Popliteal Entrapment Syndromes: Optimizing Diagnosis and Treatment in 2015 and Beyond

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

Popliteal Entrapment Syndrome

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

Popliteal Entrapment Syndrome Classification

Type VI- functional popliteal entrapment syndrome (FPES)

• Gastrocnemius hypertrophy with compression of the popliteal artery as it passes through the soleal sling

• Compression with stress maneuvers but no anatomic abnormality making appropriate surgical resection difficult

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

Disclosures

• None
Positional Duplex

Baseline duplex

Plantar flexion

Axial Imaging

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

Imaging

- Arteriography
  - Can obtain detailed vascular findings
  - Dynamic component much easier to visualize versus static imaging
  - Utilization of IVUS to exam/confirm area of compression and look for intimal changes

Arteriography

- Baseline Image
- Initial Plantar Flexion
- Prolonged Plantar Flexion

IVUS

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
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

Perform Clinical Resection

Repeat Intraoperative Duplex

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