EXAMINATION OF A VASCULAR PATIENT

Mr. Zainal Ariffin Azizi
Consultant General/Vascular Surgeon
Department of General Surgery
Hospital Kuala Lumpur
Vascular Examination

- History.
- Physical Examination.
- Non-Invasive Bedside Assessment.
  - Ward.
  - Vascular Laboratory.
History

- Painful Limb
- Swollen Limb
- Chronic Leg Ulcers +/- Tissue loss
- Abdominal/Chest Pain +/- mass
- Cerebral / Ocular Symptoms
- Incidental
Vascular Examination

- History
  - Painful Limb
    - Acute / Chronic
    - Type / Pattern
      - Intermittent claudication
      - Rest Pain (critical limb ischaemia)
    - Associated Symptoms
    - Associated medical/risk factors
    - Assessment of disability / risk
Vascular Examination
# Vascular Examination

## Table 3: Differential Diagnosis of Intermittent Claudication

<table>
<thead>
<tr>
<th>Condition</th>
<th>Location of Pain or Discomfort</th>
<th>Characteristic Discomfort</th>
<th>Onset Relative to Exercise</th>
<th>Effect of Rest</th>
<th>Effect of Body Position</th>
<th>Other Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent claudication</td>
<td>Buttock, thigh, or calf muscles and rarely the foot</td>
<td>Cramping, aching, fatigue, weakness, or frank pain</td>
<td>After same degree of exercise</td>
<td>Quickly relieved</td>
<td>None</td>
<td>Reproducible</td>
</tr>
<tr>
<td>Nerve root compression (e.g., herniated disc)</td>
<td>Radiates down leg, usually posteriorly</td>
<td>Sharp lancinating pain</td>
<td>Soon, if not immediately after onset</td>
<td>Not quickly relieved (also often present at rest)</td>
<td>Relief may be aided by adjusting back position</td>
<td>History of back problems</td>
</tr>
<tr>
<td>Spinal stenosis</td>
<td>Hip, thigh, buttocks (follows dermatome)</td>
<td>Motor weakness more prominent than pain</td>
<td>After walking or standing for variable lengths of time</td>
<td>Relieved by stopping only if position changed</td>
<td>Relief by lumbar spine flexion (sitting or stooping forward)</td>
<td>Frequent history of back problems, provoked by intra-abdominal pressure</td>
</tr>
<tr>
<td>Arthritic, inflammatory processes</td>
<td>Foot, arch</td>
<td>Aching pain</td>
<td>After variable degree of exercise</td>
<td>Not quickly relieved (and may be present at rest)</td>
<td>May be relieved by not bearing weight</td>
<td>Variable, may relate to activity level</td>
</tr>
<tr>
<td>Hip arthritis</td>
<td>Hip, thigh, buttocks</td>
<td>Aching discomfort, usually localized to hip and gluteal region</td>
<td>After variable degree of exercise</td>
<td>Not quickly relieved (and may be present at rest)</td>
<td>More comfortable sitting, weight taken off legs</td>
<td>Variable, may relate to activity level, weather changes</td>
</tr>
<tr>
<td>Symptomatic Baker's cyst</td>
<td>Behind knee, down calf</td>
<td>Swelling, soreness, tenderness</td>
<td>With exercise</td>
<td>Present at rest</td>
<td>None</td>
<td>Not intermittent</td>
</tr>
<tr>
<td>Venous claudication</td>
<td>Entire leg, but usually worse in thigh and groin</td>
<td>Tight, bursting pain</td>
<td>After walking</td>
<td>Subsides slowly</td>
<td>Relief speeded by elevation</td>
<td>History of iliofemoral deep vein thrombosis, signs of venous congestion, edema</td>
</tr>
<tr>
<td>Chronic compartment syndrome</td>
<td>Calf muscles</td>
<td>Tight, bursting pain</td>
<td>After much exercise (e.g., jogging)</td>
<td>Subsides very slowly</td>
<td>Relief speeded by elevation</td>
<td>Typically occurs in heavy muscled athletes</td>
</tr>
</tbody>
</table>

Adapted from J Vasc Surg, 31, Dormandy JA, Rutherford RB, for the TransAtlantic Inter-Society Consensus (TASC) Working Group, Management of peripheral arterial disease (PAD), S1–S96, Copyright 2000, with permission from Elsevier (16).
Vascular Examination

- **History**
  - **Swollen Limb**
    - Usually venous / lymphatic / AVM
    - Acute / Chronic
    - Pattern : Unilateral / Bilateral
    - Associated symptoms and signs
# Vascular Examination

## Table 1-1. Differential Diagnosis of Chronic Leg Swelling

<table>
<thead>
<tr>
<th>Clinical Feature</th>
<th>Venous</th>
<th>Lymphatic</th>
<th>Cardiac Orthostatic</th>
<th>“Lipedema”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistency of swelling</td>
<td>Brawny</td>
<td>Spongy</td>
<td>Pitting</td>
<td>Noncompressible (fat)</td>
</tr>
<tr>
<td>Relief by elevation</td>
<td>Complete</td>
<td>Mild</td>
<td>Complete</td>
<td>Minimal</td>
</tr>
<tr>
<td>Distribution of swelling</td>
<td>Maximal in ankles and legs,</td>
<td>Diffuse, greatest distally</td>
<td>Diffuse, greatest distally</td>
<td>Maximal in ankles and legs, feet spared</td>
</tr>
<tr>
<td></td>
<td>feet spared</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associated skin changes</td>
<td>Atrophic and pigmented,</td>
<td>Hypertrophied, lichenified</td>
<td>Shiny, mild</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>subcutaneous fibrosis</td>
<td>skin</td>
<td>pigmentation, no</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>trophic changes</td>
<td></td>
</tr>
<tr>
<td>Pain</td>
<td>Heavy ache, tight or bursting</td>
<td>None or heavy ache</td>
<td>Little or none</td>
<td>Dull ache, cutaneous</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sensitivity</td>
</tr>
<tr>
<td>Bilaterality</td>
<td>Occasionally, but usually unequal</td>
<td>Occasionally, but usually unequal</td>
<td>Always, but may be unequal</td>
<td>Always</td>
</tr>
</tbody>
</table>
Vascular Examination

- History
  - Chronic Leg Ulcers
    - Arterial, Venous, Neuropathic or combination
    - Element of infection
    - Classic Characteristics esp. SITE
    - Associated risk factors and past history – useful
    - Previous treatment. Recurrence
    - Disability and socioeconomic status
# Vascular Examination

<table>
<thead>
<tr>
<th>Type</th>
<th>Usual Location</th>
<th>Pain</th>
<th>Bleeding With Manipulation</th>
<th>Lesion Characteristics</th>
<th>Associated Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ischemic</td>
<td>Distally, on dorsum of foot or toes</td>
<td>Severe, particularly at night, relieved by dependency</td>
<td>Little or none</td>
<td>Irregular edge, poor granulation tissue</td>
<td>Trophic changes of chronic ischemia, absent pulses</td>
</tr>
<tr>
<td>Stasis</td>
<td>Lower third of leg (gaiter area)</td>
<td>Mild, relieved by elevation</td>
<td>Venous oozing</td>
<td>Shallow, irregular shape, granulating base, rounded edges</td>
<td>Stasis dermatitis</td>
</tr>
<tr>
<td>Neurotrophic</td>
<td>Under calluses or pressure points (e.g., plantar aspect of first or fifth metatarsophalangeal joint)</td>
<td>None</td>
<td>May be brisk</td>
<td>Punched-out, with deep sinus</td>
<td>Demonstrable neuropathy</td>
</tr>
</tbody>
</table>
Vascular Examination
Vascular Examination

- **History**
  - **Pulsatile masses**
    - Extremities / Abdominal
    - True or pseudoaneurysms
    - Are they symptomatic? Rapid expansion
    - Emergency/Urgent due to potential rupture.
    - Hemorrhagic shock
    - AAA commonly in older age group with associated medical risk factors.
Vascular Examination

**FIGURE 2-1.** The risk/benefit analysis that underlies the decision to operate requires accurate assessment of the risks of mortality and morbidity for a given operation, the frequency and consequences of technical and hemodynamic failure (longevity, patency rate), and the likelihood of serious events or sequelae associated with the (medically treated) natural history of the condition.
Vascular Examination

- Physical Examination
  - Inspection
    - Skin colour changes
    - Ulcer description
    - Look for ischemic changes.
      - Acute vs Chronic
    - Dilated veins
      - Varicose veins
      - Sign of DVT or Venous obstruction
Vascular Examination
Vascular Examination

- Physical Examination
  - Palpation
    - PULSES
      - Radial, brachial, femoral, popliteal, post tibial & dorsalis pedis
      - Grade and document (diagram) - , +, ++
      - Compare both limbs.
Physical Examination

- Peripheral pulses
  - Normal
  - Weak
  - Absent

- State of the vessel
  - Calcified
  - Aneurysmal
Vascular Examination
Vascular Examination

- Physical Examination
  - Auscultation
    - Carotid Bruit
    - Abdominal Bruit
    - AVF
Vascular Examination

- Varicose Veins
  - Primary or secondary
  - Patency of deep veins
  - Clinically elicit *sites of incompetence*
    - Sapheno-femoral junction
    - Sapheno-popliteal junction
    - Perforators
  - Presence of complications:
    - Chronic Venous Insufficiency (CVI)
    - CEAP classification
Vascular Examination
Vascular Examination

- Bed side Examination
  - Continuous Wave Doppler Assessment (Hand held Doppler): 8MHz.
  - ABSI
Vascular Examination
Vascular Examination
Vascular Examination
Vascular Examination
Vascular Examination
Vascular Examination
<table>
<thead>
<tr>
<th>ABSI</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1.1</td>
<td>Normal but usually incompressible vessels</td>
</tr>
<tr>
<td>0.9-1.1</td>
<td>Normal</td>
</tr>
<tr>
<td>0.7-0.89</td>
<td>Mild to moderate disease (asymptomatic to mild)</td>
</tr>
<tr>
<td>&lt;0.7</td>
<td>Moderate-severe disease</td>
</tr>
<tr>
<td>&lt;0.3</td>
<td>Critical Limb Ischaemia</td>
</tr>
</tbody>
</table>
**Vascular Examination**

---

**Table 11. Clinical Categories of Acute Limb Ischemia**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description/Prognosis</th>
<th>Sensory Loss</th>
<th>Muscle Weakness</th>
<th>Arterial Doppler Signals</th>
<th>Venous Doppler Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viable</td>
<td>Not immediately threatened</td>
<td>None</td>
<td>None</td>
<td>Audible</td>
<td>Audible</td>
</tr>
<tr>
<td>Threatened marginally</td>
<td>Salvageable if promptly treated</td>
<td>Minimal (toes) or none</td>
<td>None</td>
<td>(Often) inaudible</td>
<td>Audible</td>
</tr>
<tr>
<td>Threatened immediately</td>
<td>Salvageable with immediate revascularization</td>
<td>More than toes; associated with rest pain</td>
<td>Mild, moderate</td>
<td>(Usually) inaudible</td>
<td>Audible</td>
</tr>
<tr>
<td>Irreversible</td>
<td>Major tissue loss or permanent nerve damage</td>
<td>Profound, anesthetic</td>
<td>Profound paralysis (rigor)</td>
<td>Inaudible</td>
<td>Inaudible</td>
</tr>
</tbody>
</table>

Vascular Examination

**Figure 2-2.** Stepwise approach to the decision to operate, beginning with initial consultation or outpatient visit and ending, after complete evaluation has confirmed the patient to be a surgical candidate with a reasonable operating risk, with arteriography. PAOD, peripheral arterial occlusive disease.
Thank You