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Peripheral Vascular Examination and Ankle Brachial Index

Practical 07 / Supervised clinical examination

Aim

Examine limb perfusion and interpret a measured ankle–brachial index.

Principle

Pulse, temperature, skin and symptoms guide assessment of arterial or venous disease. Ankle systolic pressure relative to arm pressure provides a non-invasive arterial measure.

Materials and Requirements

- Supervised volunteer or simulation case, Doppler trainer and correctly sized cuffs
- Limb vascular map and pressure worksheet

Procedure

1. Ask about exertional pain, rest pain, wounds, swelling and vascular risks. Inspect symmetry, colour, skin and ulcers.
2. Clarify onset, walking distance at symptom onset, rest symptoms, wounds and vascular history. Inspect both limbs and map changes by side and site.
3. Compare warmth and palpate the major pulses bilaterally. Record pulses by anatomical site and examine relevant sensory and motor functions.
4. Compare femoral or accessible distal pulses as appropriate, recording landmarks and relative strength. Note temperature, colour and sensation or movement changes and escalate a threatened limb promptly.

Continue with step 5 on the next page.

Procedure Continued

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5. On the teaching setup measure both brachial pressures at rest and dorsalis pedis and posterior tibial systolic pressures for each ankle.
6. After resting supine for the training measurement, use correctly sized cuffs and the Doppler setup as taught. Label both brachial and both ankle artery readings for each side.
7. Divide the higher ankle pressure for each leg by the higher brachial pressure. Record the raw measurements and note non-compressibility or other limitations.
8. Choose the higher arm pressure for the denominator and the higher of the two valid ankle pressures for that leg. Compute each side separately and record technical limitations.
9. Summarise evidence of impaired perfusion and report acute changes urgently.
10. Relate the ratios to symptoms and pulses and identify non-compressible or discordant readings for review. Give an urgent handover for a new perfusion or sensory deficit.

Precautions

- A sudden cold painful limb, loss of pulse or new sensorimotor change requires immediate assessment.
- Record factors that may make vessels non-compressible.

Observations and Interpretation

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Observations and Record

Item	What to record	What it tells you
Symptoms	Exertional and rest symptoms, onset and wound history	Suggests acuity and functional impact
Pulses and skin	Sites, sides, temperature and ulcer findings	Localises possible impairment
Index	Ankle and arm pressures with calculated ratio	Quantifies the pressure difference

Worked Example

The higher arm pressure is 140 mmHg. The larger right ankle pressure is 98 mmHg. The right ankle–brachial index is 0.70 in a case with exertional calf pain.

Result and Interpretation

This is an abnormal low result in the teaching case and supports peripheral arterial disease. Correlate with the full clinical findings.

Viva Questions and Answers

Why use both arms?

The higher valid brachial pressure is the standard denominator.

What is a limitation in some patients with diabetes?

Arterial calcification can make ankle pressures falsely high.

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