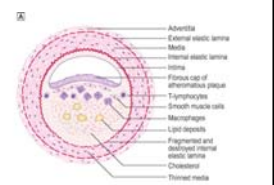
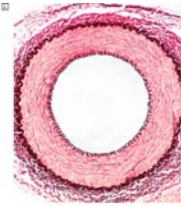


## Diseases of Arteries

## Atherosclerosis (atheroma)

- Abnormal thickening of artery wall with *intimal fibrosis and lipid deposition*



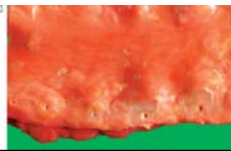
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## Lesions of atherosclerosis

Affects medium and large arteries

- Fatty streak (all population groups)
- Fibrolipid plaque
- Complicated lesions (ulcerated, fissured etc.)

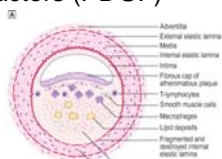


## Causes

- Age
- Hypertension
- Hyperlipidaemia
- Smoking
- Diabetes

## Pathogenesis (complex!)

- Lipid+/-other injury to endothelium
- Macrophage migration into intima (cell adhesion molecule mediated - ICAM 1)
- Immune mechanisms (T cell effects)
- Growth factors (PDGF)



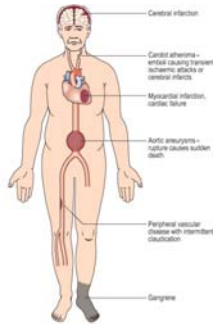
## Effects

- Ischaemia
- Infarction
- Embolism

Worse with complicated lesions.

Ulceration thrombosis leading to plaque growth, occlusion and/or embolism

## Clinical targets .....



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## Aneurysms

- Abnormal localised permanent dilatation of a blood vessel
- Sometimes classified by gross appearance as fusiform or saccular

## Types of aneurysm

- Atherosclerotic (wall weakening in complicated lesion – abdominal aorta)



## Types of aneurysm (2)

- Dissecting (cystic medial necrosis in *proximal* aorta) leads to rupture/haemopericardium
- Seen in hereditary Marfan's syndrome

## Types of aneurysm (3)

- Berry (circle of Willis). Rupture leads to subarachnoid haemorrhage.

## Types of aneurysm (4)

- Charcot aneurysm. Seen in branches of middle cerebral artery in hypertension (cause of cerebral haemorrhage)

### Cause of aneurysm (5)

- Syphilis. Proximal aorta. Leads to aortic valve incompetence. An inflammatory lesion (organisms present)
- Mycotic. Infective emboli (endocarditis). Most often seen in brain

### Hypertension

- Definition arbitrary (pressure is a continuum)
- Diastolic
  - Mild (>95mmHg)
  - Moderate (105-114 mmHg)
  - Severe (>115 mmHg)
- Systolic?  
*Criteria may be modified by coexisting illness (e.g. diabetes)*

### Essential (1<sup>0</sup>) hypertension

- Accounts for most cases (90%)
- Physiological basis unsure (problem with salt metabolism/renin-angiotensin system?)
- Familial (West Africans and African-Americans)
- Associated with obesity

### Secondary hypertension

- Congenital – coarctation of the aorta
- Renal
  - Renal artery stenosis (congenital or atherosclerosis)
  - Chronic renal failure (renin activity – salt and water retention)

### Secondary hypertension (2)

- Endocrine
  - Adrenocortical hyperplasia or adenoma (either increase in cortisol or aldosterone)
  - Adrenal medullary neoplasia (phaeochromocytoma)
  - Pituitary neoplasm (particularly ACTH – producing – Cushing's disease)
  - Hyperthyroidism
- Steroid therapy

### Effects of hypertension

- Increased vascular resistance leads to *left ventricular hypertrophy*
- Atherosclerosis
- Renal vascular damage (intimal proliferation and hyaline sclerosis of small arteries and arterioles – also visualised in retina)
- Cerebral haemorrhage

## Malignant hypertension

- Diastolic BP >150 mmHg and rising
- African males (30s)
  - Acute cardiac failure
  - Papilloedema and retinal haemorrhages
  - Cerebral haemorrhage
  - Fibrinoid necrosis of renal small arteries and glomeruli

## Vascular disease in diabetics

- Premature atherosclerosis (even females)
  - Microangiopathy (small vessel disease)
    - Basement membrane thickening ↑ ( permeability)
    - Hyaline arteriosclerosis
- Partly caused by glycosylation of proteins in vessel wall. Causes *retinal microaneurysms, glomerulosclerosis, peripheral neuropathy*

## Vasculitis

- Inflammatory disease of blood vessels (manifest especially in skin, kidney, GI tract)
- Deposition of *antigen-antibody complexes* with complement fixation, endothelial injury, thrombosis (occlusion/ischaemia)

## Vasculitis disease syndromes

- Polyarteritis nodosa (PAN) sometimes hepatitis B related
- Wegener's granulomatosis (resp. tract and kidney)- anti neutrophil cytoplasmic antibodies (ANCA)
- Systemic lupus erythematosus (skin, kidney) – anti DNA antibodies

## Vascular neoplasia

- Benign lesions (often congenital) are common). Head and neck cutaneous vascular malformations can be associated with similar more dangerous intracranial lesions (Sturge – Weber syndrome)
- Names used include capillary angioma, arterio-venous (AV) malformation (a source of cerebral haemorrhage)

## Malignant vascular neoplasms

- Angiosarcoma either of deep soft tissues or of scalp skin (older pale-skinned people)
- Kaposi's sarcoma

## Kaposi's sarcoma



- 1872 – described in East European men (especially Ashkenazi Jews)
- This is known as *Classic KS*

## Classification of KS

- Classic (rare in females)
- Endemic (African). Aggressive disease with lymphadenopathy, often in children.
- Transplant (or immunosuppression) associated – internal organ disease
- Epidemic (HIV associated)

## Pathogenesis of KS

- All forms associated with infection by *human herpesvirus 8 (HHV-8)* also known as *KS-associated herpesvirus (KSHV)*
- Related to Epstein-Barr virus
- Immunosuppression often a cofactor

## KS in HIV

- Rise in epidemic HIV – associated cases makes KS the commonest malignant neoplasm in Central Africa
- Disease almost 200 times more common in AIDS patients (compared to normal)
- Male: female ratio closer to 2:1 (differs from US where male homosexuals are the biggest group)

## KS in HIV (2)

- Skin is the main site of disease but visceral KS (often clinically silent) is present in 75%
  - Lung, lymph nodes, GI tract

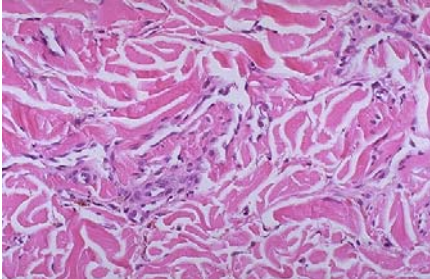


## Histopathology of KS

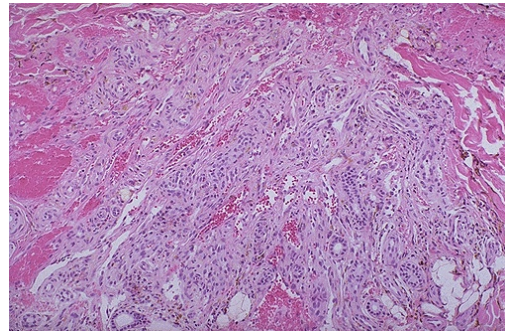
- The neoplastic cell is the endothelial cell
- Can be subtle and confused with benign lesions – especially in early stages
- Iron (haemosiderin) pigment accumulates

## KS skin (patch stage)

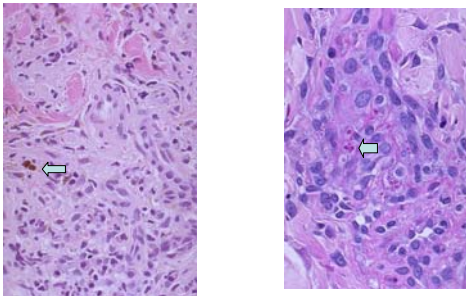
- Subtle!



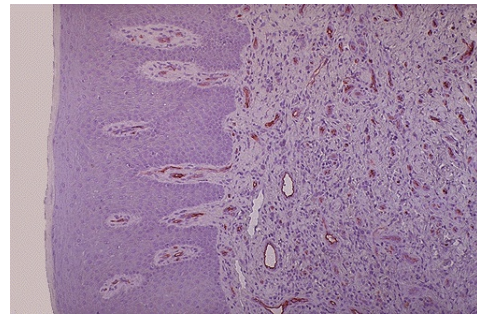
## Skin nodule



## Haemosiderin and cytoplasmic globules



## Immunohistochemical demonstration of CD 34 (endothelial marker)



## Staging of KS

- Stage I: locally indolent KS
- Stage II: locally aggressive KS +/- lymphadenopathy
- Stage III: generalised mucocutaneous +/- lymph node disease
- Stage IV: visceral disease

Modified by absence (A) or presence (B) of systemic symptoms and by CD4 count