New Developments In And Present Status Of Diagnosis And Treatment For Popliteal Entrapment Syndromes

Niten Singh, MD
Professor of Surgery
University of Washington
Seattle, Washington

Disclosures

• None

Popliteal Entrapment Syndrome

• Background
  – Uncommon disorder
  – Compression of the popliteal artery
  – Symptoms of LE ischemia
  – Often seen in younger patients (athletes, soldiers)
  – Misdiagnosed
  – No standard protocol for diagnosis/treatment

Presentation

• Sinha et al.
  – Systemic review of 30 studies on PES
  – Intermittent claudication most common presenting symptom
  – Acute ischemia in 11% of patients
  – 15 of 30 studies revealed a median of 13.5% prevalence of post-stenotic dilatation
  – Median duration of symptoms was noted to be 12 months


Optimizing the Diagnosis

• History
  – High index of suspicion
  – Claudication in a young patient
  – Acute ischemia in same population
• PE
  – Pulse evaluation with provocative maneuvers
• Non-invasive Studies
  – Treadmill ABIs
  – Duplex US with provocative maneuvers

Duplex US at Rest
**Plantar Flexion**

**Axial Imaging**

- MRI/MRA
  - Identifies abnormal popliteal artery position or aberrant muscular slips
  - Imaging can be variable at different institutions
- CTA
  - Readily available
  - Reproducible but can still miss minor muscles slips
  - Both are static imaging

**Axial Imaging**

- Provocative imaging now commonly being employed
  - MRI provocation had a mean sensitivity of 94%
  - CT provocation demonstrated 100% sensitivity
  - Excellent potential but relies on protocols and if not done correctly exposure to radiation


**Arteriography**

- Can obtain detailed vascular findings
- Dynamic component much easier to visualize versus static imaging
- IVUS
  - Evaluation of intimal changes
  - Confirmation of area of compression

**Arteriography**

**IVUS**
**PES Treatment Options**

- Non-operative management not common
  - Young active patients
  - Repetitive trauma to the artery may lead to limb-threatening event
- Delayed presentation
  - Can be observed and curtail activities
  - Need monitoring of the artery with a duplex
- No endovascular solution without release of compression

**Surgical Approach**

- **Medial Approach**
  - Advantage: Most surgeons comfortable with this approach
  - Disadvantage: Visualization not optimal of the popliteal artery
- **Posterior Approach**
  - Advantage: Excellent visualization of the popliteal fossa
  - Disadvantage: Many surgeons not comfortable with this approach

**Posterior Approach**

**Dissecting the Popliteal Artery**

**Optimizing Treatment**

- Utilize *Intraoperative Duplex* to ensure adequate decompression of the popliteal artery

**Addition of Duplex US**

- Place US probe over popliteal artery to obtain a baseline in neutral position and confirm decrease with passive dorsiflexion
Operative Results

- Large series report nearly 100% return to prior level of activity
- Caveat of young patients not around for long-term follow-up
- Series with nearly 15% complication rate
  - Majority with wound issues


Conclusion

- Optimize the diagnosis
  - Strong index of suspicion in younger patients
  - Use of dynamic noninvasive studies to confirm PE findings (positional duplex)
  - Arteriography and IVUS as confirmatory studies
  - +/- axial imaging based on institutional expertise

- Optimize the treatment
  - Posterior approach allows for excellent exposure
  - Intraoperative duplex to confirm adequate decompression particularly for FPES