Pros and Cons About the Angiosome Concept: What Is Its Real Value and How Can It Improve Limb Salvage?

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The Angiosome Concept

- Taylor and Palmer (1987)
- The angiosome
  - 3 dimensional network of vessels
  - Supplies tissues between skin and bone
  - Specific arterial/venous supply
  - Anastomotic connections between vessels
- Over 40 angiosomes in the human body
- 5 in the lower extremity

The Angiosome Concept: Foot/Ankle

- Anterior Tibial
- Dorsalis Pedis
- Peroneal
- Lateral calcaneal
- Anterior perforator
- Posterior Tibial
- Medial plantar
- Lateral plantar
- Calcaneal

The hypotheses

- Angiosome-guided revascularization can improve limb salvage rates
- Direct angiosome revascularization will have improved rates of wound healing compared to indirect strategies

Clinical questions

- Endovascular revascularization
- Traditional ("open") revascularization
- Role of collateral flow
- Impact of patient comorbidities

Angiosome-based Revascularization

- Retrospective
- CLI (87% diabetic, 52% ESRD)
- Tibial bypass: GSV, PTFE w/ vein patch
- Variable: Direct or Indirect
- Outcomes
- Wound healing
- Amputation

Revascularization of a Specific Angiosome for Limb Salvage: Does the Target Artery Matter?


DR for open bypass
Angiosomes in the Literature

Pubmed: Angiosomes and Vascular Surgery

Clinical implications of the angiosome model in peripheral vascular disease


- Systematic Review: 2009-2013
  - Patient characteristics
  - Open/Endovascular/Hybrid
  - Direct/Indirect revascularization

- Outcomes
  - Limb salvage
  - Wound healing

Need More Evidence

- Systematic Review: 2009-2013
  - Patient characteristics
  - Open/Endovascular/Hybrid
  - Direct/Indirect revascularization

- Outcomes
  - Limb salvage
  - Wound healing

- n=11 → n=22

- Literature remains low-quality
- DR superior to IR for wound healing for endo only
- DR is superior to IR for limb salvage for both open and endo
- Effect more pronounced for endo

Angiosome-based Revascularization

- Reality and caveats

Combined revascularization

- Amputation free survival:
  - No significant difference between combined and DR
  - Significant improvement over IR
Summary: Angiosomes and Limb Salvage

Pros
• Conceptual Framework
• Vascular specific anatomy
• Common verbiage
• Increasing evidence toward efficacy

Cons
• Not universal
• Effect not absolute
• Does not provide definitive guidance
• Tendency, not exclusivity
• Literature poor quality

Conclusion and Recommendation

• Everything old is new again:
  • “In-line flow”
    • Restore flow to the affected area, whether it be DR or IR.
  • Improved outcomes when direct collaterals available (e.g. pedal arch intact)
  • Lots of discussion of data sets, not many original data sets over 30 years
  • Expected maturation in theory and subtleties in future literature

Thank you

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