The Heart and Beyond: Diseases of the Circulatory System

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Atherosclerosis affects all arterial beds

Cerebrovascular disease
- Ischemic stroke
- Transient Ischaemic Attack (TIA)

Cardiovascular disease
- Heart Attack
- Angina (stable/unstable)

Peripheral arterial disease (PAD)
- Intermittent claudication
  - Pain on walking
- Severe limb ischaemia
  - Rest pain
  - Gangrene, necrosis
Where does PAD fit?

- Atherosclerosis is commonly found in more than one arterial bed
- PAD is often overlooked as one of the manifestations of atherosclerosis

Data from CAPRIE study (n=19,185). Figure adapted from Coccheri S. *Eur Heart J* 2002; 4 (Suppl B): B46-B49
PAD Prevalence

- 10-12 million in U.S.
- 30% symptomatic
- < 40% treated

Ankle Brachial Index (ABI)

Systolic ankle pressure (mm Hg)

Systolic brachial pressure (mm Hg)

- Simple diagnostic tool
- Use Doppler ultrasound probe and sphygmomanometer
- Office based
- Non invasive
- Patient lying flat
Ankle Brachial Pressure Index

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤0.5</td>
<td>Indicates severe disease. Consider referral to vascular specialist</td>
</tr>
<tr>
<td>&lt;0.9</td>
<td>Confirms PAD diagnosis. Initiate management and consider referral if quality of life issues</td>
</tr>
<tr>
<td>≥0.9</td>
<td>Consider referral to vascular specialist if patient has classic PAD symptoms</td>
</tr>
<tr>
<td>&gt;1.3</td>
<td>High. May be due to arterial wall stiffening, especially in patients with diabetes</td>
</tr>
</tbody>
</table>
Projected Increase in the Prevalence of PAD

Prevalence rate: 3%  8%  19%

Relative 5-Year Mortality Rates

Cause of Death in PAD Patients

- CAD: 50%
- CVA: 15%
- abdominal vascular: 10%
- nonvascular: 25%

*percentage of deaths attributed to a given cause
## Risk of a Second Vascular Event

<table>
<thead>
<tr>
<th>Original event</th>
<th>Heart Attack</th>
<th>Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Attack</td>
<td>5–7 x greater risk¹ (includes death)</td>
<td>3–4 x greater risk² (includes TIA)</td>
</tr>
<tr>
<td>Stroke</td>
<td>2–3 x greater risk² (includes angina and sudden death*)</td>
<td>9 x greater risk³</td>
</tr>
<tr>
<td>Peripheral arterial disease</td>
<td>4 x greater risk⁴ (includes only fatal MI and other CHD death†)</td>
<td>2–3 x greater risk³ (includes TIA)</td>
</tr>
</tbody>
</table>

¹ Includes death.
² Includes TIA.
³ Includes TIA.
⁴ Includes only fatal MI and other CHD death.
⁵ Includes angina and sudden death.
“Global Vascular Care”
Common Sites of Claudication

- **Obstruction in Aorta or iliac artery**
  - **Ischemia in**
    - Buttock, hip, Thigh and calf

- **Femoral artery or branches**
  - Thigh, calf

- **Popliteal artery**
  - Calf, ankle, foot
Why Endovascular Therapy?

- Minimally Invasive
- Increased safety
- Patient comfort
- Patient preference
- Less Expensive
- Glamorous
SFA Intervention - Nature of the Problem

- Contraction
- Torsion
- Compression
- Flexion
Nitinol self-expanding stent
Choosing the Right Stent

• Unique helical pattern enables multi-dimensional flexibility
  – Bending up to 180° or twisting without kinking
  – High radial strength
  – Low shear stresses
VIABAHN™ Endoprosthesis

- ePTFE lining with an external nitinol support
- No foreshortening
- Easy deployment
- 5 – 13 mm diameters
- 2.5 – 15 cm lengths
- 75 cm and 110 cm working lengths
- 8 Fr to 12 Fr sheaths required
Alternative Strategies: Debulking First
FoxHollow SilverHawk

- Excises large volumes of plaque from de novo and restenotic lesions
- Single-operator, monorail catheter that can treat multifocal and multivessel disease

SilverHawk System
Magnified Cutter View
Plaque Excised: 293 mg
Renal Artery Stenosis
10 clues to the diagnosis of Renovascular Disease

- Onset of HTN before 30 or after 55 yrs
- Exacerbation of previously well controlled hypertension
- Malignant hypertension
- Resistant hypertension
- Epigastric bruit (sound heard through stethoscope)
- Unexplained elevation of blood tests for kidney function
- Elevation of blood tests for kidney function while receiving ACE inhibitors
- Shrunken kidney or size discrepancy
- Atherosclerosis elsewhere
- “Flash” pulmonary edema or recurrent CHF
Update on Carotid Stenting
Carotid Artery

Blockage
Different types of protection devices

Angioguard, Cordis

7.5mm RX ACCUNET™

12 mm

Filter wire, EPI

PercuSurge Export™ Aspiration Catheter Mounted on GuardWire™