

Novel Uses of Selective Superficial Venous Arterialization to Achieve Limb Salvage

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Conflicts

- InspireMD
 - MedAlliance/Cordis
 - Aveera
 - Protexa
 - Pulse Therapeutics
- Research Funding (Co-PI)*
Advisory Board, Equity
Advisory Board, Equity
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WUSM Vascular + Plastic Microsurgery Team with Dr. John Felder (*Corewell Beaumont*)

- Tissue loss (Rutherford 6/ W3) incompatible with wound closure/salvage
- Tibial and pedal calcification that precludes inframalleolar bypass and limits small vessel perfusion
- Pedal MAC scores independently predict poor outcomes*
- How can we bridge these gaps?

- Liu et al, J Vasc Surg 2022



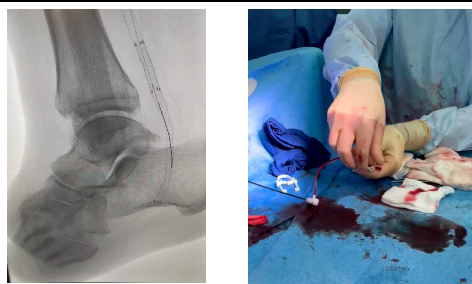
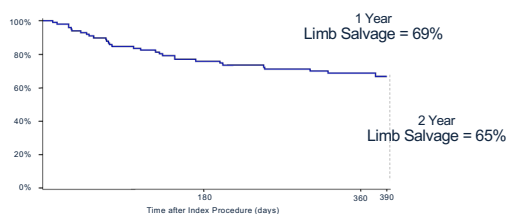
Deep Vein Arterialization (TADV)

- Renders pedal perfusion less dependent upon nutrient flow through heavily calcified macro- and micro-vessels
- Arteriovenous crossover accomplished in proximal calf where calcium burden is often less severe
- Case prep: vein mapping to visualize posterior tibial and lateral plantar vein diameters (tourniquet) and anatomic suitability




Limb Salvage Durability Demonstrated at 1 and 2 Years

PROMISE II Trial
 NCT03970538

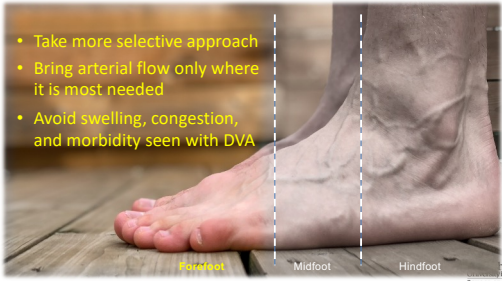


- "Off the shelf" DVA
- 18 months, arterialized waveform
- Durable healing of proximal (near cuboidal) open TMA
- Early venous congestion & pain
- Occasional limb loss due to late infection of granulating wound
- Can we do better?




New Approach: "Distal foot arterialization" (DFA)

- Take more selective approach
- Bring arterial flow only where it is most needed
- Avoid swelling, congestion, and morbidity seen with DVA




Microvascular Foot Arterialization with Flow-Through Free Flaps

- Facilitates aggressive debridement of all nonviable tissue with immediate coverage/closure
- Selective distal venous arterialization (DFA) bridges arterial flow to the forefoot
- Flaps "cannibalize" flow over time and will usually remain viable even if primary pedicle fails after 6 months



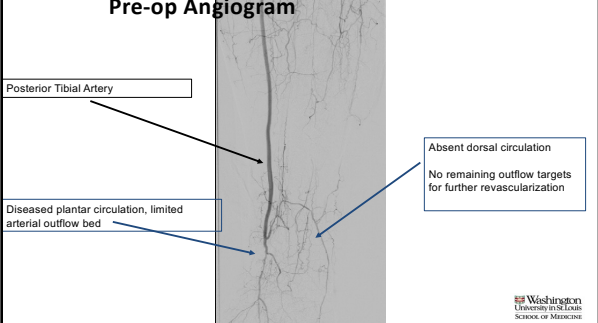

CASE 1

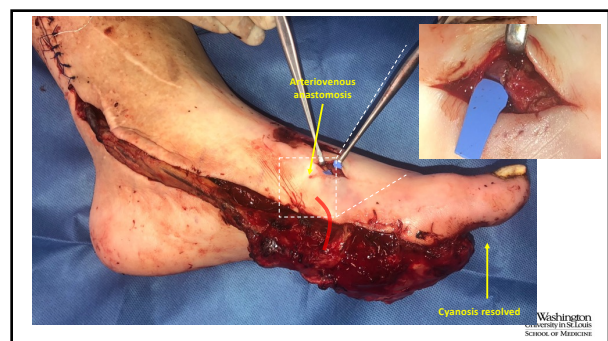
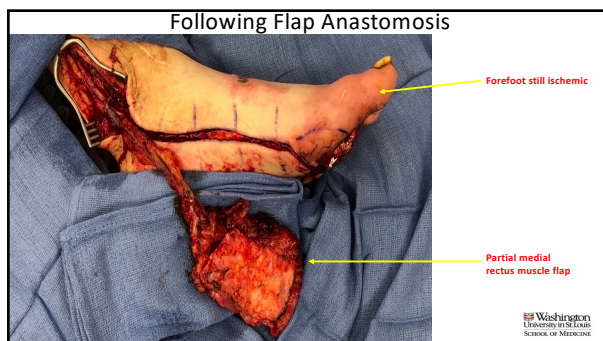
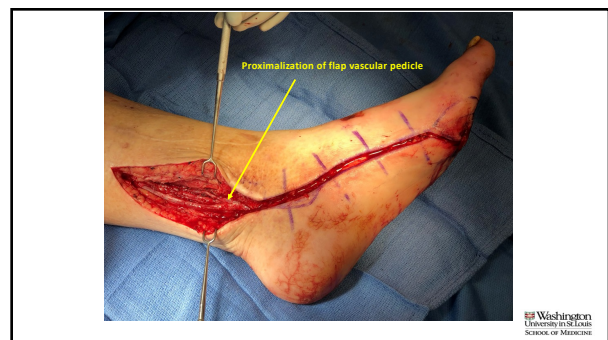
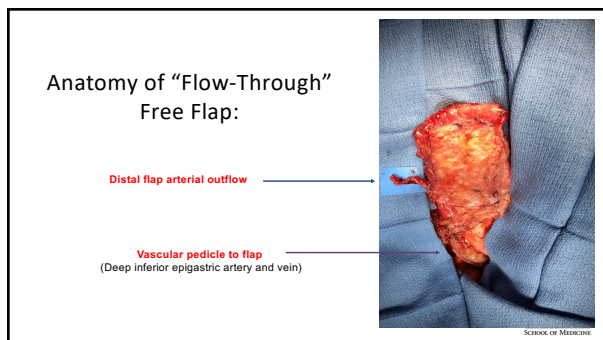
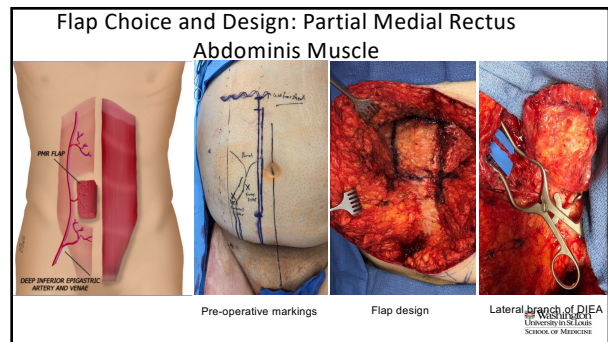
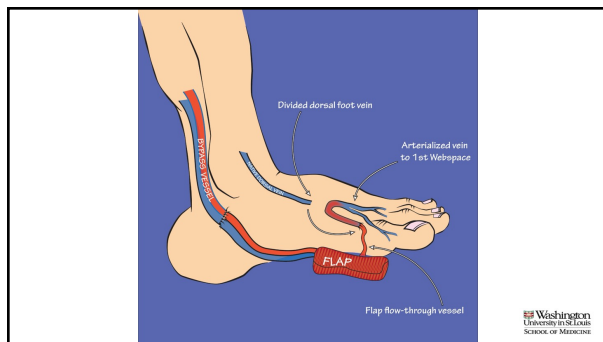


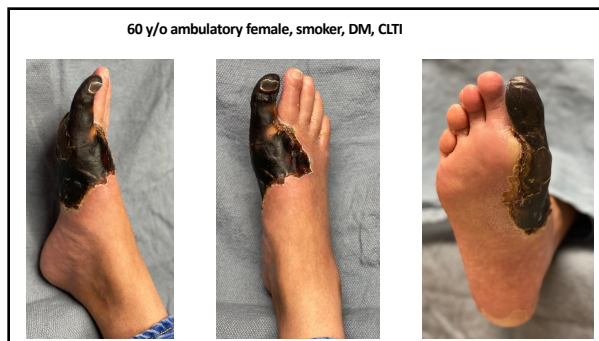
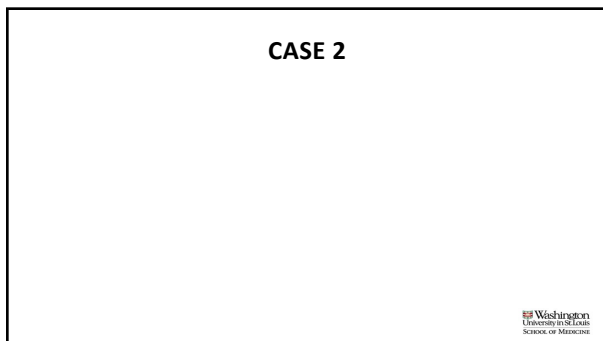
48 y/o ambulatory male, DM, PVD, Nonsmoker. + Osteomyelitis.

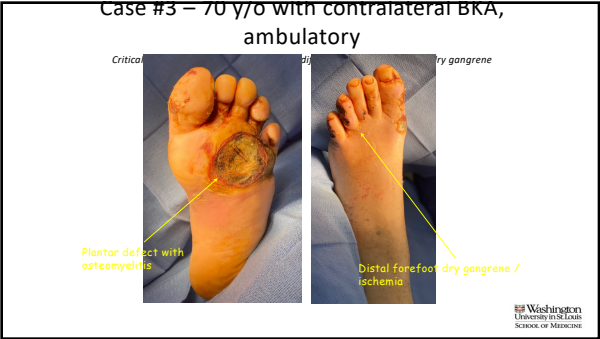
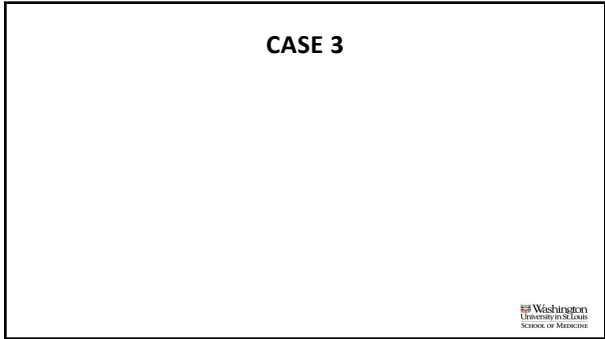
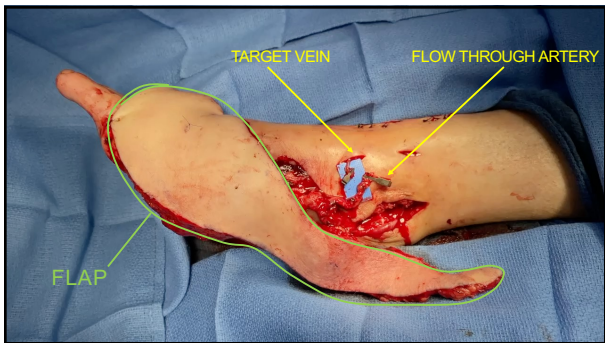
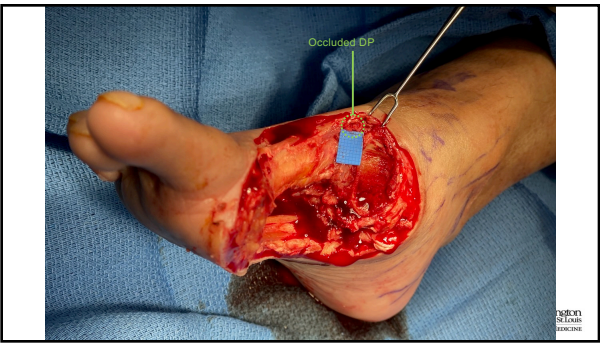


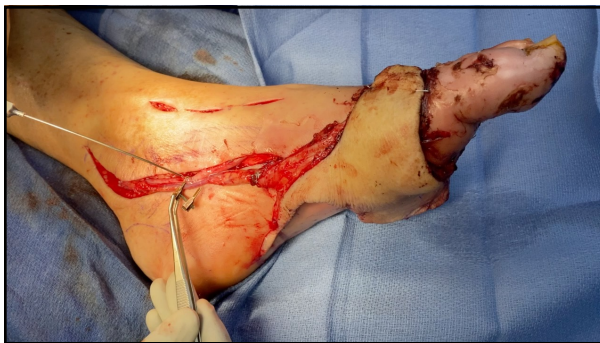
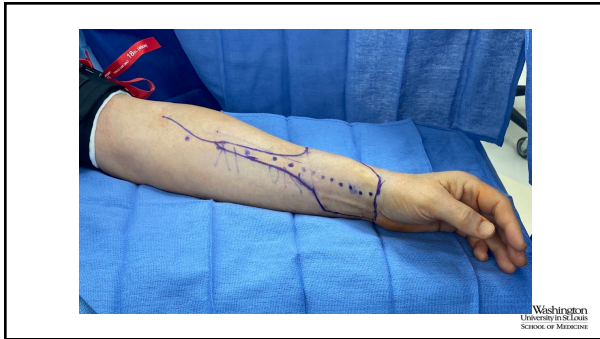
Pre-op Angiogram









Microvascular DFA - Summary

<p>Indications:</p> <ul style="list-style-type: none"> • Pulsatile donor artery at ankle level • Terminal small vessel arteriosclerosis of foot (SAD) • Tissue loss limited to digits, plantar forefoot and midfoot • Intact medial marginal vein (MMV) and dorsal venous arch 	<p>Benefits:</p> <ul style="list-style-type: none"> • Extends indications for soft tissue reconstruction • Provides <i>durable</i> salvage by creating new arterial network <ul style="list-style-type: none"> – (1st case is now 5 yrs post op) • Increases outflow bed for bypass or revasc
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Every Limb Preservation Team Needs A Dedicated Microvascular Surgeon

- Arterial revascularization targets specific new goals: flap inflow as well as generic pedal inflow
- Coverage options are almost inconceivable
- Immediate restaging from W3 -> W0 wound grade

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