



# Cardiac Pathology 3:

Valvular Heart Disease,  
Cardiomyopathies,  
and Tumors

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# Cardiac Pathology Outline

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- Blood Vessels
- Heart I
- Heart II

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- Blood Vessels
- Heart I
  - Heart Failure
  - Congenital Heart Disease
  - Ischemic Heart Disease
  - Hypertensive Heart Disease

# Cardiac Pathology Outline

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- Blood Vessels
- Heart I
- Heart II
  - Valvular Heart Disease
  - Cardiomyopathies
  - Tumors

# Cardiac Pathology Outline

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- Blood Vessels
- Heart I
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  - Valvular Heart Disease

# Valvular Heart Disease

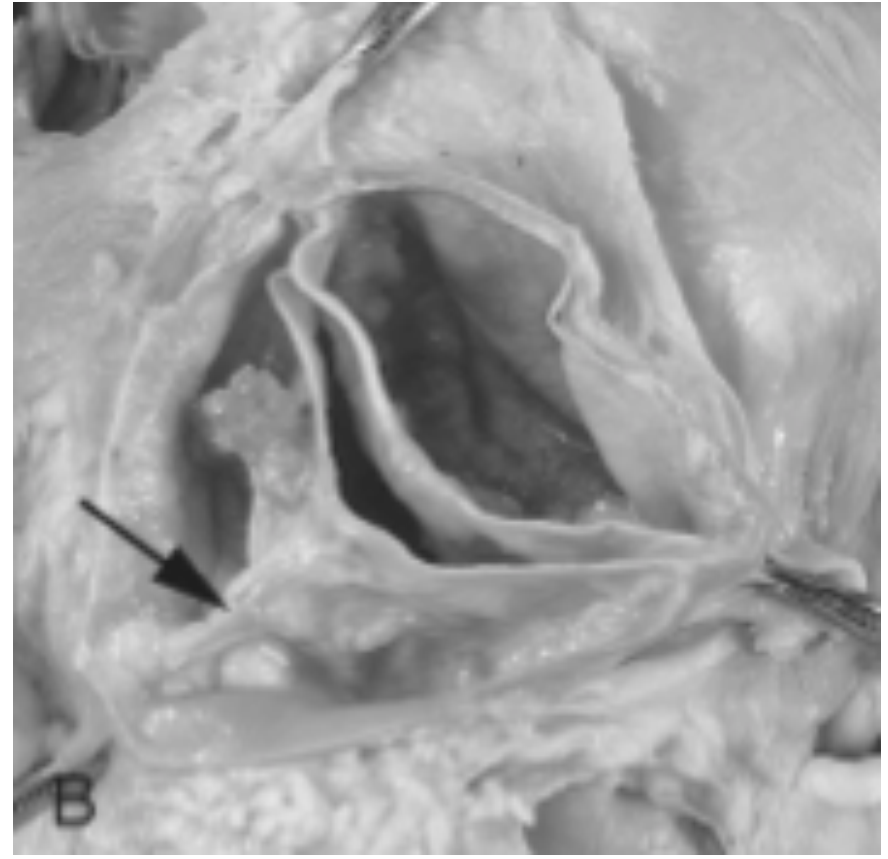
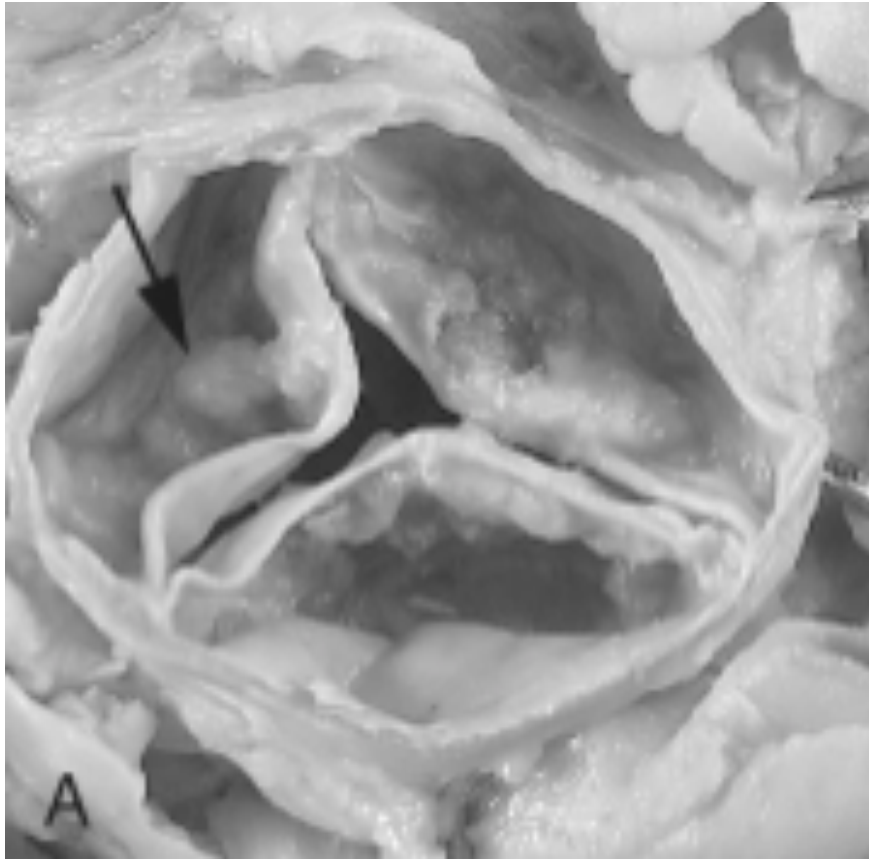
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- Stenosis and/or insufficiency
- Stenosis: failure to open
- Insufficiency: failure to close
- Murmurs
- Outcome depends on severity and speed of development

# Calcific Aortic Stenosis

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- Part of aging process
- Can occur on normal or congenitally bicuspid valves
- Results in increased LV pressure, LV hypertrophy, and relative ischemia
- Angina, CHF, or fainting



Calcific aortic stenosis: normal (L) and bicuspid (R) valves



# Mitral Valve Prolapse

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- Common (5% of adults in US, F>M)
- Ballooning of mitral leaflets
- Myxoid/mucoid change within leaflet
- Pathogenesis unknown
- Most patients asymptomatic



Mitral valve prolapse

# Rheumatic Valvular Disease

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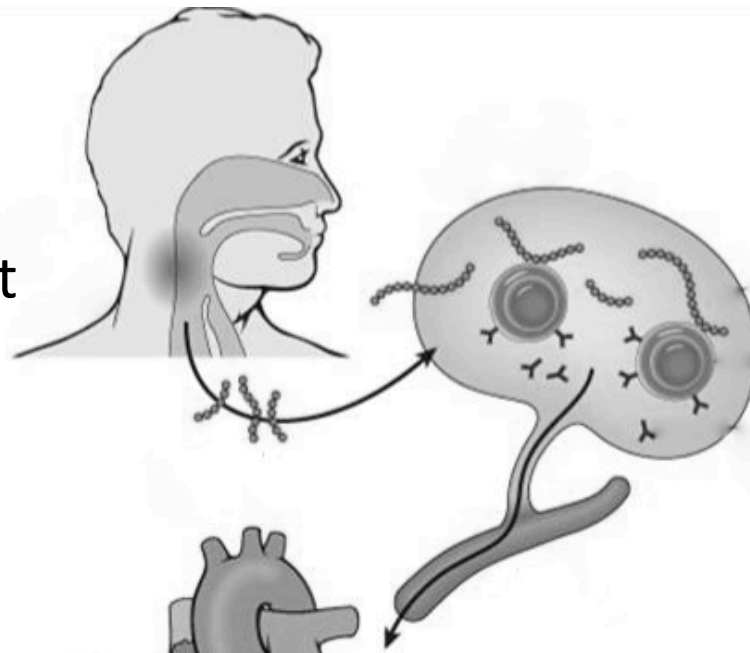
- Rheumatic fever: systemic inflammatory disease occurring a few weeks after strep throat
- Valves (esp. mitral) become scarred
- Consequence: stenosis ( $\pm$  regurgitation)

# Rheumatic Fever

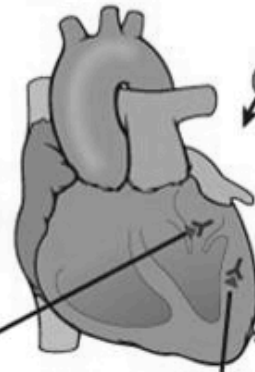
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- Body makes antibody to strep bug that cross-reacts with antigens in heart and joints
- 2-3 weeks after strep throat, patient gets:
  - migratory polyarthritits
  - pericardial friction rub, arrhythmias
- Chronic disease can reappear decades later
  - mitral stenosis, left atrial enlargement, thrombi
  - increased risk of infective endocarditis
- Long term prognosis variable

Strep throat



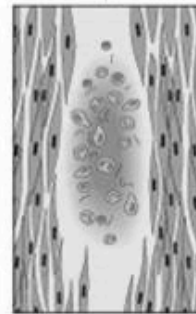
Antibody production



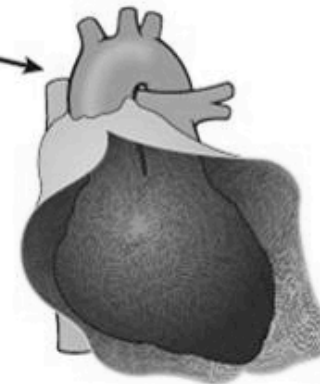
Antibody cross-reaction with heart



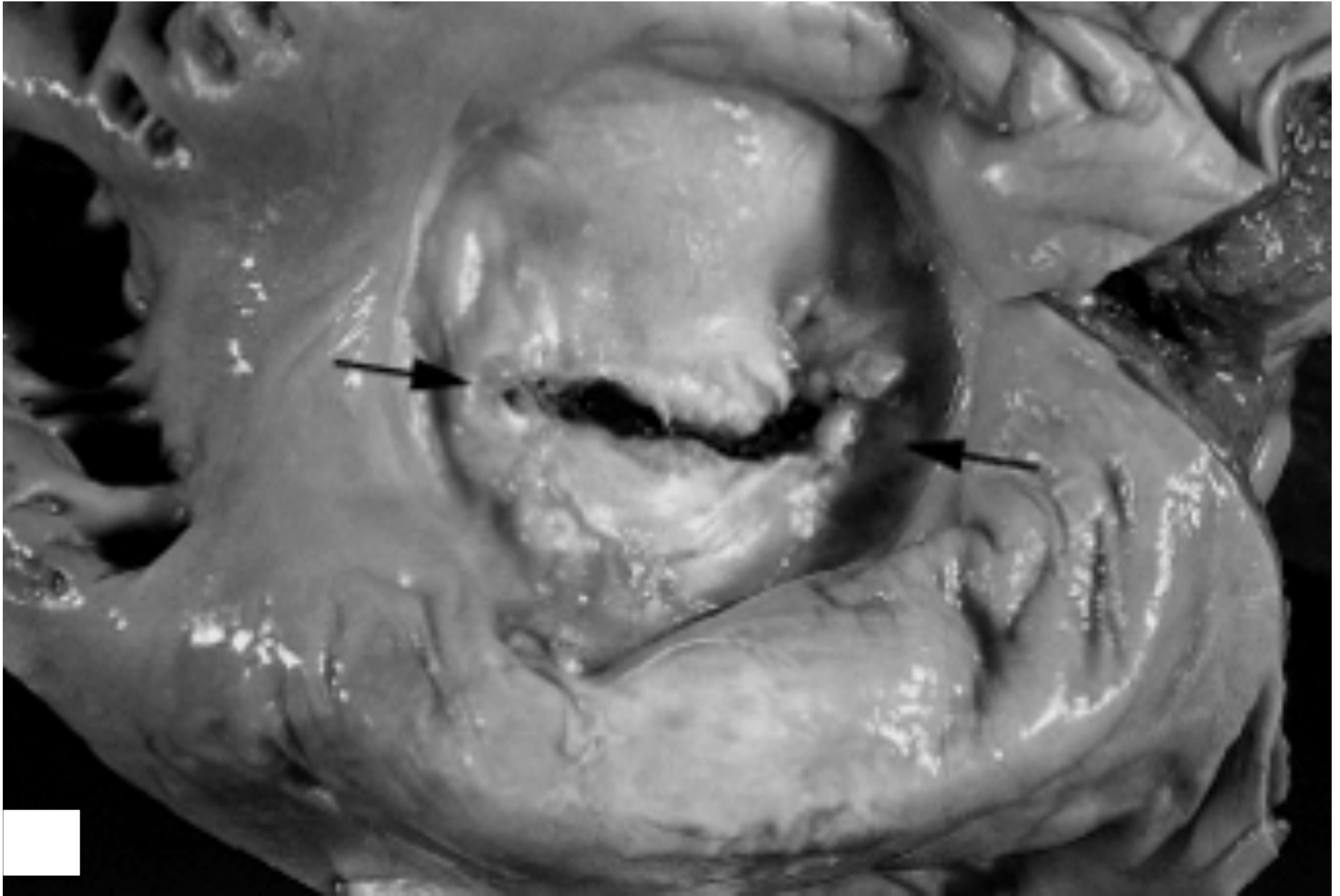
vegetations



Aschoff body



pericarditis

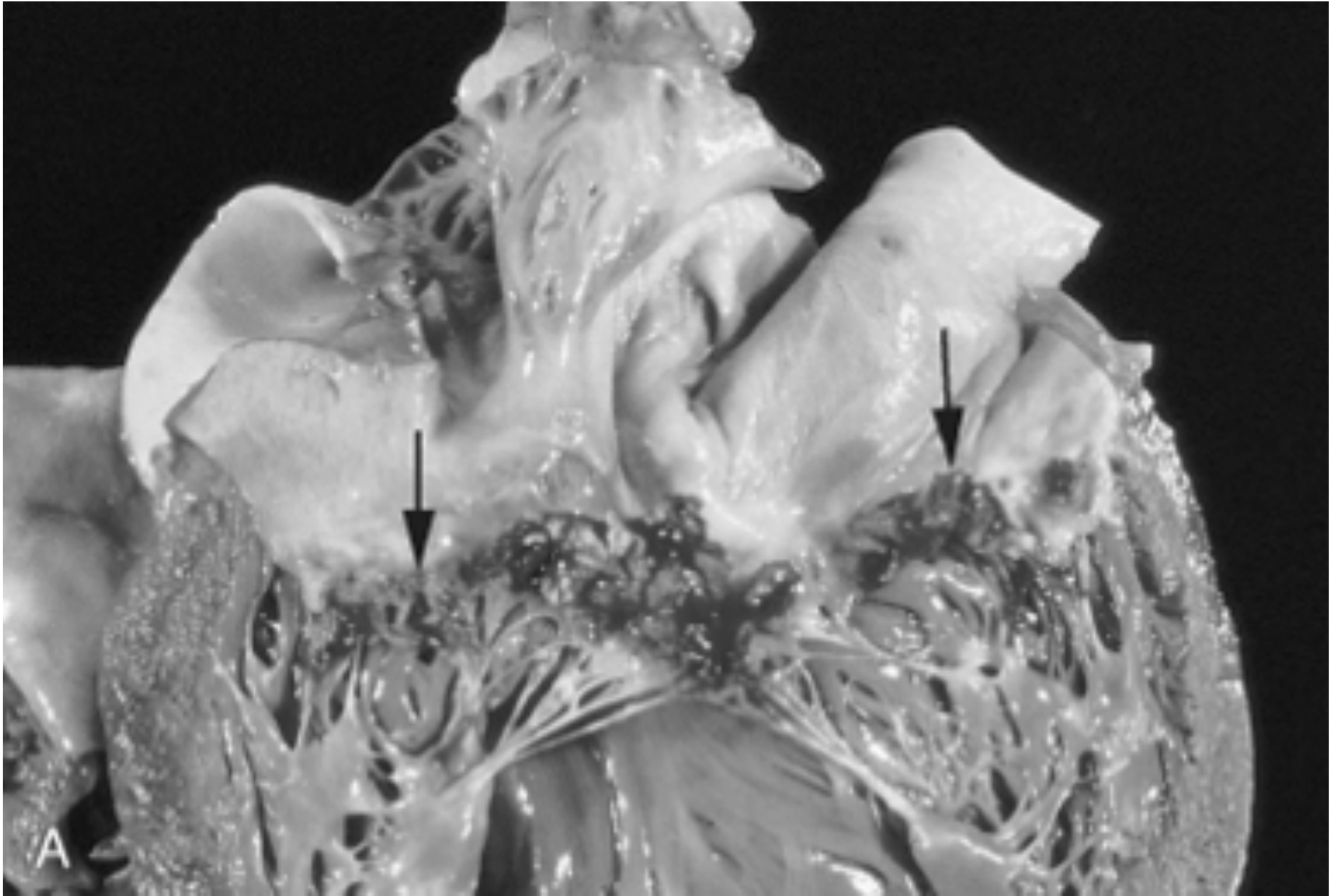


Mitral stenosis with commissural fusion

# Infective Endocarditis

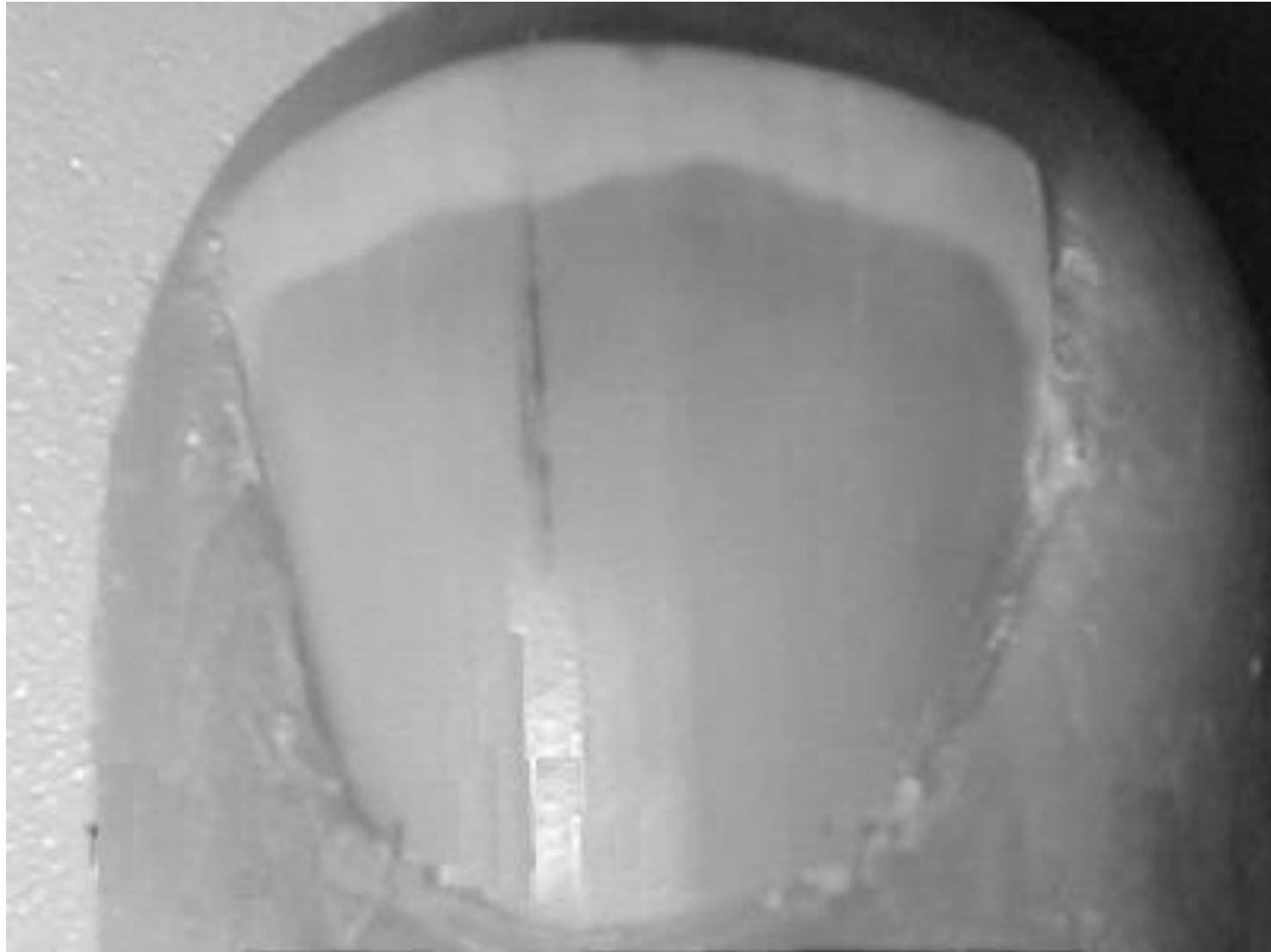
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- Microbial invasion of heart valves, endocardium
- Acute endocarditis
  - highly virulent bug attacks normal valve
  - half of patients dead within days to weeks
- Subacute endocarditis
  - low virulence bug colonizes abnormal valve
  - slow onset, long course, most recover
- Symptoms: fever, flu-like symptoms
- Complications: septicemia, arrhythmias, renal failure, systemic emboli



Infective endocarditis: vegetations on valve





Infective endocarditis: splinter hemorrhage of nail bed

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# Cardiomyopathies

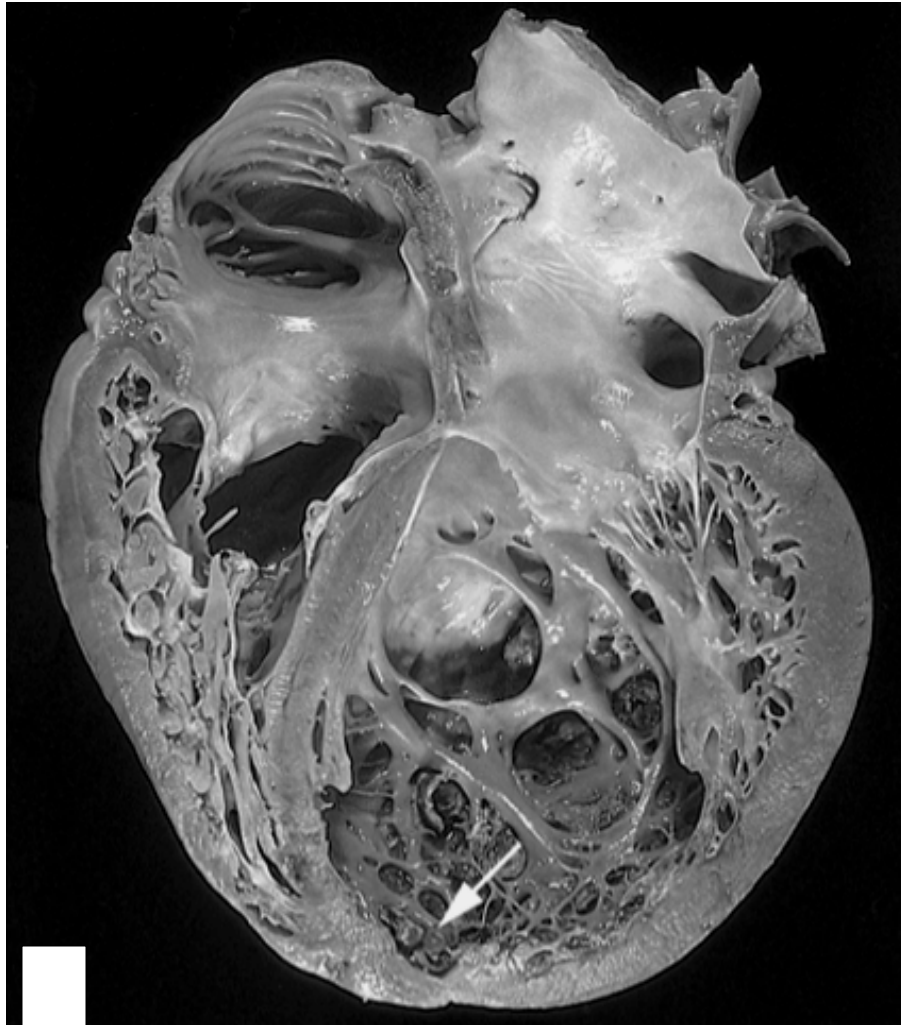
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- Diverse group of disorders in which there is intrinsic myocardial dysfunction
- Lots of causes; some idiopathic
- Three groups
  - dilated cardiomyopathy
  - hypertrophic cardiomyopathy
  - restrictive cardiomyopathy

# Dilated Cardiomyopathy

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- Heart dilates, enlarges, and can't contract well
- Causes
  - viral
  - alcohol/toxin
  - genetic abnormalities
  - peripartum
- Slowly progressing CHF
- 70% of patients dead within 5 years



Dilated (L) and hypertrophic (R) cardiomyopathy

# Hypertrophic Cardiomyopathy

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- Massively hypertrophied L ventricle can't fill
- Cause: mutation in a sarcomere protein gene
- Symptoms: atrial fibrillation, CHF, arrhythmia, sudden death
- Treatment: drugs to promote ventricular relaxation or surgical excision of part of septum
- Prognosis: about 4% of patients die each year



# Restrictive Cardiomyopathy

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- Heart wall is stiff; can't fill during diastole
- Cause: Idiopathic or secondary to systemic disease (amyloidosis, hemochromatosis, sarcoidosis)
- Symptoms: shortness of breath, peripheral edema
- Treatment: not often helpful
- 70% of patients dead within 5 years



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# Cardiac Tumors

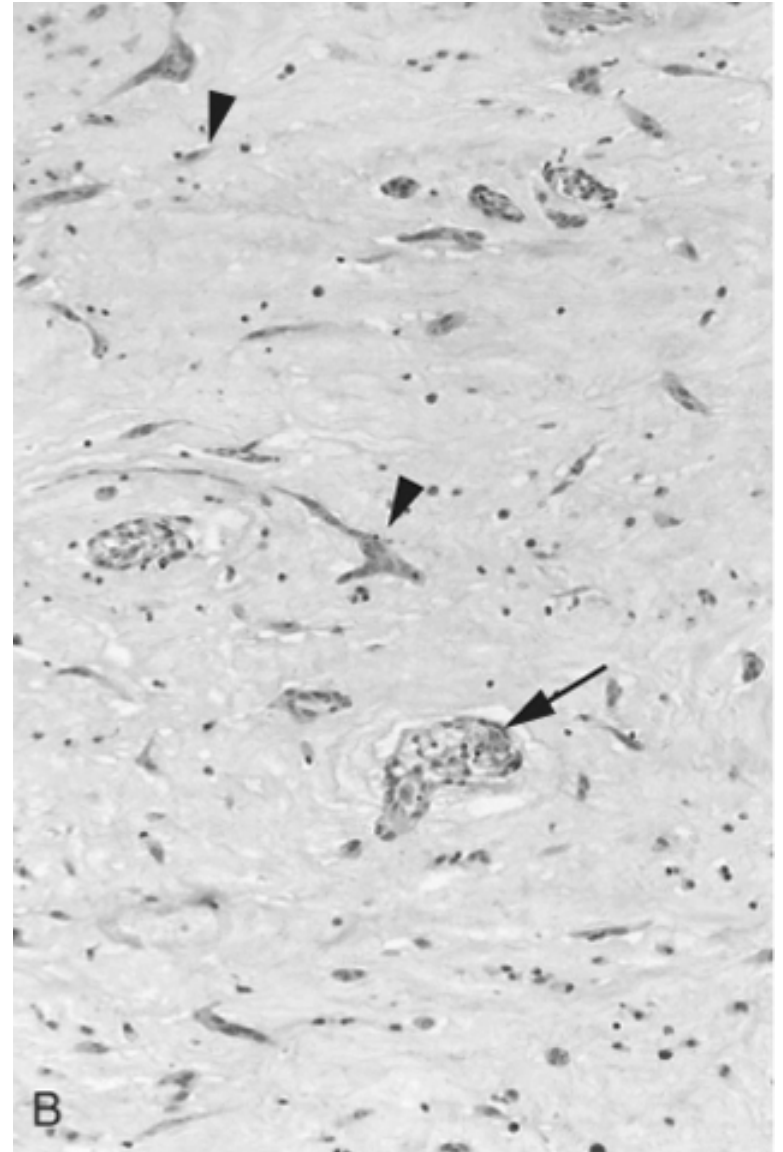
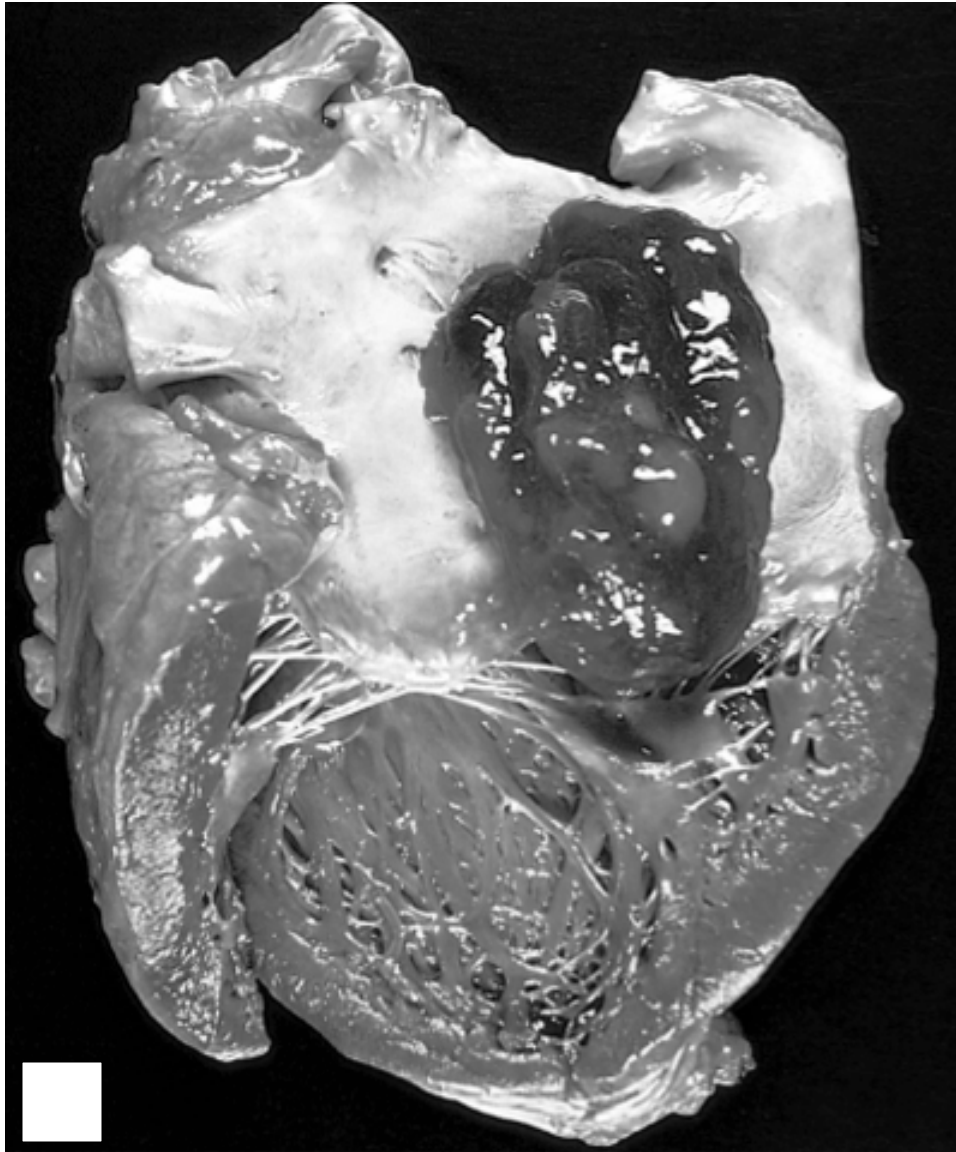
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## Most common: metastatic

- heart is a rare site of metastasis
- lung cancer, lymphoma most common

## Primary tumors uncommon

- most are benign
- most common: myxoma



Cardiac myxoma