MEDICAL TREATMENT OF CLAUDICATION
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NO DISCLOSURES

Objectives
- Assess the benefit of an exercise program versus intervention versus medical therapy
- Assess the effectiveness of supervised versus unsupervised exercise programs
- Decide who and when to intervene. When is the exercise program failing?
- Brief review of symptoms and results
Our role

- The vascular surgeon is regularly placed in the roles of diagnostician, primary care provider, and non-operative therapist for patients with PAD, without the participation of an internal medicine specialist colleague. Thus, vascular surgeons must become as knowledgeable in non-operative as in operative treatment of vascular disease.

- Taylor, Moneta, Porter

Prevalence of PAD

- 2.2% of population in ages 38-82
- 17% of population in ages 55-70
- Many more are treated medically than operatively

Risk Factors

- Diabetes
- Cigarette smoking
- Hypertension
- Hyperlipidemia
Diabetes
- Remains a powerful risk factor
- Fourfold increase in PAD
- Driven by hyperglycemia and coexistent cardiovascular risk factors.

Smoking
- Smoking: Widmer and colleagues determined the relative risks at 2.3 for smoking alone, 3.3 for cigarettes and DM, and 6.3 with HTN added
- Must be aggressive with counseling
- Appreciate the power of this addiction

Hypertension
- Doubles the risk of PAD
- Most patients with PAD suffer with HTN as well
Hyperlipidemia
- PAD increases 10% for every 10mg/dl increase in total cholesterol
- HDL and triglycerides affect PAD more than LDL
- Treat with diet and exercise. This will only reduce by 10%
- Pharmacological additions are needed.

Claudication
- Definition:
  - Clinical condition of lower extremity muscle pain induced by exercise and relieved by short periods of rest. It is caused by fixed arterial obstruction at sites proximal to the affected muscle bed such that the normal exercise-induced increase in muscle blood flow cannot occur to a degree sufficient to meet the metabolic demands of exercising muscle.

Claudication cont.
- Most patients are asymptomatic…..at least they think they are.
- Various studies have shown 50-90% of patients with disease severe enough to cause claudication did not complain about this symptom to their physician
- Activity and profession play a role
  - Mailman versus the couch potato
Progression

- Smoking is the most consistent risk factors
  - 9 times higher risk of claudication
  - 98-99% of all patients who complain of claudication smoke cigarettes
  - Smoking must be addressed for any hope of halting disease progression

Progression cont.

Severity of initial arterial occlusive process assessed by symptoms, angiography and ABI

Patients with Diabetes have a higher risk of progression to gangrene and limb loss noted in some studies but not others

Classification

- TASC – Supra-inguinal disease
- TASC II – Infra-inguinal disease
- Rutherford class 1-3
- Stage 0 – Asymptomatic
- Stage 1 – Mild claudication
- Stage 2 – Moderate claudication – The distance that delineates mild, moderate and severe claudication is not specified in the Rutherford classification, but is mentioned in the Fontaine classification as 200 meters.
- Stage 3 – Severe claudication
- Stage 4 – Rest pain
- Stage 5 – Ischemic ulceration not exceeding ulcer of the digits of the foot
- Stage 6 – Severe ischemic ulcers or frank gangrene
Several thoughts on the mechanism:

- Frequent assumption is an increase in collateral vessels
- Other opinion is improved muscle performance resulting in adaptive changes in muscle enzymes leading to more efficient oxygen extraction from the blood
- There is no increase in the ABI
- Increase blood fluidity and decreased blood viscosity is also noted

J M T Perkins

Medical Management

- Risk factor modification
- Managing comorbidities
- Medications
- Patient education
- Exercise regimen

Medications

- Antihyperstensives
- Statins
- Cilostazol
  - Nitric-oxide associated vasodilation
  - Inhibits platelet activation and aggregation
  - Decreases thrombosis
  - Fairly successful in relieving claudication
Exercise Versus Intervention

- Does the location of the lesion make a difference?
  - Supra versus infra-inguinal
  - Infrapoliteal

- Does the activity of the patient matter?
  - Mailman vs couch potato

- Does patient compliance matter?
  - Do comorbidities make a difference?
    - If they can’t walk, how do they claudicate?

- What would the intervention entail?
  - Risk to benefit ratio

Exercise Therapy

Shown to increase walking distance and time
Many articles have shown this
ABI does not increase but symptoms decrease

Supervised vs unsupervised
Regensteiner et al showed a distinct benefit of supervised vs unsupervised exercise (n=20)
In another article they also showed 24 weeks of supervised exercise is better than 12 weeks

Supervised Exercise

- Hospital based
- Monitored
- Motivated and compliant patient
- Outcomes
- Spronk et al showed improved symptoms after 6 and 12 months with only the immediate benefits from intervention
- Creasy et al showed PTA increased ABI but did not improve mean walking distance but exercise did
- Personal patient success story
Unsupervised Exercise

- Compliance is a BIG issue
- How to monitor improvement
- No coaching
- Previous slides have shown the benefits of supervised exercise

CLEVER trial

- Aortoiliac disease only
- Supervised exercise vs stenting vs optimal medical therapy
- All on Cilostazol
- Outcomes...Study demonstrated that at 6 months Supervised exercise provided superior improvement in treadmill walking compared to optimal medical therapy AND Aortoiliac stenting

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Summary

- Claudication is more prevalent than patients think
- Exercise therapy can be successful and multiple articles show it to be as effective as intervention
- Maximize medical therapy for the best outcome and chance of success with exercise
- Smoking cessation is a must for best outcomes
- Intervene when they cannot exercise
<table>
<thead>
<tr>
<th>ABI value</th>
<th>Interpretation</th>
<th>Action</th>
<th>Nature of ulcers, if present</th>
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<tbody>
<tr>
<td>above 1.2</td>
<td>Abnormal Vessel hardening from PVD</td>
<td>Refer or measure Toe pressure</td>
<td>Venous ulcer use full compression bandaging</td>
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<tr>
<td>1.0 - 1.2</td>
<td>Normal range</td>
<td>None</td>
<td>None</td>
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<tr>
<td>0.90 - 0.99</td>
<td>Acceptable</td>
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<td>Some arterial disease</td>
<td>Manage risk factors</td>
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<td>0.50 - 0.79</td>
<td>Moderate arterial disease</td>
<td>Routine specialist referral</td>
<td>Mixed ulcers use reduced compression bandaging</td>
</tr>
<tr>
<td>under 0.50</td>
<td>Severe arterial disease</td>
<td>Urgent specialist referral</td>
<td>Arterial ulcer no compression bandaging use</td>
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