This is How I Do It
Retrograde Tibio-Pedal Access

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Disclosures

- Bard Peripheral Vascular - Research, Consultant
- Cardiovascular Systems, Inc. - Research, Consultant
- Cook Medical - Research, Consulting
- Covidien – Consulting
- Terumo – Consulting
- Spectranetics – Research, Consulting

Proximal to mid Tibial runoff
Popleteal (Pop)
Anterior Tibial Artery (ATA)
TibioPeroneal Trunk (TPT)
Peroneal (Pr)
Posterior Tibial Artery (PTA)

Mid to distal Tibial runoff
PTA
PrTA
ATA

Lateral Calcaneal branches
Posterior Tibial Medial calcaneal branches
Lateral plantar
Medial plantar
Dorsalis Pedis

Peroneal lateral Calcaneal branches
DP
Tibial Vessels Evaluation and Access

• Leg Orientation
• Probe Selection
• Utilization of US in delivering therapy
Technique

• Assessing the ideal spot for retrograde tibiopedal arterial access site is mainly done by ultrasound.
• The operator can evaluate the vessels with color and pulse-wave Doppler in multiple planes.
• This is of paramount importance as it decreases the likelihood of venous puncture, venous sheath placement, AV fistulas, and tibial artery spasm.

AMP Group, 2012

Technique

• Arterial spasm decreases the likelihood of success, especially when the vessel lumen is already compromised.
• At our institution we use the Philips linear 15i7 MHz hockey stick probe and the Philips iU22 X-Matrix (Philips Electronics, Andover, MA).

AMP Group, 2012

Technique

• As we move the probe cranially, it is easy to visualize how the tibial veins start to separate from the tibial arteries, allowing easier cannulation of the tibial vessels in a spot where the veins are not located in the planned needle trajectory.
• While moving cranially, it is essential to keep in mind the four major anatomical compartments below the knee.
• These compartments lay within the gastrocnemius muscle and most of the time end at the insertion points of the distal gastrocnemius heads.

Technique

• It is imperative to avoid accessing beyond the gastrocnemius heads in order to decrease the likelihood of a complication resulting in compartment syndrome, which in turn can lead to emergent surgical intervention and in rare occasions even amputation.
• Arterial access below the gastrocnemius heads, allows the operator to have complete control to address potential bleeding complications during and after tibial access procedures.
• A vascular technologist is present during the access process.
Technique

- The short and long access views of these vessels will reveal the access point.
- The operator will monitor the introduction of the access needle.
- Retrograde tibial access will identify a hibernating lumen of these vessels not otherwise identified with traditional angiography due to proximal vessel occlusion.
- Tibial lesions also can be distal and easy to identify on US evaluation.

Angiographic Confirmation

- We then inject contrast to confirm our intraluminal position.
- If the patient blood pressure allows, we inject 300-400 micrograms of nitroglycerin into the tibial vessel.
- Depending on the operator, usually a 4 French micro sheath will be inserted into the tibial vessel.

Anterior Tibial Artery Access

- The tibial vessels are accessed in the following fashion:
- Typically the foot is prepped and draped separately.
- The orientation of the foot is adjusted depending on the target tibial vessel.
Anterior Tibial Artery Access

- In cases of the dorsalis pedis (DP) or the distal anterior tibial artery (AT), the foot is maintained in natural orientation with the heel of the foot on the mattress with slight dorsiflexion.

Posterior/Peroneal Tibial Artery Access

- To access the posterior tibial artery (PT) the foot is rotated laterally and the leg will be bent slightly at the knee level for patient comfort.
- To access the peroneal artery the foot needs to be rotated laterally further to separate the fibula and tibia. This maneuver will facilitate direct cannulation of the artery.
The Operator will choose a lower frequency Probe to image the tibial vessels as they dive into the major Compartments.

Ultrasound Guided Tibial-Pedal access procedure
The science of tibial access

60-70 Degrees

J.A. Mustapha, MD
Needles

- Needles are reflective of US waves
- It is essential to visualize the needle during puncture of the artery

Saab et al.
Figure X: the best ultrasound guided entry points into the tibial artery
- 12 O’clock is the best entry point into the tibial artery
- 1 and 11 O’clock are the 2nd best entry points into the tibial artery
- 2 and 10 O’clock are the 3rd best entry points into the tibial artery
Extra Vascular Ultrasound (EVUS)

- The process of using US to obtain, guide and deliver therapy

TAMI Technique: Tibiopedal Arterial Minimally Invasive Retrograde Revascularization

A novel approach to revascularization in patients with critical limb ischemia.

By J.A. Mustapha, MD, FACC, FSCAI; Fadi Saab, MD, FACC, FASE; Theresa McGoff, RN; and Carmen Heaney, RN

Catheterization and Cardiovascular Interventions

Original Studies

Tibi-Pedal Arterial Minimally Invasive retrograde revascularization in patients with advanced peripheral vascular disease. The TAMI technique, original case series.

J.A. Mustapha MD, Fadi Saab MD, Theresa McGoff BSN, Carmen Heaney BSN, Larry Diaz-Sandoval MD, Matthew Sevensma DO, Barbara Kerenko DO

DOI: 10.1002/cct.25227

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Wires

Reverberation artifacts appear as multiple equally spaced lines

Why is this better than contrast??

No Contrast Yet

Advantage of US
Catheters

Double braided catheter allows for excellent visualization

Popliteal cross sectional view

Popliteal longitudinal view

Longitudinal view of the “white stop sign”

Short access view of the “white stop sign”
Our Experience

- The Tibio-Pedal Arterial Minimally Invasive Retrograde Revascularization Technique (TAMI Technique) has been established at our institution since 2011
- Extra vascular ultrasound in the cath lab (EVUS) has been established at our institution since 2011

Flouro Time with TAMI and EVUS

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Thank You
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