2017 MID-ATLANTIC
CONFERENCE

7th ANNUAL CURRENT CONCEPTS IN
VASCULAR THERAPIES

2017

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4/21/17

Diabetic Patients with Critical Limb Ischemia Vein Bypass is the way to Go: Direct flow to the Foot

DM and Amputations

- Diabetic pt's are 15-30 times more likely to have an amputation compared to nondiabetics.
- 70-80% of all nontraumatic amputations occurs in people with diabetes.
- Survival rates for pt's with an AKA or BKA is 62% at 1yr and 29% at 5yrs.

Critical limb ischemia

Critical limb ischemia

- Rest pain
- Tissue lose
- Ankle pressure <40

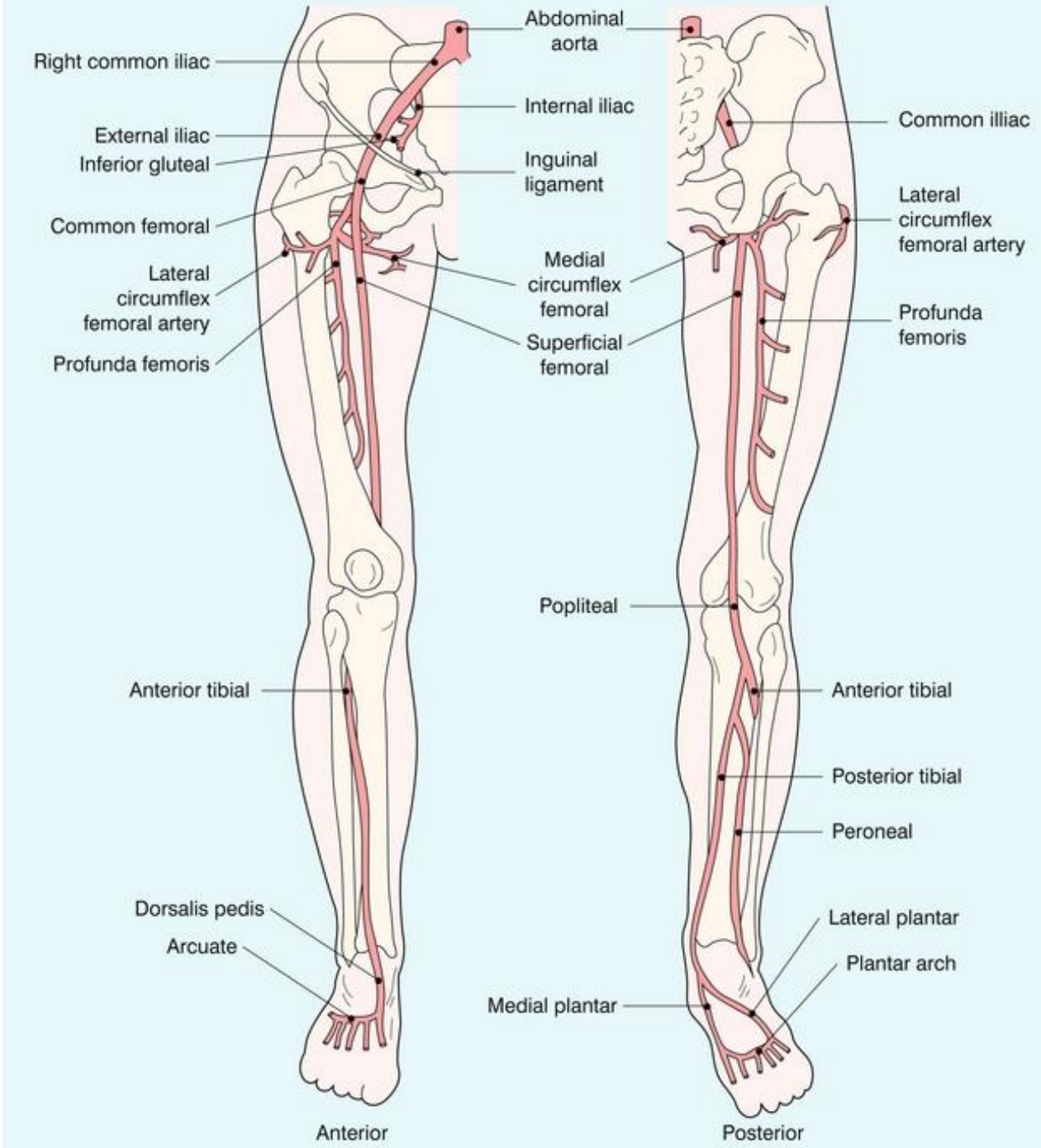
- Only 5% achieved limb salvage without revascularization at one yr

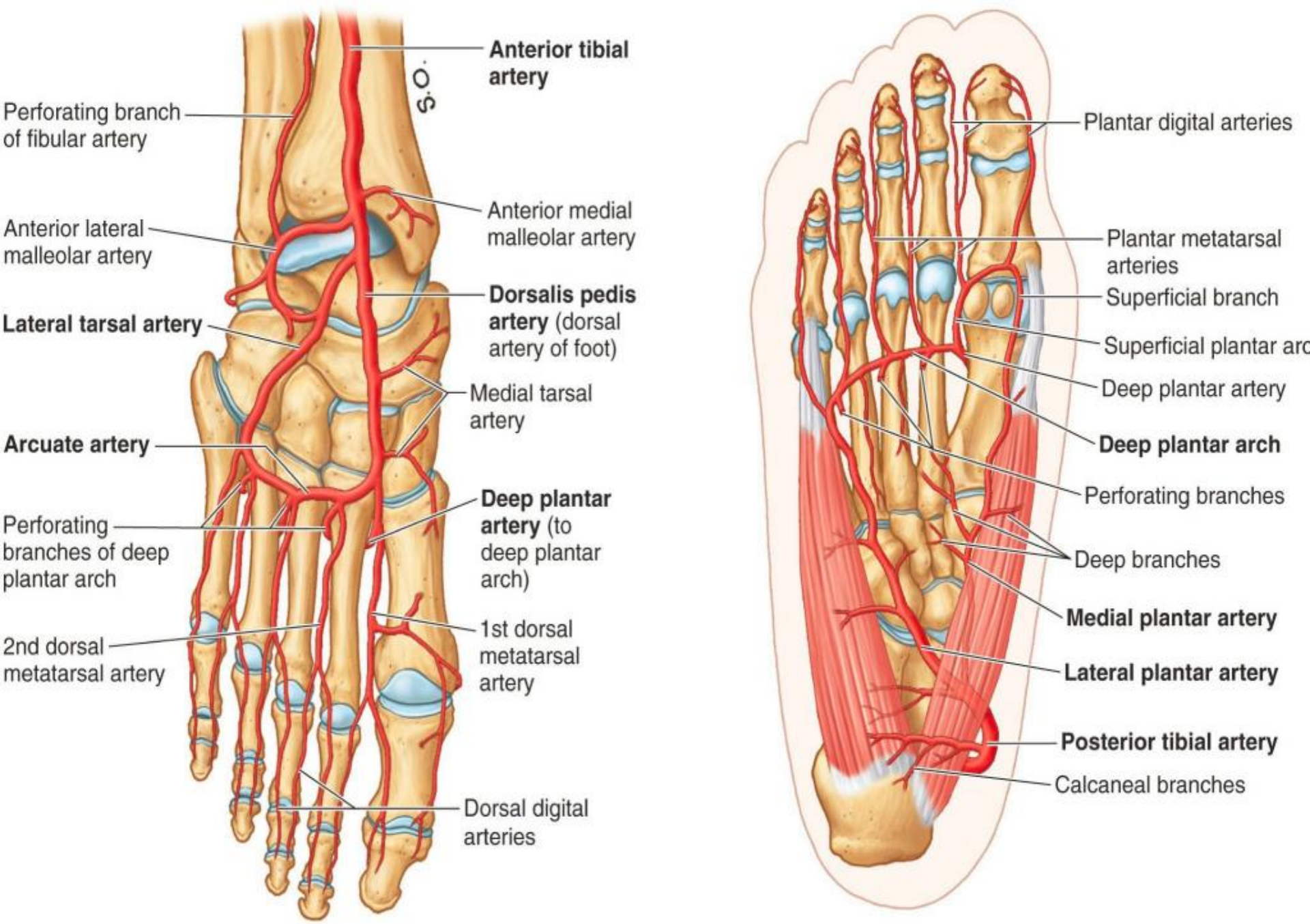
Critical limb ischemia with tissue loss requires direct flow into the foot. Anything less than a pulse in the foot will likely not heal the wound. Especially in Diabetics!

- While blind segment bypasses or revascularizations may work for claudicators or occasionally rest pain they are inadequate for CLI.

A palpable pulse is optimal.

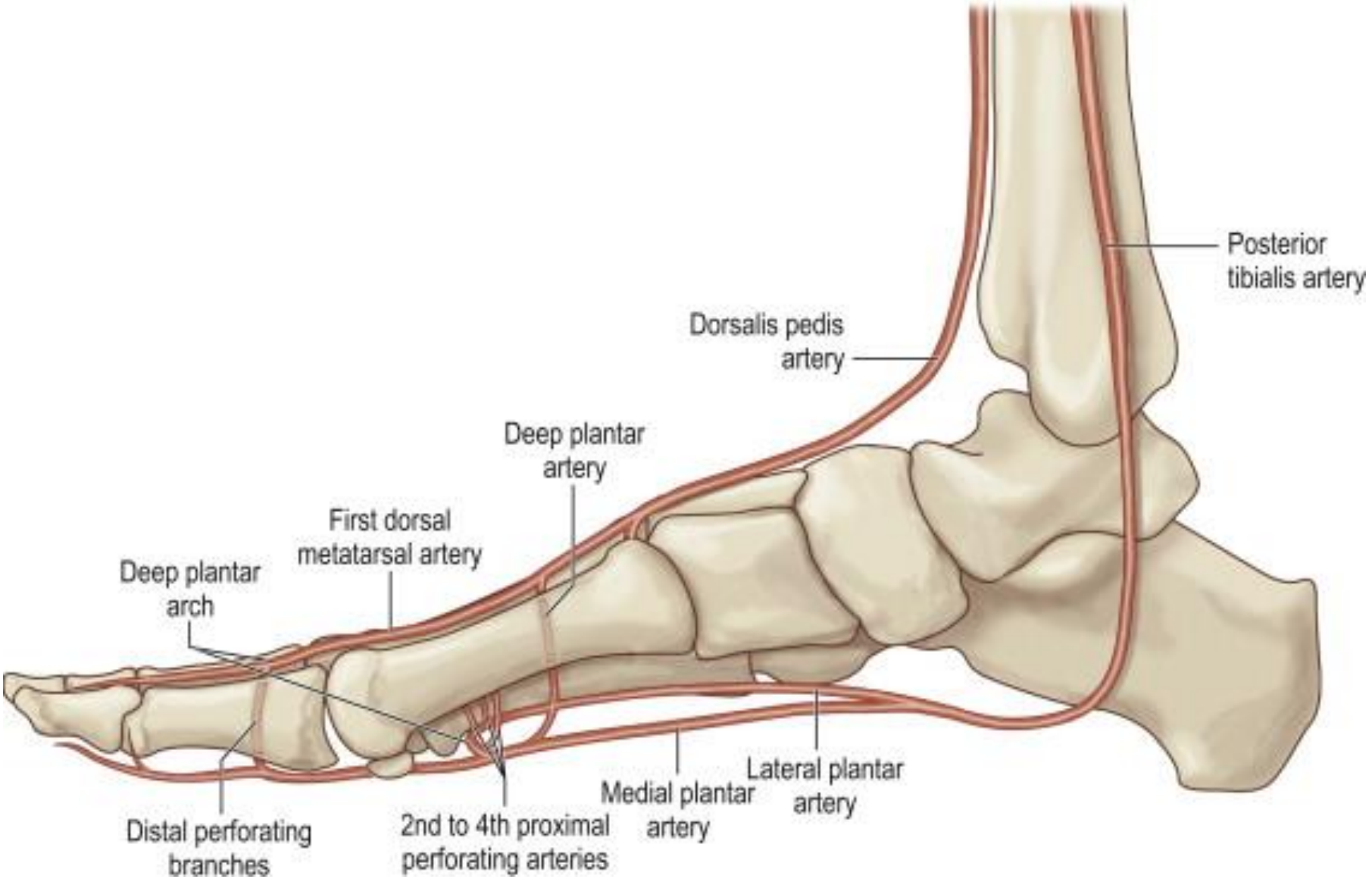
A doppler signal alone is likely inadequate.

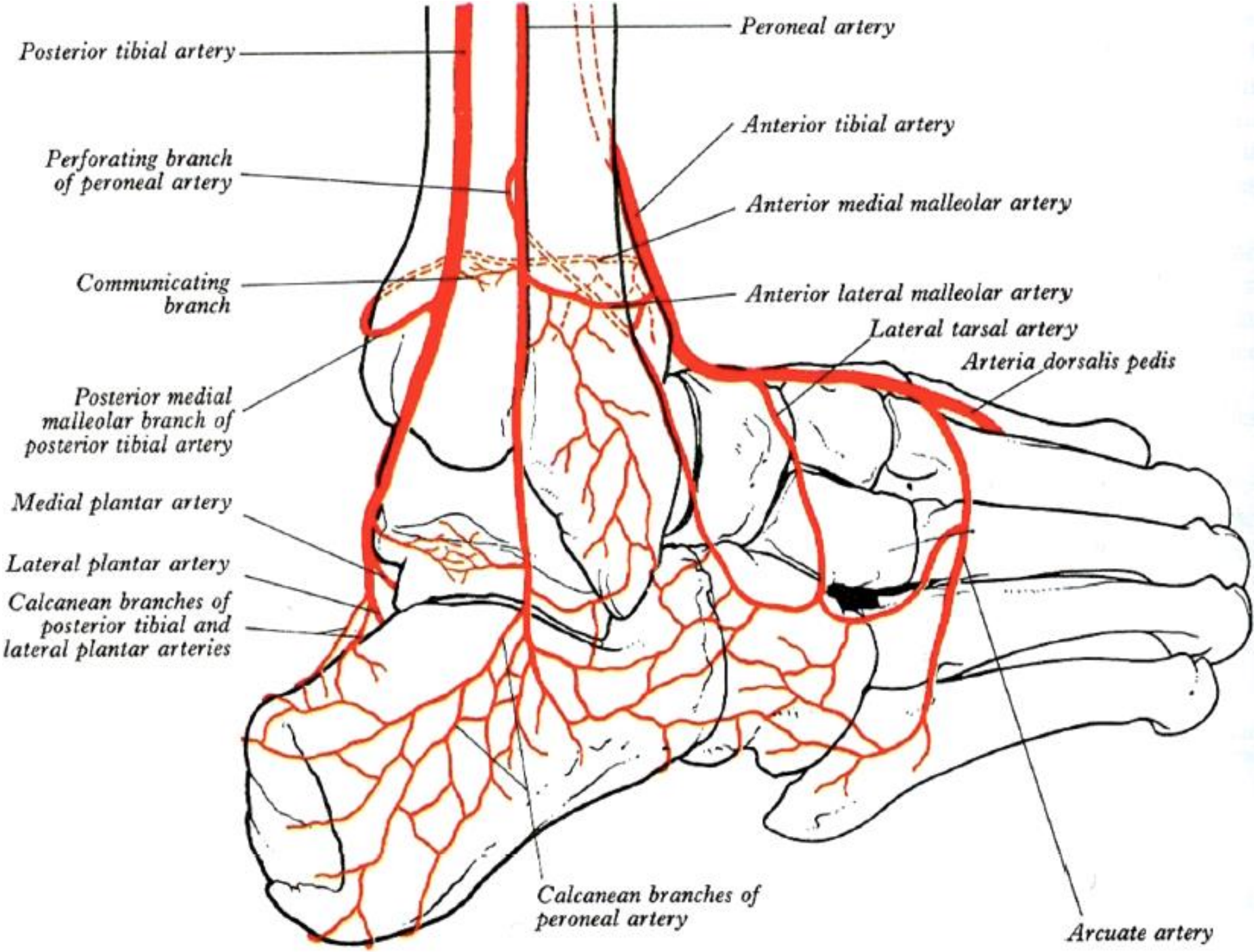

Abdominal aorta
Right common iliac
Internal iliac
External iliac
Inferior gluteal
Inguinal ligament
Common femoral
Lateral circumflex femoral artery
Profunda femoris
Medial circumflex femoral
Superficial femoral
Common illiac
Lateral circumflex femoral artery
Profunda femoris
Popliteal
Anterior tibial
Anterior tibial
Posterior tibial
Peroneal
Dorsalis pedis
Arcuate
Lateral plantar
Plantar arch
Medial plantar
Anterior
Posterior



(A) Dorsum of foot

(B) Plantar aspect of foot


Posterior tibialis artery
Dorsalis pedis artery
Deep plantar artery
First dorsal metatarsal artery
Deep plantar arch
Lateral plantar artery
Medial plantar artery
2nd to 4th proximal perforating arteries
Distal perforating branches


Posterior tibial artery
Peroneal artery
Anterior tibial artery
Perforating branch of peroneal artery
Anterior medial malleolar artery
Communicating branch
Anterior lateral malleolar artery
Lateral tarsal artery
Arteria dorsalis pedis
Posterior medial malleolar branch of posterior tibial artery
Medial plantar artery
Lateral plantar artery
Calcanean branches of posterior tibial and lateral plantar arteries
Calcanean branches of peroneal artery
Arcuate artery

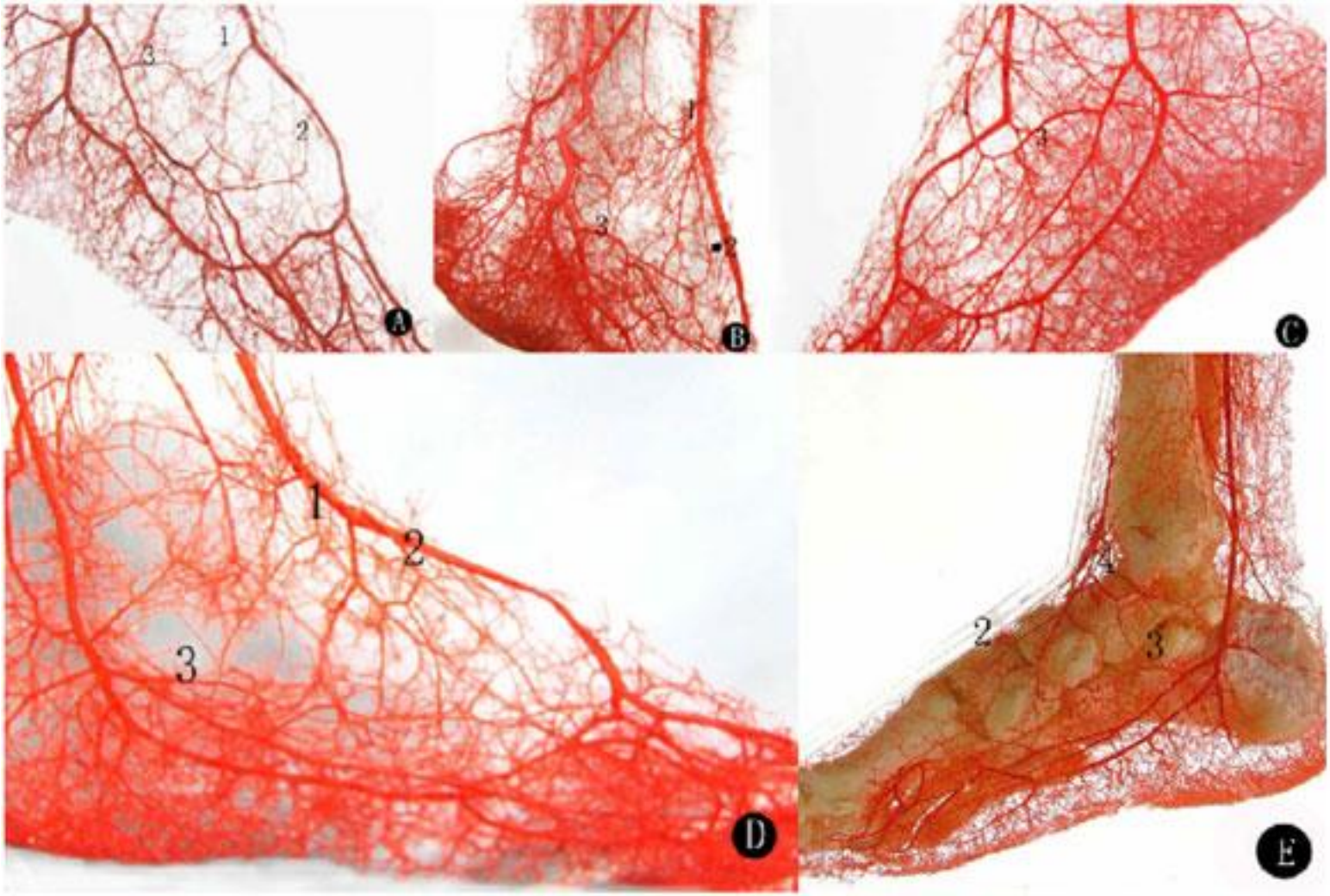
Small Vessel Disease

- It was once thought to be the primary cause of Diabetic foot ulcers.
- Now understood that small vessel disease, (microangiopathy), contributes to poor ulcer healing in the neuroischemic diabetic foot but that macrovascular disease is an important and often treatable contributor.

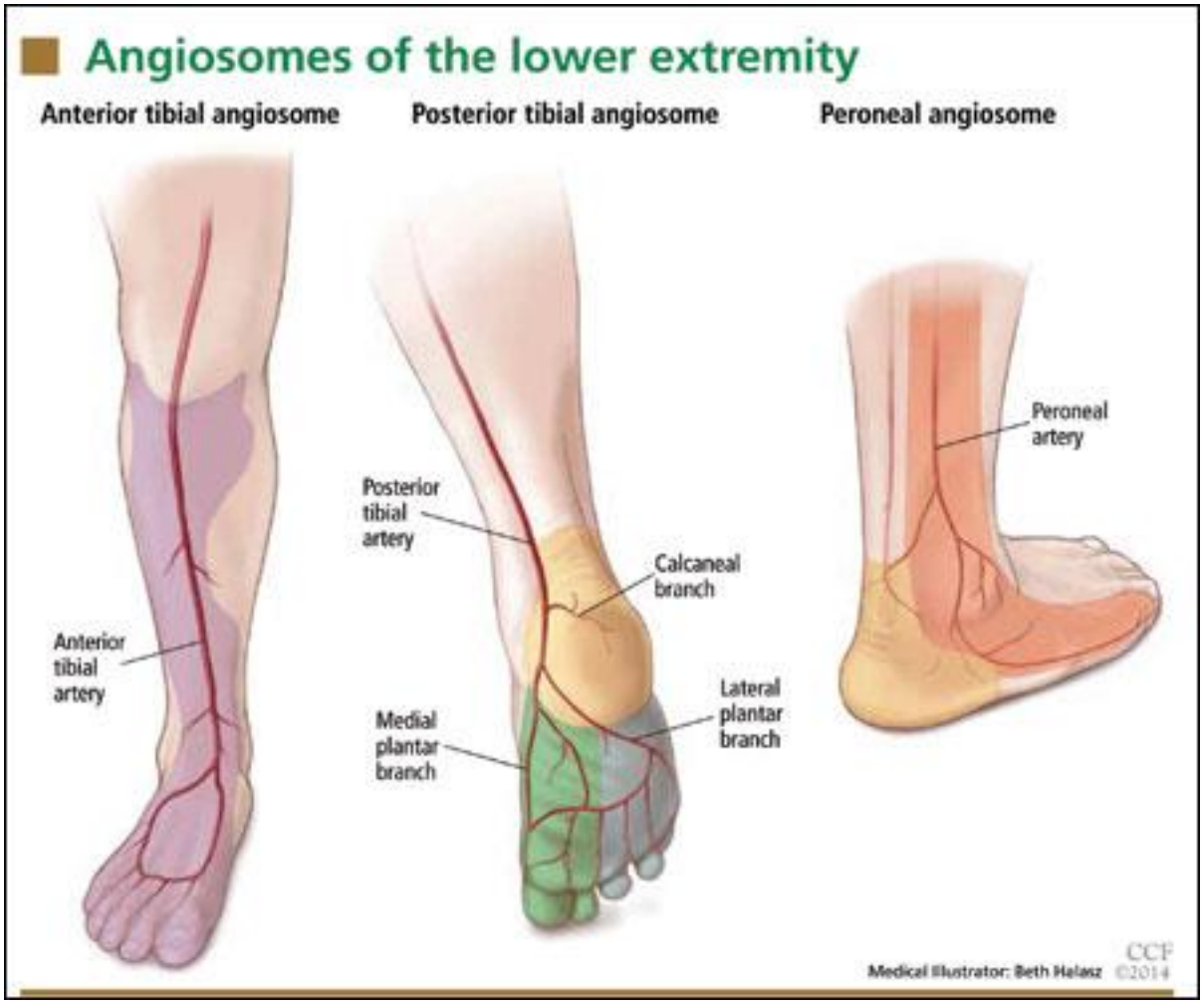
Small Vessel Disease
Microangiopathy
Microvascular dysfunction

- Microvascular dysfunction: arteriovenous shunting, capillary leakage, precapillary sphincter malfunction, venous pooling, hormonal activity in the vessel, and inflammation in the vessel wall.
- An obstructive arteriolar process that was once thought to preclude successful revascularization in diabetic pt's. No longer true!

Similar to renal arteries, which do not communicate with each other within the kidney, I like to think of the severely ischemic diabetic foot as having somewhat functionally end arteries.


1
2
3
A
1
2
3
B
3
C
1
2
3
D
2
3
4
E

Angiosomes of the lower extremity



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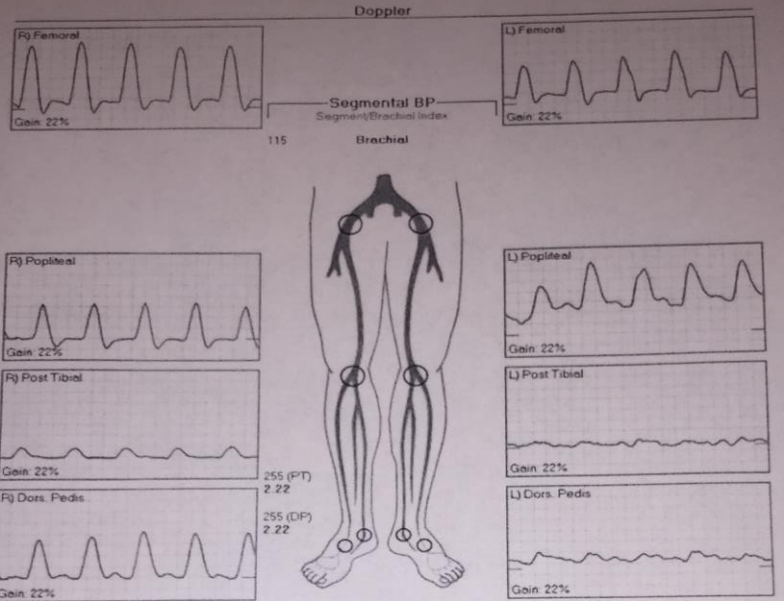
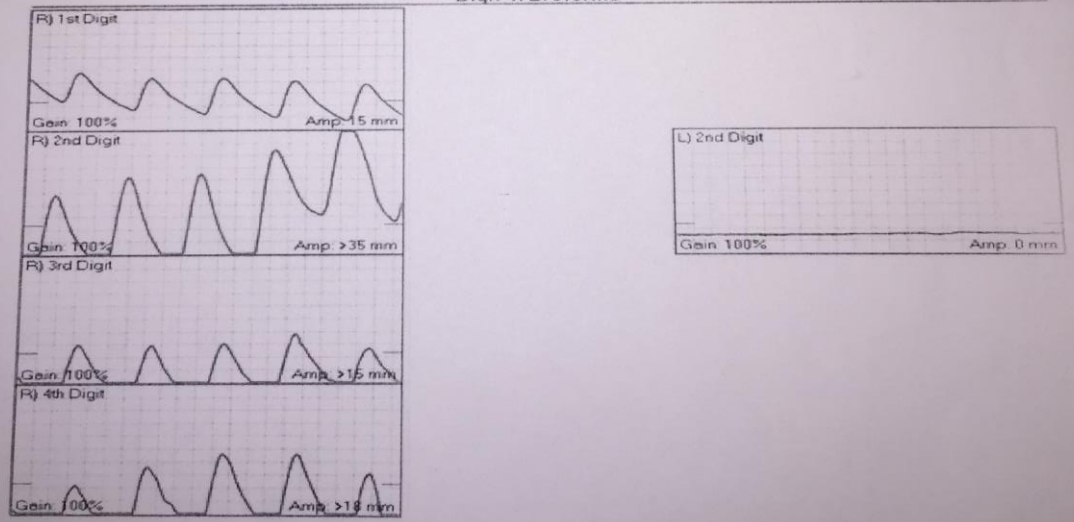
Doppler

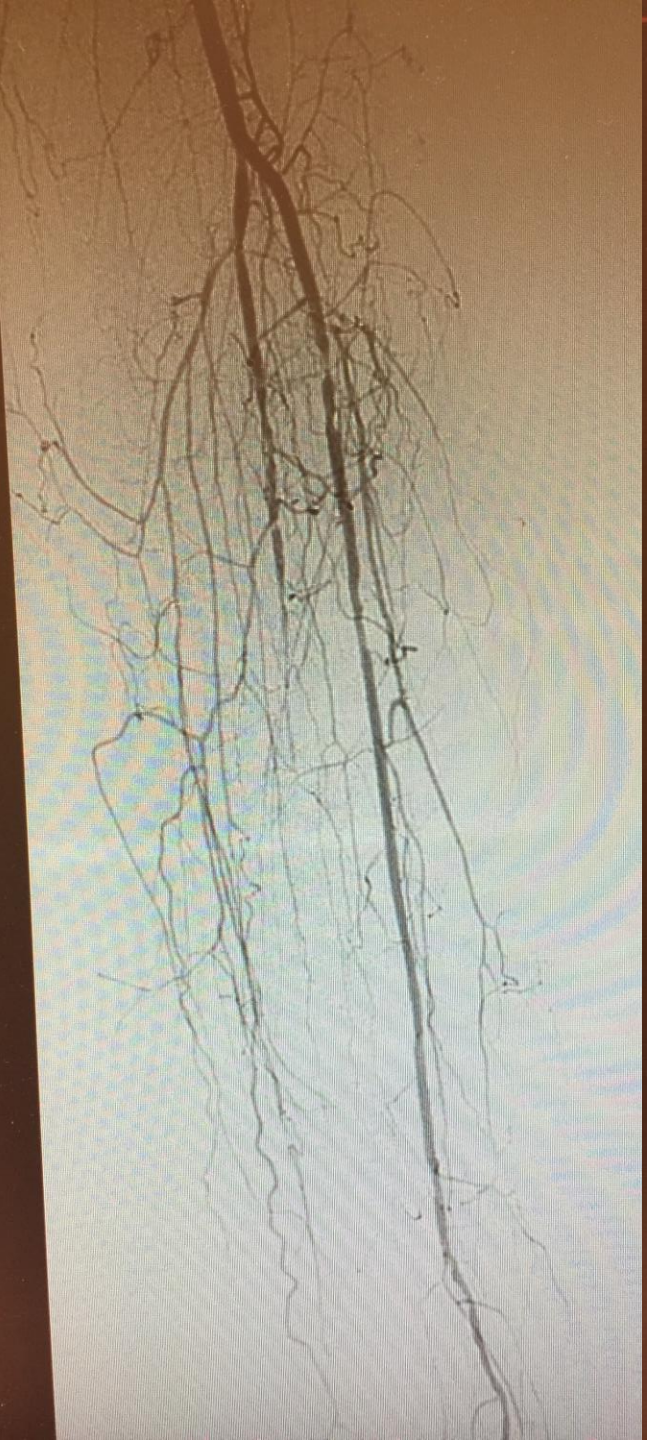


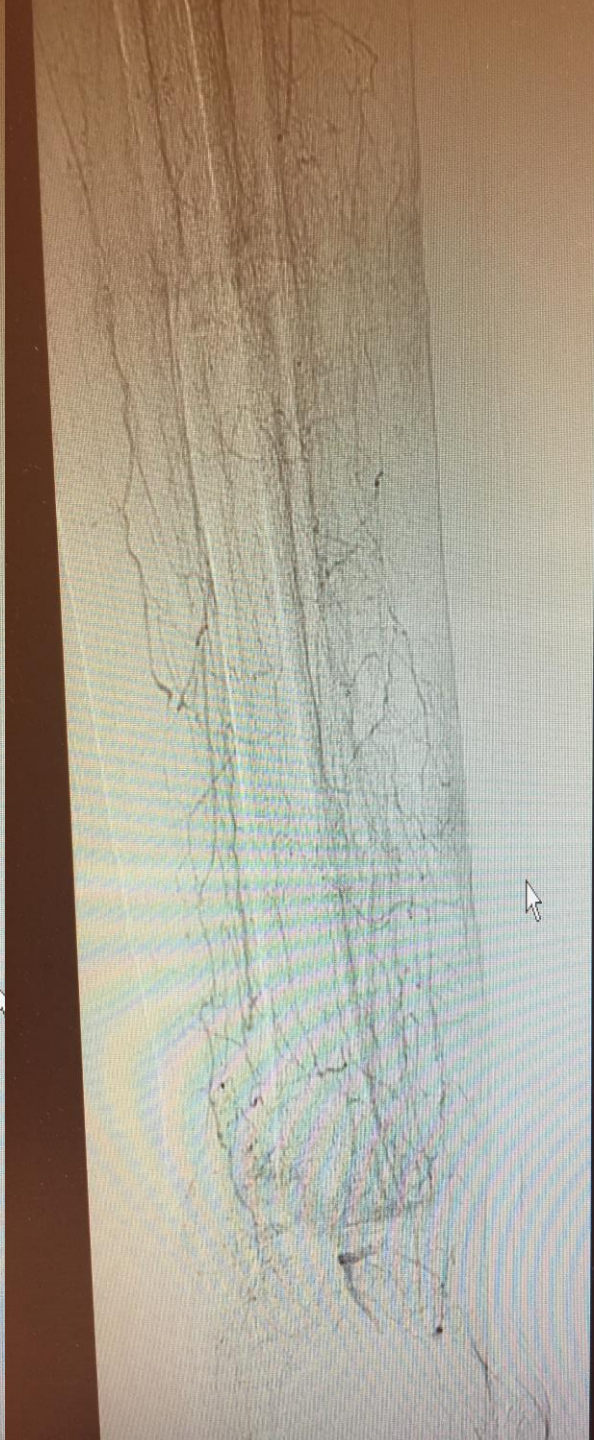
2.22 **Ankle/Brachial Index**

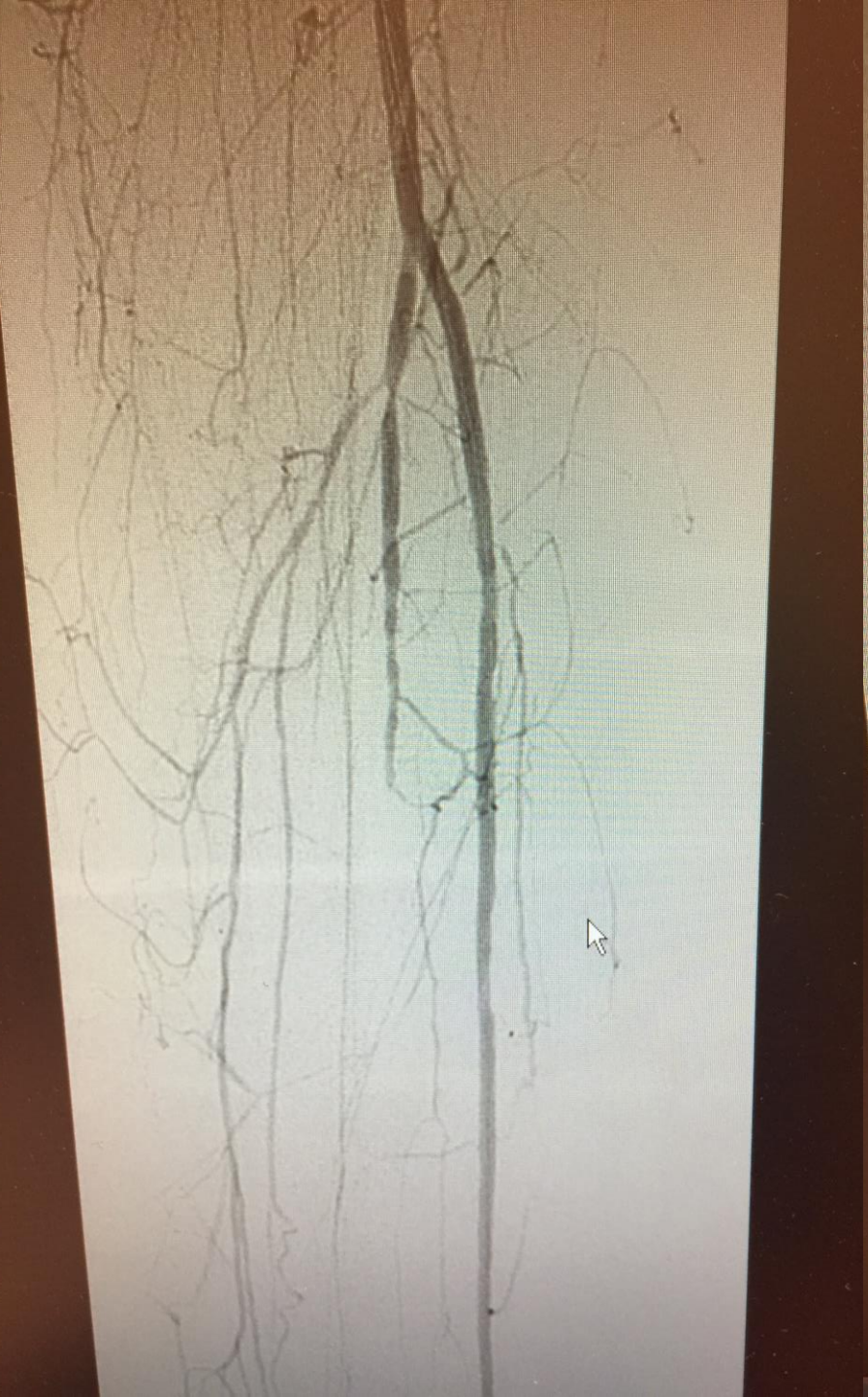
Digit Waveforms

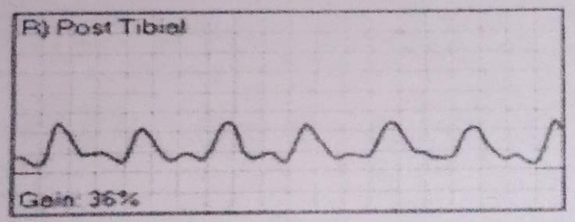


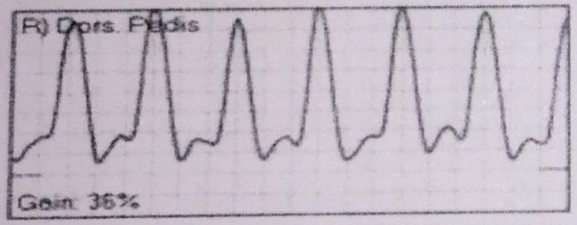
Amputation - right 5th, left 1st & 4th
Oozing left 2nd & 5th

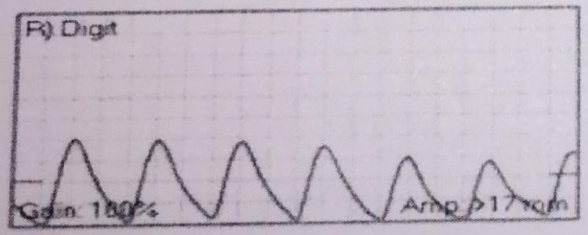








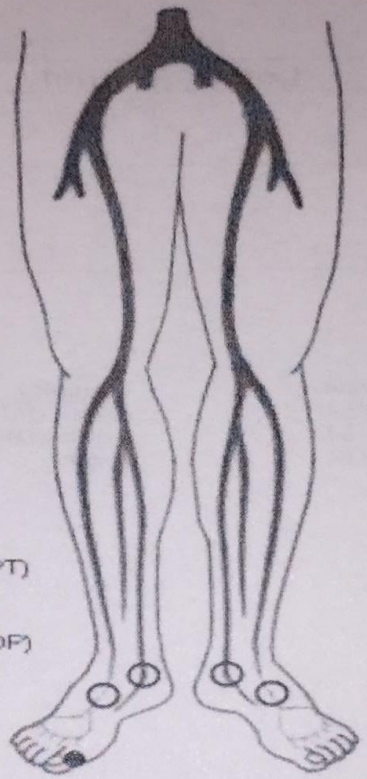


255 (PT)
1.54

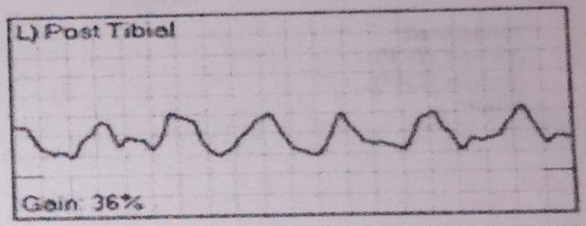
255 (DP)
1.54

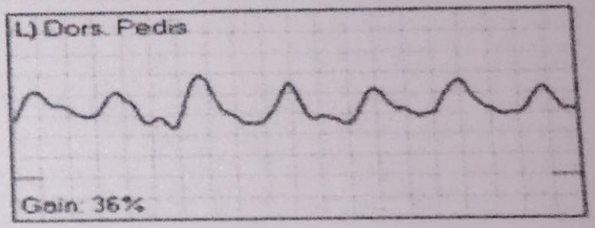
139
0.84

1.54



Ankle/Brachial Index





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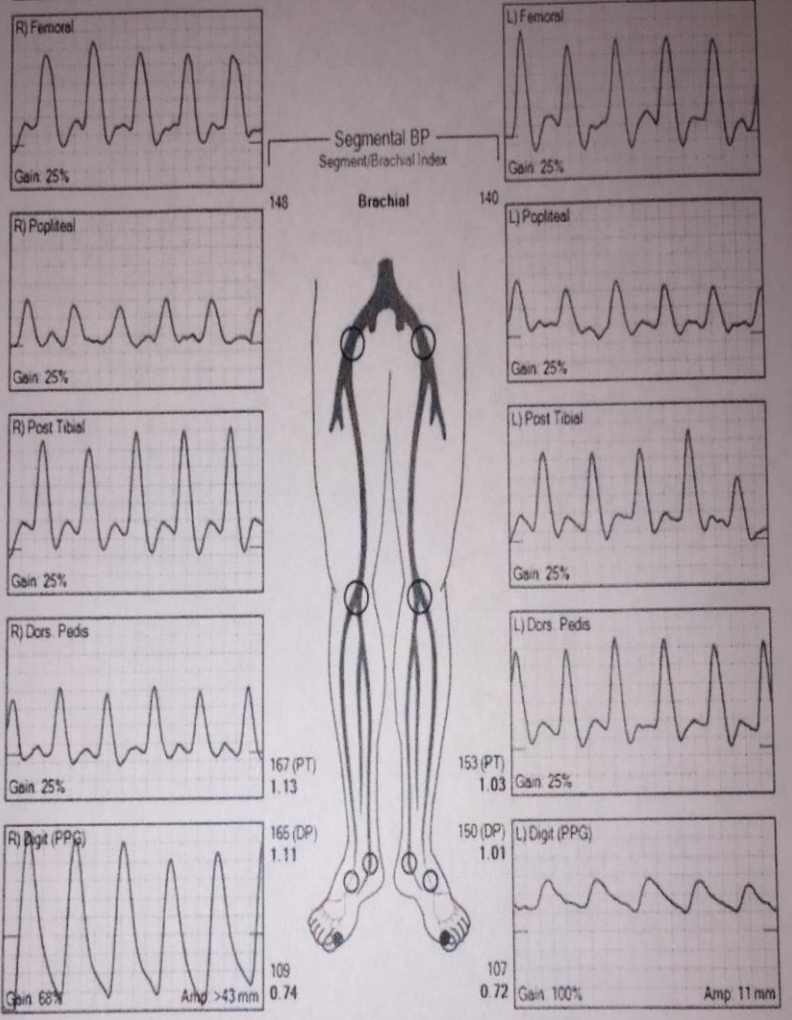

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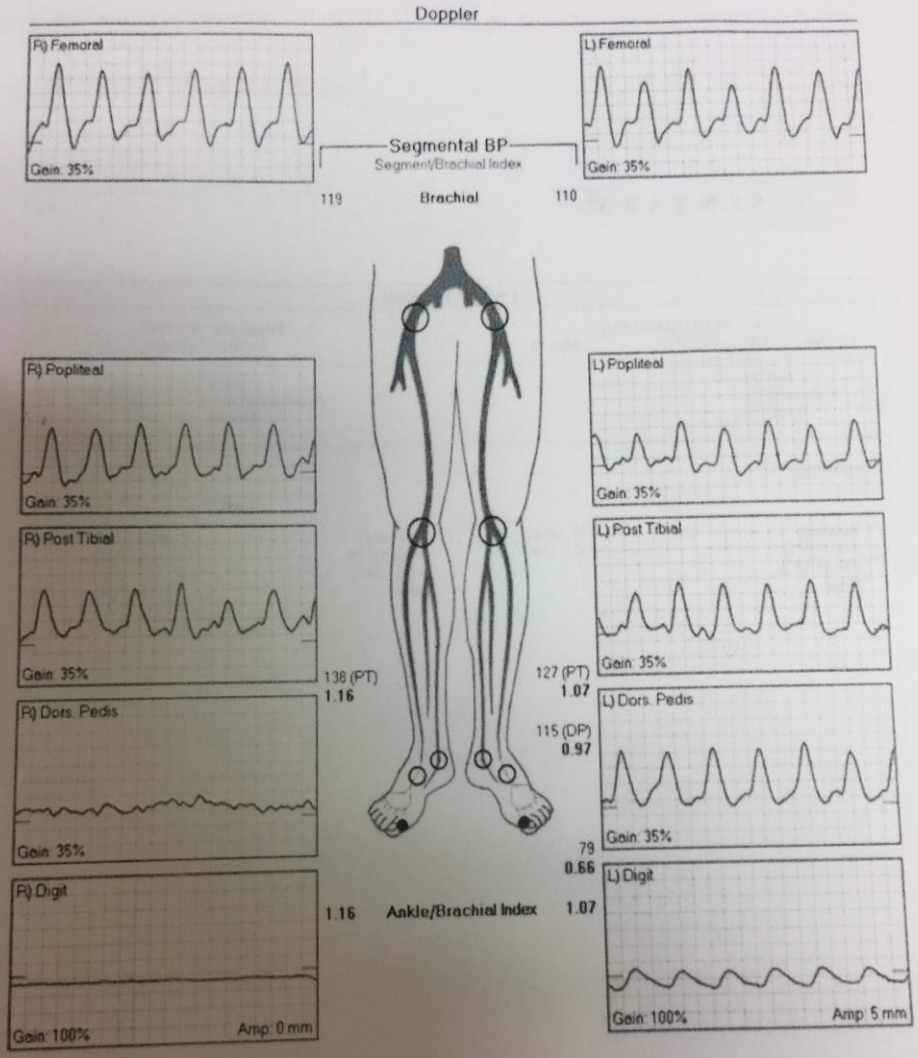

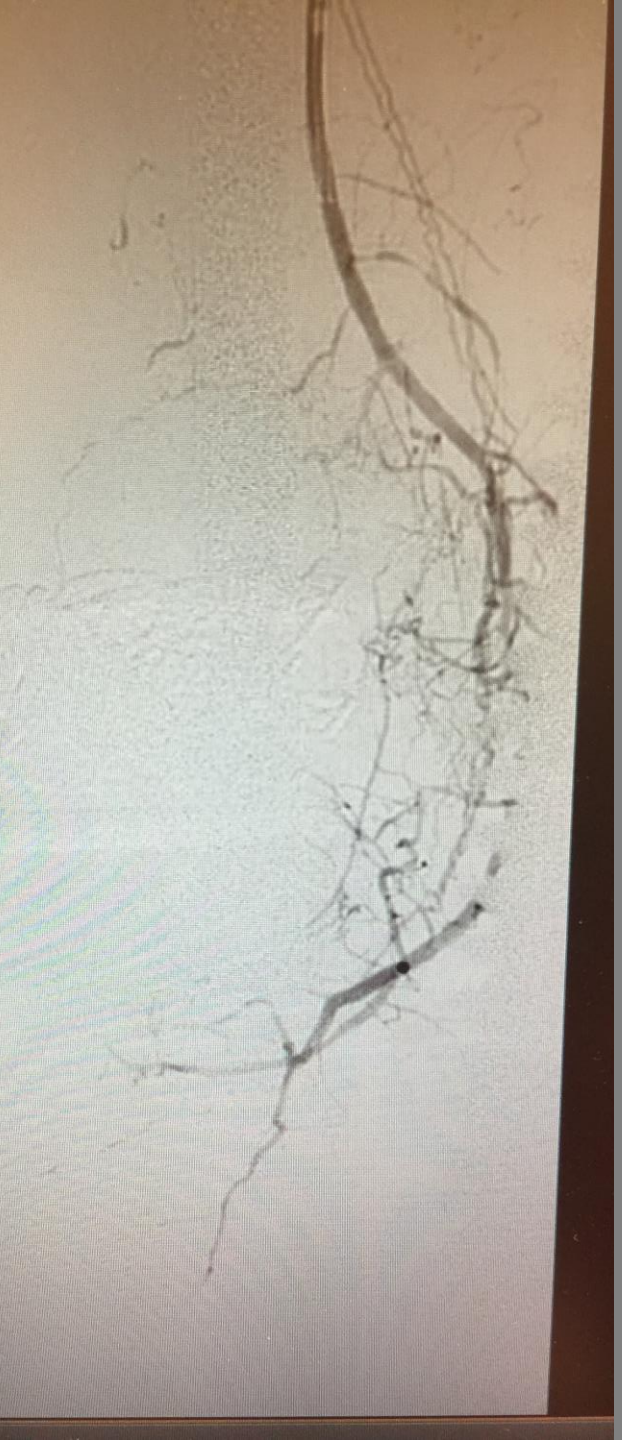

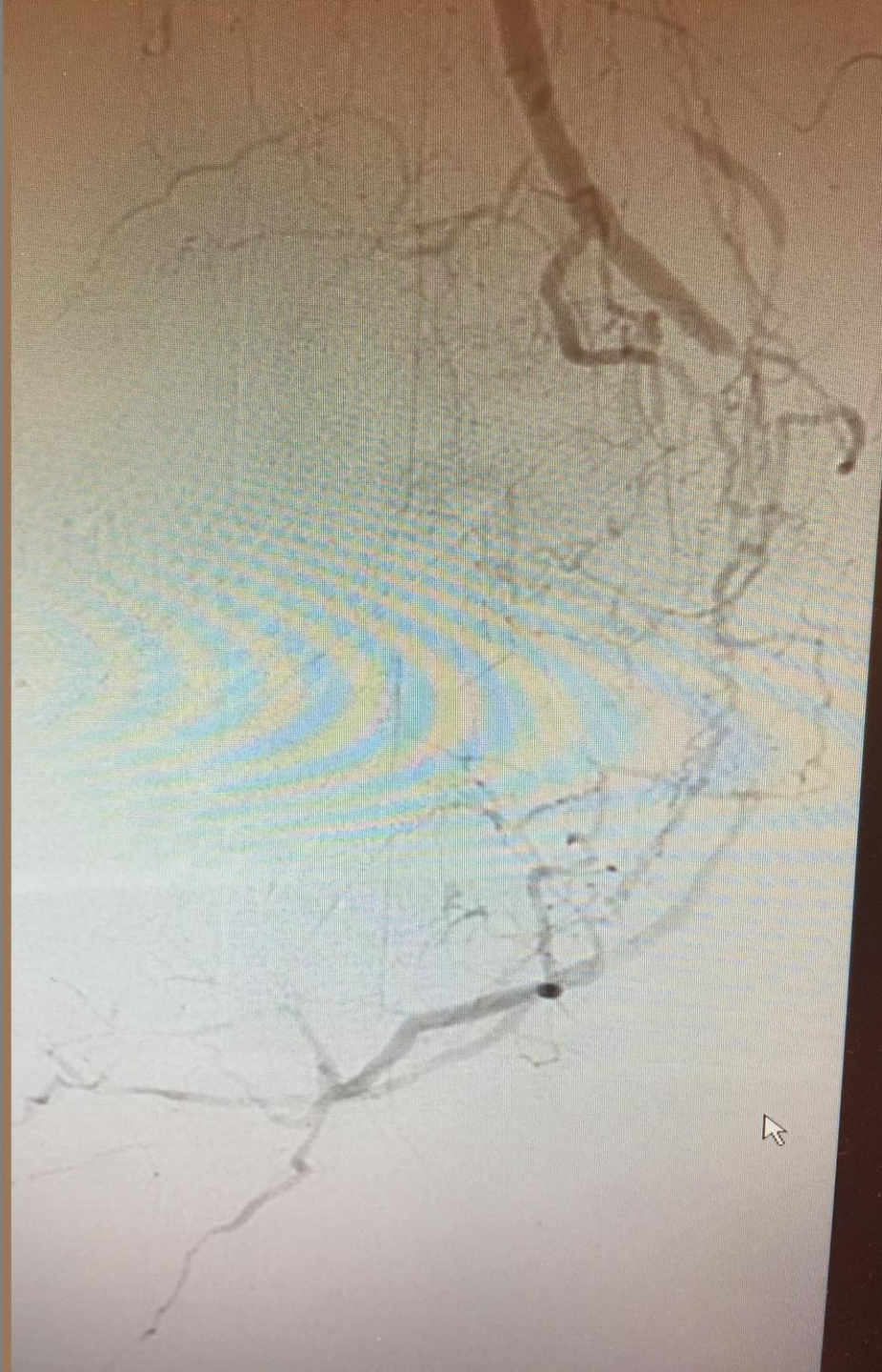

Why bpg instead of endovascular?

Vein Bypass Patency rates

- Ak fem pop 5yr 75% primary
- Bk fem pop 5yr 70% primary, 4yr secondary 81%
- Tibial bpg 5yr 65% primary, 4yr secondary 76%
- Ankle or below bpg 1yr 81%, 3yr secondary 72-76%

BASIL trial
Bypass vs Angioplasty in Severe Ischemia

- Pt's who lived more than 2yrs after randomization, a bypass first revasc strategy was associated with a significant increase in overall survival as well as a trend toward improved amputation-free survival.
- Vein grafts clearly better results than prosthetic.

BASIL trial

- Patients with severe limb ischemia and long-segment atherosclerotic disease who have useable vein, lack severe comorbidities, and have a life expectancy of at least 2yrs are likely to be best served with an open surgical approach first with autologous vein.

Down sides for BPG, Complications
Prevent III trial data
(1400 infrainguinal vein grafts in pts with CLI)

- Death 2.7%
- MI 4.7%
- Major amp 1.8%
- Graft occlusion 5.2%
- Major wound comp 4.8%
- Graft hemorrhage 0.4%
- Late complications (lymph edema, graft infection, graft aneurysm, graft stenosis)

Graft Surveillance

- Critical to success!
- Abi and duplex scan
  - Obtain baseline at <4 weeks postop, then every 3 months for first yr, every 6 months for two yrs, then annually after.

Conclusion

- Open surgical revascularization techniques will continue to be required in the treatment of CLI despite the improvements in our endovascular skills and tools.
- Diabetic's with CLI require aggressive treatments for limb salvage, best done by those who are willing to work hard, have persistence and truly want good outcomes.

Thank you