Vascular screening in diabetic patients: how aggressive should we be and when to intervene?
Disclosure

Speaker name: ROBERTO FERRARESI

I have the following potential conflicts of interest to report:

- Consulting: Medtronic, Abbott, Cook, LimFlow

No conflicts with this presentation
SYMPTOMS OF PAD IN DIABETICS

- Asymptomatic
- Claudication and/or rest pain
- CLI with tissue loss
SYMPTOMS OF PAD IN DIABETICS

Should we treat asymptomatic patients with "chronic subclinical ischemia"?
“Although this logical course of the disease is intellectually appealing, not all patients with CLI have experienced any symptoms of previous claudication.”
“...<25% of diabetics with PAD report intermittent claudication, and in DM pts with foot ulcers rest pain is substantially less frequent than in non-DM pts...”
Not claudication but “chronic subclinical ischemia” (TASC 2) or foot hibernation:

- impaired energy use
- hypotermia
- hypotrophic skin & muscles
- progressive neurological & orthopedical abnormalities

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diabetics

- asymptomatic

non diabetics

- claudication
- rest pain

- tissue loss

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Chronic subcritical limb ischemia represents a subgroup of patients with CLI in whom severely reduced circulation to the foot does not manifest as rest pain, ischemic ulceration, or ischemic gangrene. Admittedly, there is a paucity of data describing the fate of this patient subset, and little evidence to support appropriate treatment.

- cohort of 20 patients was examined
- mean follow-up of 1.9 years
- no deaths or major amputations, and **only one patient progressed to surgical intervention**
533 diabetic patients with unilateral CLI

6-year follow up

almost 50% of the diabetic patients with unilateral CLI developed a CLI in the contralateral limb

Incidence of CLI in the contralateral asymptomatic limb

Fig. 1. Kaplan–Meier estimate of cumulative incidence of CLI in contralateral limb (N = 184).
Risk factor for developing CLI on the contralateral limb was skin perfusion pressure (SPP) <40mmHg at the surgery for ipsilateral limb. The presence of SPP < 40 mmHg and end stage renal failure with hemodialysis resulted in a significant high probability of tissue loss.
Incidence of critical limb ischemia and amputation outcome in contralateral limb in diabetic patients hospitalized for unilateral critical limb ischemia during 1999–2003 and followed-up until 2005

Erizo Figlia , Giacomo Clerici, Mammela Mentres, Maurizio Capirola, Antonella Quaratini, Vincenzo Cani, Alberto Morabito

Fate of the asymptomatic contralateral limb after initial intervention for ipsilateral critical limb ischemia


Int Angiol 2013;320:526-31
...attentive medical care and risk-reduction strategies may reduce mortality and alter progression of limb ischemia to amputation in patients with chronic subcritical limb ischemia.

... both severity of foot lesion and amputation level was significantly lower. This fact can be due to prompt therapeutic interventions...

Skin perfusion pressure <40 mmHg and ESRD in hemodialysis identify asymptomatic limbs at high risk of developing CLI and tissue loss.
Asymptomatic Symptoms of PAD in Diabetics

- Attentive medical care
- Risk-reduction strategies
- Prompt therapeutic interventions

Wait!
SYMPTOMS OF PAD IN DIABETICS

claudication and/or rest pain
“…<25% of diabetics with PAD report intermittent claudication, and in DM pts with foot ulcers rest pain is substantially less frequent than in non-DM pts…”
Peripheral Arterial Disease

Risk factor modification:
- Smoking cessation
- LDL cholesterol < 100 mg/dL
- LDL < 70mg/dL if high risk
- HbA1c < 7.0%
- BP < 140/90 mmHg
- BP < 130/80 mmHg if diabetic or renal disease
- Antiplatelet therapy

No limitation to quality of life or reduced exercise capacity:
- Monitor patient for loss of function

Limitation that affects quality of life:
- History of significant exercise limitation
- Reduced treadmill performance
- Reduced function by questionnaire

Claudication medical therapy
- Supervised exercise or pharmacotherapy (see section C.2.4.1)

Improved symptoms
- Continue

Symptoms not improved or deteriorated
- Localize the lesion:
  - Conventional angio
  - MRA or CTA
  - Ultrasound
  - Hemodynamic localization

Revascularization
- Endovascular
- Surgical

Revascularization therapy only in case of proximal lesion
SYMPTOMS OF PAD IN DIABETICS

claudication and/or rest pain

“FOCAL” REVASC.
SYMPTOMS OF PAD IN DIABETICS

CLI with tissue loss

What type of screening?

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### I: Ischemia

Hemodynamics/perfusion: Measure TP or TePO$_2$ if ABI incompressible (>1.3)

SVS grades 0 (none), 1 (mild), 2 (moderate), and 3 (severe).

<table>
<thead>
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<th>ABI</th>
<th>Ankle systolic pressure</th>
<th>TP, TePO$_2$</th>
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<tr>
<td>0</td>
<td>≥0.80</td>
<td>&gt;100 mm Hg</td>
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The Society for Vascular Surgery Lower Extremity Threatened Limb Classification System: Risk stratification based on Wound, Ischemia, and foot Infection (WIFI)

J Vasc Surg 2014;59:220-34

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Hemodynamics/perfusion: Measure TP or TePO₂ if ABI incompressible (>1.3) SVS grades 0 (least severe), 1 (moderate), 2 (moderate-severe), or 3 (severe).
Conclusions: Below-knee vascular calcification gave a high rate of false negative results for ankle brachial index.

For diagnosis of CLI in diabetic patients ..., measurement of TcPO2 is essential not only when AP is not measurable but also when this value is ≥70 mm Hg.
Conclusion: TcPO2 levels < 34 mmHg indicate the need for revascularization, while for values ≥34 <40 mmHg this need appears less pressing, although there remains a considerable probability of amputation. TcPO2 levels greater than 40 mmHg suggest that revascularization is dependent on the severity of tissue loss and possible morbidity caused by the procedure.
SYMPTOMS OF PAD IN DIABETICS

TcPO\textsubscript{2} <40 mmHg

Angio + Rev.

CLI with tissue loss

What type of screening?

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SYMPTOMS OF PAD IN DIABETICS

TcPO₂ <40 mmHg

Angio + Rev.

Is it all what we need?
Nothing more?

CLI with tissue loss

What type of screening?

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I: Ischemia

Hemodynamics/perfusion: Measure TP or TcPO2 if ABI incompressible (>1.3)
SVS grades 0 (none), 1 (mild), 2 (moderate), and 3 (severe).

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Predictive Values of Transcutaneous Oxygen Tension for Above-the-ankle Amputation in Diabetic Patients with Critical Limb Ischemia

E. Faglia, G. Clerici, M. Caminiti, A. Quarantiello, V. Curci and A. Morabito

Eur J Vasc Endovasc Surg 33, 731–736 (2007)

Conclusion: TcPO2 levels < 34 mmHg indicate the need for revascularization, while for values ≥34 <40 mmHg this need appears less pressing, although there remains a considerable probability of amputation. TcPO2 levels greater than 40 mmHg suggest that revascularization is dependent on the severity of tissue loss and possible morbidity caused by the procedure.
Critical limb ischemia or Critical wound ischemia?

Definition of Critical Limb ischemia

Critical Wound Ischemia

Direct blood flow based on the angiosome concept is important for limb salvage in patients with CLI:

Wound Related Artery
• Male 66 yy old
• Type 2 DM, 25 yy
• After a long walk in the mountain, superficial ulcer in the heel region

Deep Infected heel ulcer
180 days later
SYMPTOMS OF PAD IN DIABETICS

CLI with tissue loss

Aggressive Revasc.

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SYMPTOMS OF PAD IN DIABETICS

- Asymptomatic
- Claudication and/or rest pain
- CLI with tissue loss

- Wait!
- “Focal” Revasc.
- Aggressive Revasc.
Asymptomatic claudication and/or rest pain CLI with tissue loss

SYMPTOMS OF PAD IN DIABETICS

Treat the patient (the crucial presenting symptom) and not the ANGIO

Asymptomatic → Wait!

CLI with tissue loss → Aggressive Revasc.
Vascular screening in diabetic patients: how aggressive should we be and when to intervene?

Roberto Ferraresi
Peripheral Interventional Unit
Bergamo – Italy
www.robertoferraresi.it