

# Hypertension

CVS2

Hisham Al Khalidi

# Hypertension

## Definition

- No rigid definition
  - However, hypertension (HTN) is usually considered when there is :
    - A sustained diastolic pressure greater than 89 mm Hg
- OR**
- A sustained systolic pressure in excess of 139 mm Hg



# Hypertension

## Risk factors \*

- **Hereditary**
- **Race.** African-Americans
- **Gender.** Men & postmenopausal women
- **Age**
- **Obesity**
- **Diet, particularly sodium intake**

Other factors associated with HTN include:

- **Heavy alcohol consumption**
- **Diabetes**
- **Use of oral contraceptives**
- **Sedentary or inactive lifestyle**



# Hypertension

## Types and causes

- *Essential Hypertension (90-95%)*
- *Secondary Hypertension*

# Hypertension

## Types and causes

- ***Secondary Hypertension***

- **Renal:**

- Acute glomerulonephritis
- Chronic renal disease
- Polycystic disease
- Renal artery stenosis
- Renal artery fibromuscular dysplasia
- Renal vasculitis
- Renin-producing tumors

- **Endocrine:**

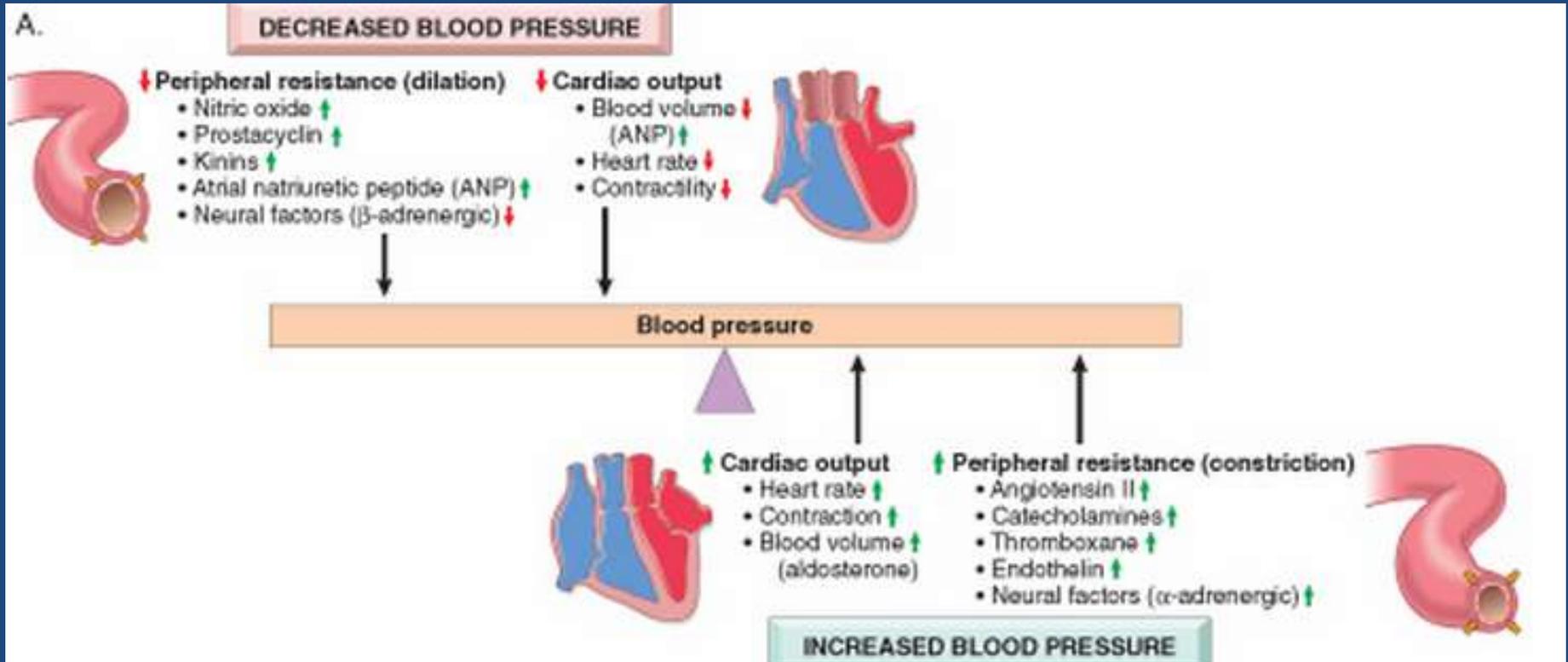
- Adrenocortical hyperfunction (Cushing syndrome, primary aldosteronism, congenital adrenal hyperplasia which is an example of gene defect affecting aldosteron metabloism)
- Exogenous hormones (glucocorticoids, estrogen [including pregnancy-induced and oral contraceptives] and sympathomimetics)
- Pheochromocytoma
- Acromegaly
- Hypothyroidism (myxedema)
- Hyperthyroidism (thyrotoxicosis)
- Pregnancy-induced

# Hypertension

## Types and causes

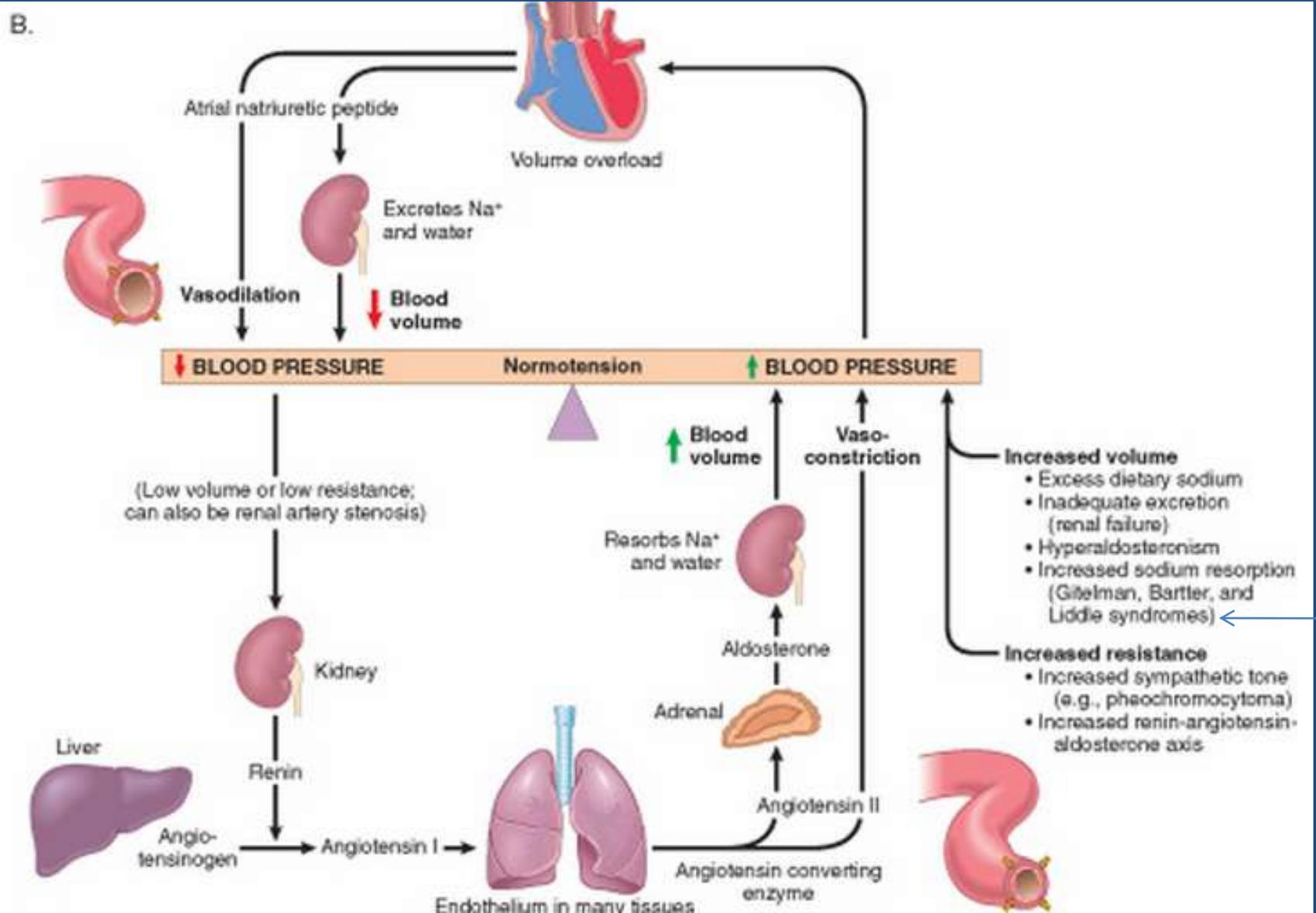
- Cardiovascular:
  - Coarctation of aorta
  - Polyarteritis nodosa (or other vasculitis)
  - Increased intravascular volume
  - Increased cardiac output
  - Rigidity of the aorta
- Neurologic
  - Psychogenic
  - Increased intracranial pressure
  - Sleep apnea
  - Acute stress, including surgery

# Blood pressure regulation



- *Blood pressure is a function of cardiac output and peripheral vascular resistance → two hemodynamic variables that are influenced by multiple genetic, environmental, and demographic factors*

# Renin-angiotensin-aldosterone and atrial natriuretic peptide rule



# Hypertension

Remember!

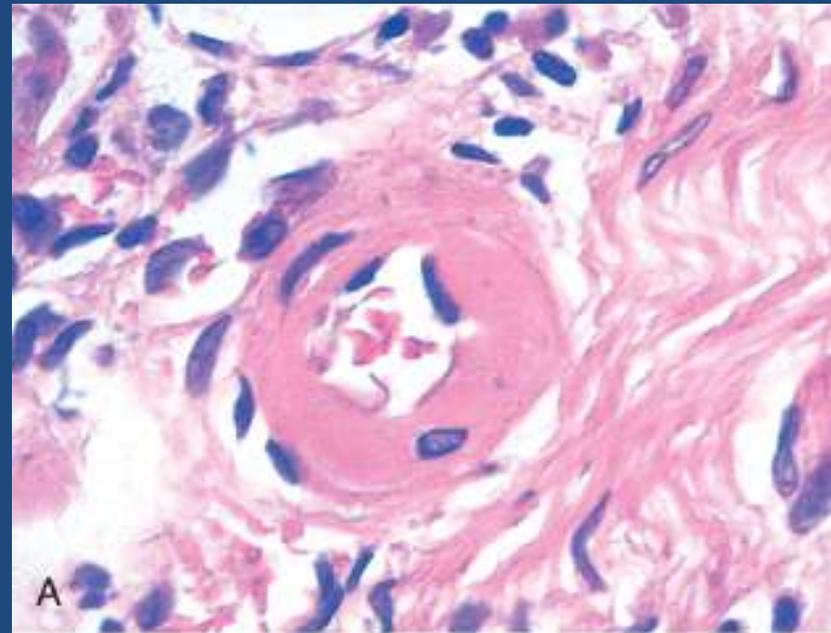
- Peripheral resistance is regulated predominantly at the level of the arterioles
- ***Reduced renal sodium excretion*** in the presence of normal arterial pressure is probably a key initiating event; it is a final common pathway for the pathogenesis of most forms of hypertension

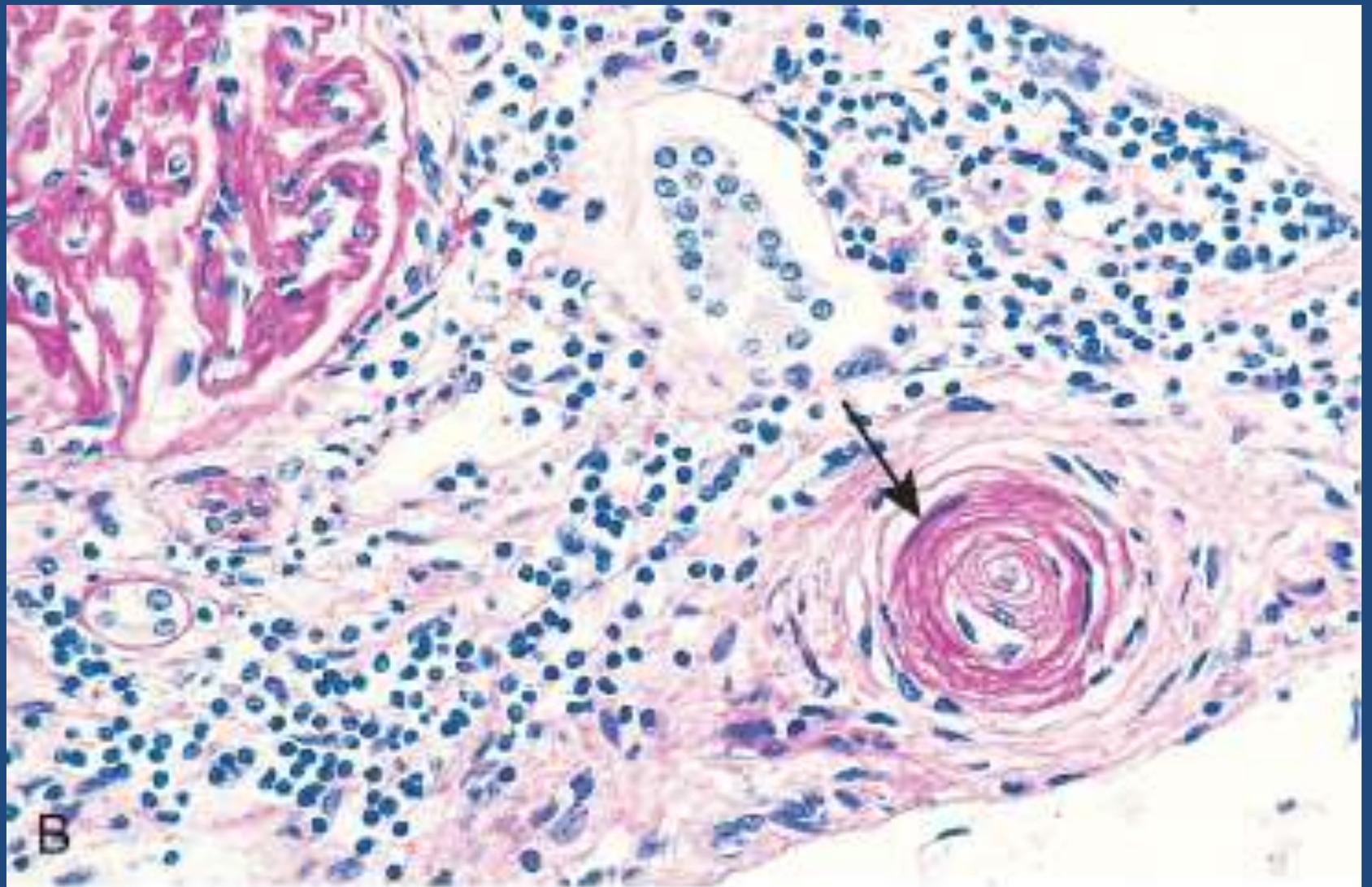


# Hypertension

## Vascular pathology

- Accelerate atherogenesis
- Arteriosclerosis (particularly in the kidney), lead to thick wall and narrow lumen
- It can be either:
  - Hyaline
  - Hyperplastic ( in malignant HTN)





B

© Elsevier 2005

# Malignant hypertension

- A clinical syndrome
- 5% of hypertensive persons
- diastolic pressure over 120mmHg, with:
  - renal failure
  - retinal hemorrhages and exudates, with or without papilledema



# Hypertension

## Major complications \*

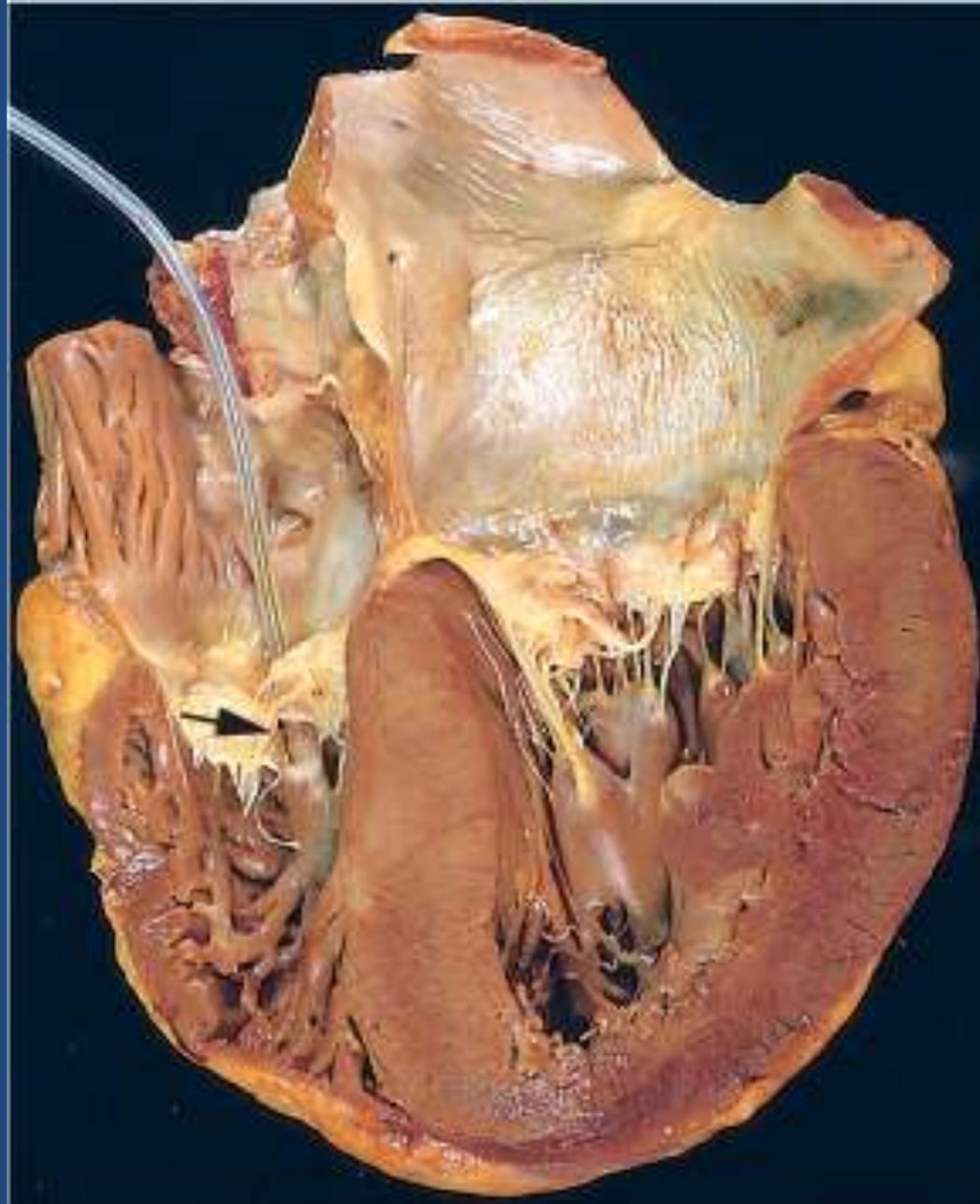
- Coronary heart disease
- Cerebrovascular accidents
- Cardiac hypertrophy and heart failure  
(*hypertensive heart disease*)
- Aortic dissection
- Renal failure
- Retinopathy



# Hypertension

## Systemic hypertensive cardiac disease

- History of hypertension or extracardiac anatomical evidence of HTN
- LVH: concentric with absence of other cause of LVH
- The free LV wall is  $> 2\text{cm}$  and the weight of the heart is  $> 500$  grams
- Long-term: dilatation and wall thinning
- Treatment of HTN helps recovery



© Elsevier 2005

