PVD

A short review

MAIN TOPICS

- What is PVD?
- Pathophysiology
- Risk Factors
- Prevalence
- Mortality
- Diagnosis
- Treatment
- Complications
- Follow-up

PVD is a.k.a

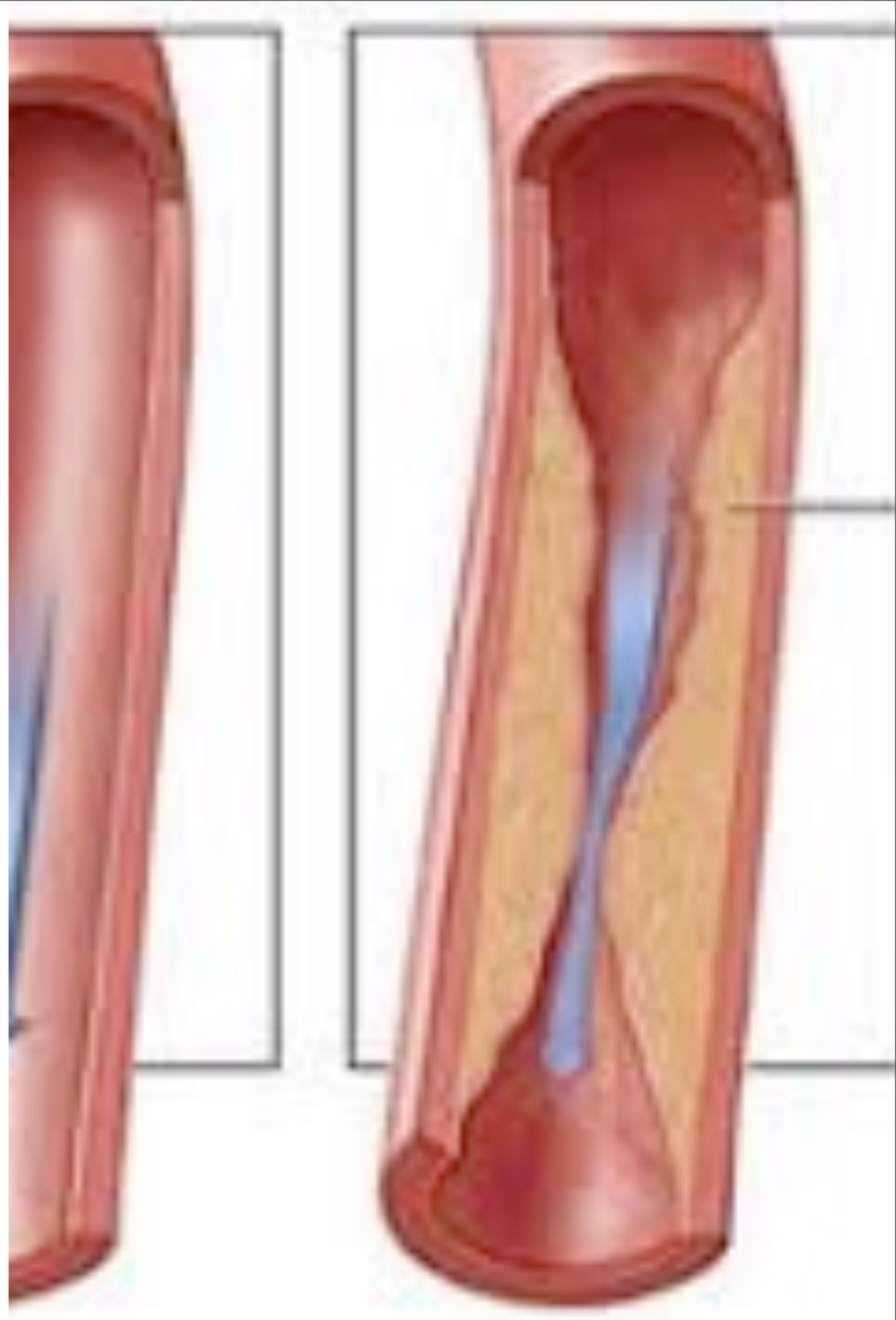
- Atherosclerosis
- Blocked arteries
- Hardening of the arteries
- Stiffening of the arteries
- Plaque build-up
- PAD
- PVD

Peripheral arterial disease

- defined as occlusive disorder of the arterial system which may affect:
  - Arms
  - Legs
  - Mesenteric arteries (which supply the intestines and kidneys)
  - Carotid and vertebral arteries

PATHOLOGY

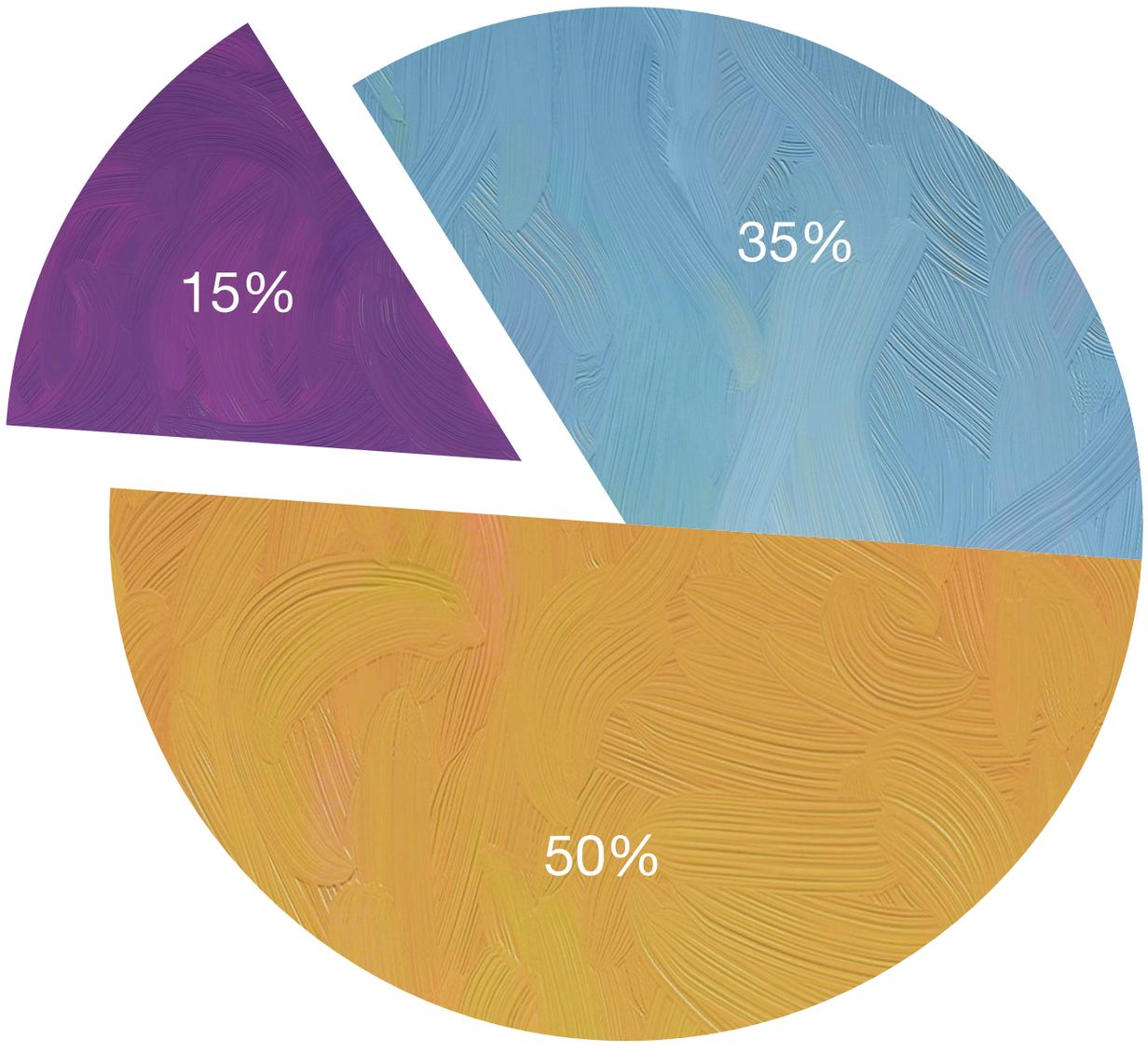
- similar to heart
- extra-cholesterol and fat circulating in the blood collects in the wall of the arteries that supply blood to the limbs
- Result: narrowing of the arteries



PREVALENCE OF PAD

- About 1 in 5 people > 60 yo in the UK have some degree of PAD
- AGE: >70 yo ~ 30%
- 1 in 3 patients with Diabetes Mellitus > 50 yo

PAD remains highly undiagnosed



- Up to 50% of PAD is asymptomatic and untreated
- Around 35% is symptomatic and untreated
- Only around 15% of PAD is symptomatic, diagnosed and treated!!!

RISK FACTORS

- SMOKING
- DM
- HTN
- HIGH CHOLESTEROL
- OBESITY
- SEDENTARY LIFESTYLE

FRAMINGHAM HEART STUDY

Disease evolution of PAD

- Claudication
- Rest pain*
- Ulceration*
- Gangrene*
- Limb loss*

*Critical limb ischemia

INTERMITTENT CLAUDICATION

- from Lat. = to limp
- Reproducible discomfort of a group of muscles that is induced by exercise and relieved with rest
- supply do not meet demand
- Location depends upon the location of the disease
  - buttocks, thigh, calf or foot claudication, either singly or in combination

MORE SIGNS AND SYMPTOMS

- Cramping or pain in the feet at rest that often disturbs sleep
- Sores or wounds on toes, feet or legs that heal slowly, poorly or not at all
- Color changes in the skin of the feet
- Lower temperature in one leg compared to the other
- Poor nail growth and hair growth on toes and legs

MORTALITY AND PAD

- PAD is a systemic disease and a marker for disease of arteries in the heart and in the brain
- Life expectancy reduced 10 years in patients with PAD
- Mortality rate:
    - 25% at 5 years
    - 50% at 10 years
    - 75% at 15 years
- Majority of death caused by CV events.

DIAGNOSIS OF PAD

- History
- Physical exam
- Non-invasive studies: ultrasound
- Radiologic: Angiography, CTA, MRA

HISTORY

- Risk factors
- Exercise induced sxs (Intermittent claudication)
    - Exertional calf or buttock pain
    - Causes the patient to stop walking
    - Resolves in 5-10 min
- Rest pain
    - forefoot pain primarily occurs at night
    - alleviated when foot is placed in a dependent position
- Ulceration
    - Distant foot/toes
    - Heel

EDINBURGH QUESTIONNAIRE

- Do you get a pain/discomfort in your leg(s) when you walk? YES
- Does this pain ever begin when you are standing still or sitting? NO
- Do you get it when you walk uphill/hurry? YES
- Do you get it when you walk at an ordinary pace on level ground? YES
- What happens if you stand still? DISAPPEARS IN 10 MIN OR LESS
- Where do you get this pain? CALF and/ THIGH and/ BUTTOCKS

OTHER CAUSES OF LEG PAIN

- Vascular
    - Venous disease
    - PAD
- Neurospinal
    - Disc disorders (cervical or lumbar)
    - Spinal stenosis (pseudo-claudication)
- Neuropathic
    - Diabetes
    - Chronic ET-OL abuse
- Musculo-skeletal
    - Arthritis (variation with weather+time of the day)
    - Chronic compartment syndrome

Differential Diagnosis of Int. Claudication

Quality of PAIN	“Cramping”	“Bursting” “Throbbing”	“Electric shock-like” “Shooting”
ONSET	gradual, consistent	gradual or immediate	immediate or inconsistent
RELIEVED BY	standing still	elevation of the leg	sitting down, bending forward
LOCATION	Muscles groups: buttocks, thigh, calf	entire leg	poorly located or entire leg
LEGS AFFECTED	usually one	usually one	often both
	ARTERIAL	VENOUS	NEUROGENIC

Location, location, location!

- Buttocks, hip
    - usually indicates aorto-iliac (pelvic) disease = LERICHE syndrome which is bilateral disease + erectile dysfunction
- Thigh
    - Blockage of the common femoral artery
    - Leads to sxs in thigh, calf or both
- Calf
    - Due to the blockage of the superficial femoral or popliteal artery

PHYSICAL EXAM

- Exam performed with pants, socks and shoes off.
- Limb examination for PAD
    - absent / diminished femoral or pedal pulses
    - arterial bruits
    - hair loss
    - poor nail growth
    - dry, scaly, atrophic skin
    - dependent rubor
    - pallor when leg elevation after 1 min
    - ischemic tissue ulceration
    - gangrene

ANKLE-BRACHIAL INDEX (ABI)

- ABI= Ankle systolic pressure/ brachial systolic pressure
- Normal :1
- PAD < 0.9
- 0.8-0.9 MILD
- 0.5-0.79 MODERATE
- < 0.5 SEVERE
- < 0.4 LIMB ISCHEMIA

ABI using DOPPLER

- first step to diagnose PAD in high risk patients or symptomatic patients

Angiography

- most accurate diagnostic test in PAD
- it is not done to diagnose PAD but to identify the site of the lesion in order to guide therapy such as angioplasty, stenting or bypass

MANAGEMENT

- Lifestyle modification
    - Smoking cessation
    - Regular exercise
    - Diet
- Medication
    - Antiplatelet therapy
    - Statins
    - Cilostazol
    - Control risk factors (HTN, blood glucose)

Lifestyle Modifications

- Exercise
    - 3-5 sessions a week
    - 35-50 min
    - Type: exercise-rest-exercise-rest...
    - Length: 3-6 months
    - Result: 100-150% improvement
    - allow to develop collateral circulation in leg

Medication

- Antiplatelet
    - Aspirin 75 mg
    - Clopidogrel 75 mg
- Statins
    - Atorvastatin 40-80 mg/ day
    - Rosuvastatin 20-40 mg/day
    - Side effects < 5% : headache, nausea, sleep disturbances, liver dysfunction, muscle pain, myositis, and rhabdomyolysis
    - Interaction with warfarin, digoxin
- Cilostazol 100 mg twice a day
    - improves sxs, allows patient to walk and exercise more
    - CI in CHF

Vascular Surgery

- Evaluate and treat aspects of blood vessel disease throughout the body
- Use both surgical and non-surgical techniques
- Exception: the HEART - treated by cardiologists and cardio-thoracic surgeons

Endovascular Surgery

- Minimally invasive techniques to treat blockages in arteries and veins
- Similar to heart catheterization
- Most often performed with local anaesthesia +/-sedation (no breathing tube)
- Refers to balloons and stents
- Most often performed as outpatient procedures

Surgical Interventions for PVD

- Endarterectomy
- Bypass surgery
- Amputation

Blockages come back

- Early failures
    - < 30 days
    - technical issues
- Mid-term failures
    - 30 days- 2 years
    - Intimal hyperplasia (scarring of the blood vessel)
- Long-term failures
    - > 2 years
    - Progressive disease

Follow-up care

- Continued joint care by surgeon and primary care physician
- Reinforce risk factor modification
- Assess status at regular intervals post procedure
    - Noninvasive testing (ultrasound)