How To Measure Foot Perfusion After Tibial Interventions: These Measurements Are More Important Than Angiosomes

Werner Lang, MD
Chairman, Department of Vascular Surgery, University Hospital Erlangen

Why perfusion measurements?

• After successful revascularisation 10-18% of ischemic ulcers are non-healing*
• Look at: tissue perfusion, not only results of angiography

Best timing:
during or immediately after the intervention
“on table” measurements !?

Influence of the pedal arch

Pedal runoff score
no significant differences
wound-healing time (P=0.138) and
wound-healing rate (P=0.553)

Results OLIVE investigators

with and without pedal arch

with Limb salvage rate at 1 y 98.4% vs. 89.3%, P=0.03

without Wound healing rate 89.4% vs. 80.6%, P=0.11

*Blevins WA. Eur J Vasc Endovasc Surg


Higashimori A. et al. Catheterization and Cardiovascular Interventions 2015;87:129-133

no disclosures
Ischemia calculated in WIFI

<table>
<thead>
<tr>
<th>Grade</th>
<th>ABI</th>
<th>Ankle syst. pressure</th>
<th>TP, TCPO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>≤ 0.8</td>
<td>&gt; 100 mmHg</td>
<td>≥ 60 mmHg</td>
</tr>
<tr>
<td>1</td>
<td>0.6-0.79</td>
<td>70-100 mmHg</td>
<td>40-59 mmHg</td>
</tr>
<tr>
<td>2</td>
<td>0.4-0.59</td>
<td>50-69 mmHg</td>
<td>30-39 mmHg</td>
</tr>
<tr>
<td>3</td>
<td>≤ 0.39</td>
<td>&lt; 50 mmHg</td>
<td>&lt; 30 mmHg</td>
</tr>
</tbody>
</table>


TcPO₂ - Time consuming

Measuring Transcutaneous Oxygenation to Validate the Duration Required to Achieve Electrode Equilibration
Chaur, Nathaniel, MBOH, Jain, Jitesh, K., MBBBS, BPhlebSc; Steigh, Jamie, MBOH, MD, FANZCA; Vautevan, Rhudur, MD, FRACS

Takes 15 minutes to achieve constant values

Transcutaneous oxygen tension measurements following peripheral transluminal angioplasty procedure has more specificity and sensitivity than ankle brachial index

TcPO₂ measurements following angioplasty procedure: more specificity and sensitivity than does the ABI

White light spectrometry

Critical values of O2C-method

SO₂ above 10%: no hypoxia
SO₂ below 30%: healing cannot predicted
Venous stasis: rHb above 90 AU
O2C-METHOD

Distribution of probes

Perfusion before and after angioplasty

Measurements during angioplasty

DR or IR revascularization

**Significant improvement irrespective of angiosomes**

<table>
<thead>
<tr>
<th>Single vessel only</th>
<th>Measure</th>
<th>Sign. (P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR angiosomes</td>
<td>$SO_2$</td>
<td>.004</td>
</tr>
<tr>
<td>IR angiosomes</td>
<td>Flow</td>
<td>.013</td>
</tr>
</tbody>
</table>

**Conclusion**

TcPO2 still represented in guidelines should be replaced

Angiosome concept is not helpful collaterals, overlap of wounds

Angiography alone fails to prove effect of Tx in CLI patients with tibial lesions

Methods should be able to measure tissue perfusion pre, during and after tibial intervention