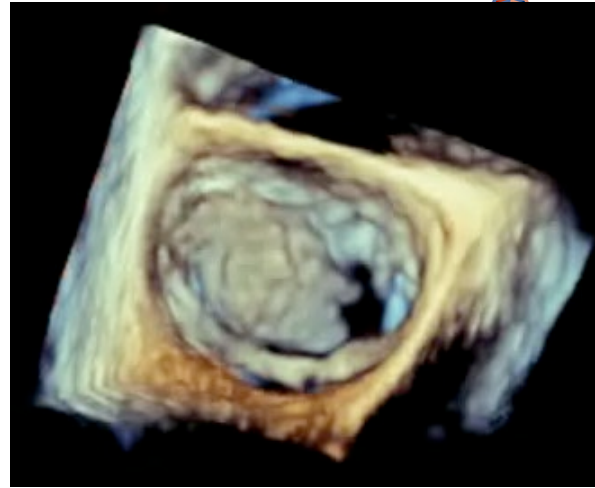
Case

- 20-year-old male with history of SLE and APAS
- Presents with left arm tingling



Case

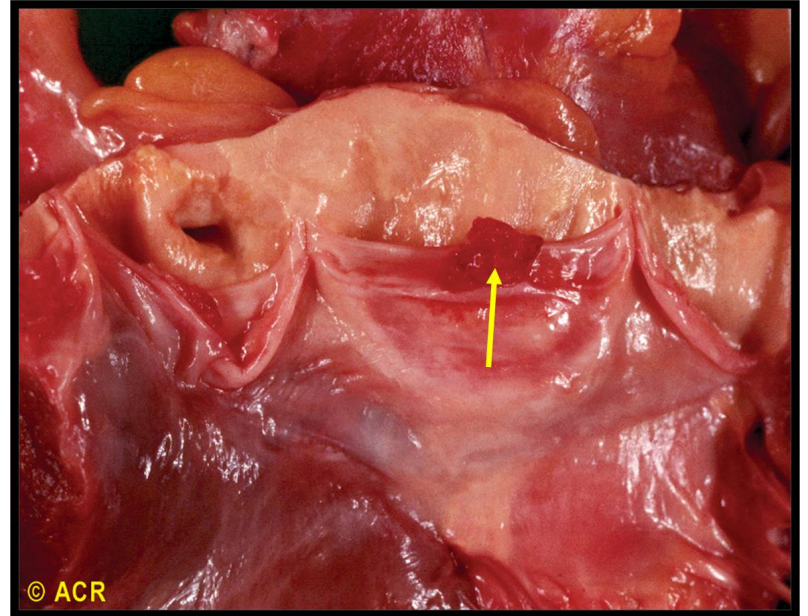
- CT demonstrated multiple brain infarcts
- Emergent OR for tissue MVR
- Pathology: Thrombus, old and new with features of organization → Non thrombotic bacterial endocarditis



Libman-Sack Endocarditis

- Non-bacterial thrombotic endocarditis
- Also known as
 - Marantic endocarditis
 - Verrucous endocarditis
- Sterile valve lesions

AV Libman-Sacks endocarditis lesion



Libman-Sack Endocarditis

Associated with hypercoagulable states

- Inflammatory disease
 - Systemic lupus erythematosus (SLE)
 - Those with SLE and APAS have a higher incidence
 - Ankylosing spondylitis
- Thrombotic disease
 - Antiphospholipid antibody syndrome (APAS)
- Malignancies
 - solid tumors (adenocarcinoma of the pancreas, colon, ovary, lung, biliary, and prostate)
- Other
 - Disseminated intravascular coagulation
 - Sepsis

Histopathology of Verrucae

- Occurs from endothelial injury in the setting of a hypercoagulable state
- Active lesions have 3 zones:
 - Inner zone: neovascularization, fibrinoid degeneration & focal necrosis
 - Middle zone: organization with proliferating capillaries and fibroblasts
 - Outer zone: mononuclear cell infiltrates, small hemorrhages, and fibrin-rich platelet thrombi
- Healed lesions: dense vascularized fibrous tissue +/- calcification
- Immunofluorescence: immunoglobulin and complement deposition

Libman-Sacks Endocarditis

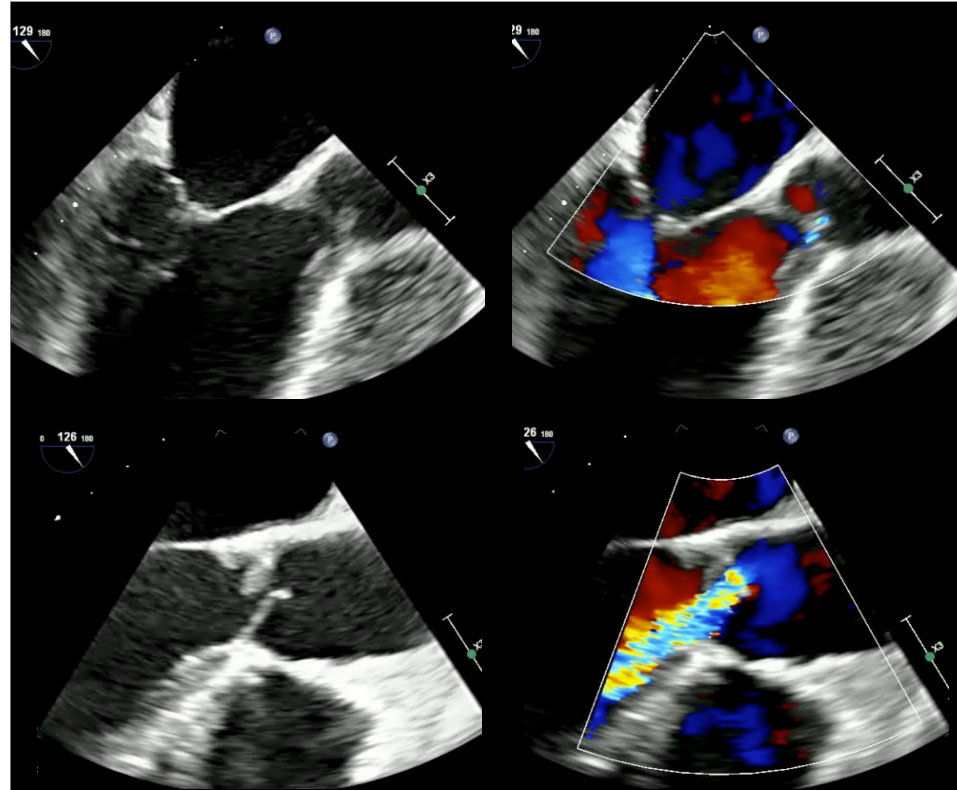
- Prevalence in SLE of 6-11% using TTE, 45-50% using TEE
- Occurs in every age group and both sexes
- Valvular lesions can occur at any time
- Presence of valvular lesions does not correlate with SLE disease activity
- No symptoms until thromboembolic event
- Rare fever
- No murmur



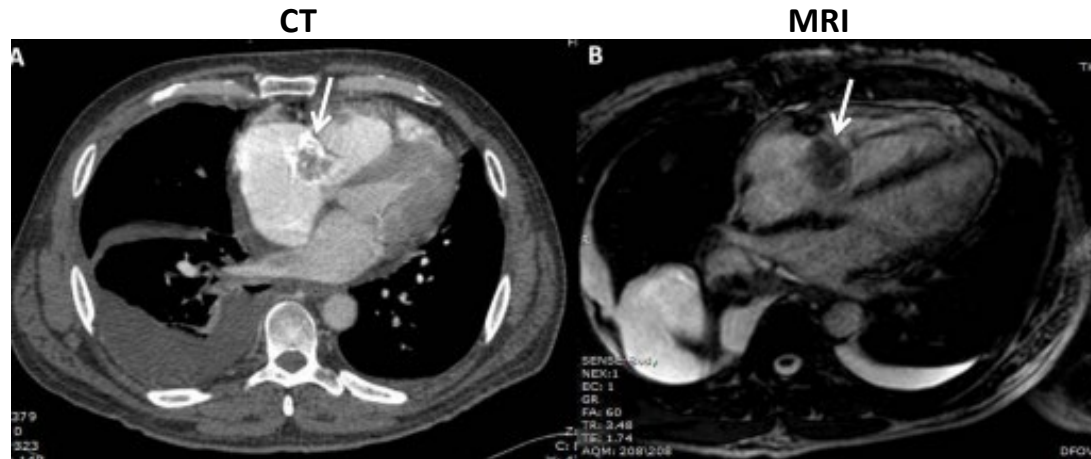
Libman-Sacks endocarditis

Echocardiogram

- Valve thickening
- Rarely significant stenosis/regurgitation/perforation
- Mitral and aortic valve most affected
- Size is mostly <10mm
- Compared to vegetations are smaller, less mobile and located on either side of the valve
- Differential include infective endocarditis, tumor, Lambl's excrescence



Libman-Sacks Endocarditis

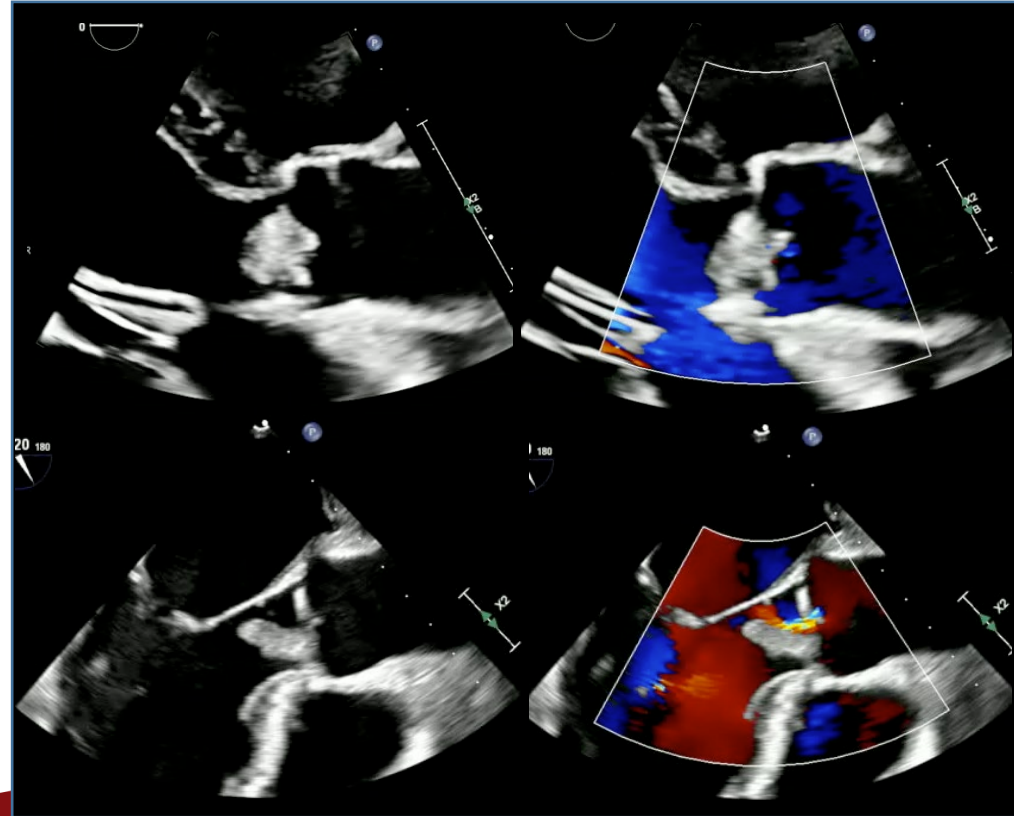


- CMR can identify myocardial involvement in SLE

Libman-Sacks Endocarditis

Management - Team approach

- Treat underlying autoimmune disease
 - No specific role for immunosuppressive therapy for valve disease
- Anticoagulation with heparin or warfarin
 - continue indefinitely
- Surgery
 - Repair when possible
 - Mechanical preferred as most will be anticoagulated
 - Steroid induced fibrosis more common with bioprosthetic valves



Summary

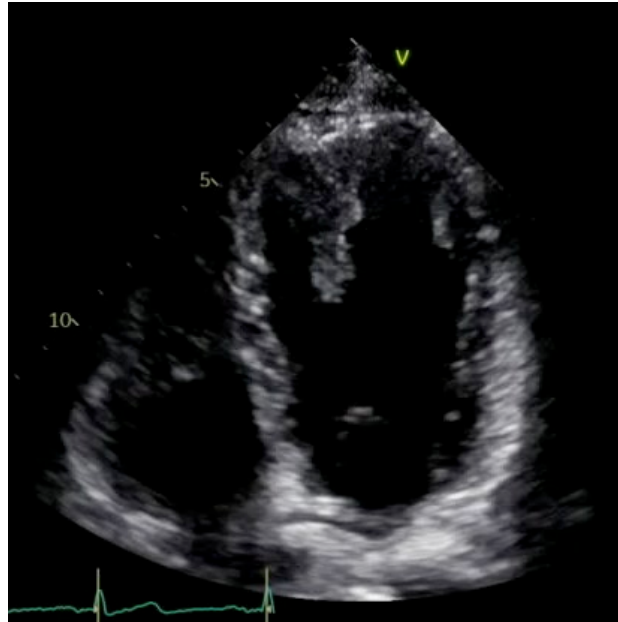
- Valve involvement in systemic diseases requires a team approach

Carcinoid Heart Disease

- Cardiac involvement in carcinoid syndrome is rare
- Diagnosis should be suspected in patients with urinary 5-HIAA > 300 mmol/24 h or NT-proBNP greater than 260 pg/ml (31 pmol/l)
- Bioprosthetic valve replacement is preferred

Libman-Sacks Endocarditis

- In SLE patients, it requires a high degree of suspicion as it is not linked to disease activity
- Management includes long-term anticoagulation with warfarin



Thank you for listening!