Critique of the angiosome concept
It is not simple: outcomes depend more on the distribution system in the foot than angiosome

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Disclosure
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I have the following potential conflicts of interest to report:
consulting, travel reimbursement, teaching courses, training, proctoring:

• Medtronic
• Boston Scientific
• Abbott
• LimFlow
• Terumo
• Cook
• Biotronik

The angiosome concept in real practice

1. Angiosome-targeted Lower Limb Revascularization for Ischemic Foot Wounds: Systematic Review and Meta-analysis
E/ES 2014;47:517-22

2. VES CME
Systematic Review and Meta-analysis of Direct versus Indirect Angiosomal Revascularisation of Infrainguinal Arteries
R. Ferraresi*, C. Calabro*, I. Ceriani*, I. Fanti,
R. Ferraresi, MD, Bergamo – Italy

3. Direct Revascularization With the Angiosome Concept for Lower Limb Ischemia
A Systematic Review and Meta-analysis
Yi-Lei Xiao, MD, PhD, Yao-Mei Wang, MD, PhD, Feng-Yu Wang, MD, PhD, Yang Fu, MD, PhD, Feng Chu, MD, PhD, Xi-Jian Chen, MD, PhD
(The American Journal of Surgery) 2021;221(1):130-140

When feasible, direct revascularization according to the angiosome concept seems to be better than indirect revascularization in terms of wound healing and limb salvage

4 critics

When feasible, direct revascularization according to the angiosome concept seems to be better than indirect revascularization in terms of wound healing and limb salvage

1. We can assume that the operators focused on traditional optimal technical targets rather than the WRA

2. We don’t know if the same patients would have been technically revascularizable following an angiosome-oriented approach.

3. It is possible that in the “indirect revascularization” groups there was a propensity to collect patients with the most technically challenging disease and the differences in the outcomes may simply reveal basal differences in the extension and type of obstructive disease

All of the studies comparing direct and indirect revascularization are retrospective

1st CRITIC
Try to do what is possible and don’t lose time on unrealistic targets!

Direct revascularization could have a different value depending on the presence or not of a good distal distribution network.

Good distal distribution system

Inadequate distal distribution system

Varela et al. demonstrated that the restoration of blood flow to the ulcer through collateral vessels (pedal and distal peroneal branches) provided similar results to those obtained through its specific source artery in terms of healing and limb salvage.

Kawarada et al. demonstrated that a single fibular artery revascularization, whether of the ATA or PTA, yielded comparable improvements in microcirculation of the dorsal and plantar foot.

Good distal distribution system

Inadequate distal distribution system

In diabetic and ESRD pts collateral vessels formation is reduced or absent → foot circulation becomes functionally terminal because of lack of collaterals. This is the reason why we need to improve the most direct blood flow to the wounded area.

Azuma et al. demonstrated that in bypass surgery the angiosome concept seems unimportant, at least in non-ESRD cases. “We believe that a good artery with good runoff to the foot, regardless of the angiosome, should be selected in non-ESRD pts... On the other hand, angiosome-oriented target selection might improve the poorer outcomes in ESRD pts.”
The value of an angiosome-oriented revascularization is inversely related to the function of collateral vessels.

Not every wound, especially in case of deep infection, is confined into a single angiosome space; patients with extensive tissue damage cannot be classified on the basis of an angiosome-oriented revascularization.

<table>
<thead>
<tr>
<th>Open BTK vessels</th>
<th>Limb salvage</th>
<th>0</th>
<th>56%</th>
<th>2 better than 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>73%</td>
<td>2-3 better than 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>80%</td>
<td>2 better than 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>83%</td>
<td>2 better than 0</td>
</tr>
</tbody>
</table>

PTA of tibial arteries had a better outcome than PTA of the peroneal artery alone.

Extensive tissue damage cannot be classified on the basis of an angiosome-oriented scheme. In these patients complete rev. better than partial rev.

Forefoot amputations (rays, trans-metatarsal, Lisfranc, Chopart) are a common cause of foot circle interruption. In these cases we must pursue the "surgical WRA" revascularization.

"Willis like" foot circle
This patient has a pure neuropathic history; the arteriopathy was mild and was not responsible of the plantar lesion and of the catastrophic evolution in forefoot amputation.

Why has the plantar edge of the amputation an ischemic suffering?

In this patient there is an ischemic suffering of the plantar edge of the amputation without healing.

Forefoot amputations can interrupt the foot circle. In these cases we must pursue the "surgical WRA" revascularization.