THE DOPPLER

WANDERLUST

FINDING A WAY TO VENOUS DOPPLER

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Learning Objectives

Know
The lower limb venous drainage pathway

Define
A numbered steps for approaching venous drainage.

Identify
Normal sonographic anatomy so you can spot abnormalities
The anatomy of venous drainage of lower limb is extremely variable, however there is order in that variability. We arrange the veins in 3 systems:

**Deep:** located deep to the **fascia**

**Superficial:** located within subcutaneous tissue

**Perforating:** They connect superficial to deep system

The most common indication for lower extremities doppler is to evaluate for deep vein thrombosis, so we need a step by step approach to fully scan for the most common signs of failure.

*Case: Sachi Hapugod, rID: 58602*
Usable positions

You will have to position your patient depending on their capabilities, trying to increase blood in lower extremities for a better evaluation, so spin the twister spinner and game on!

1. Start flat in semifowler
2. For popliteal assessment flex the knee.
3. Sit patient if unable to stand up

You can even call your pal to help raise leg in post-op patients.
We have to go step by step searching for system alterations, so take a look at the 3 systems, every time in a specific order:

1. Deep system
   - Femoral Vein
   - Popliteal Vein
   - Tibialis Anterior
   - Tibialis Posterior

2. Superficial system
   - Great saphenous Vein & tributaries
   - Small saphenous Vein & Tributaries

3. Perforating veins
   - Perforators of foot
   - Perforators of ankle
   - Perforators of leg
   - Perforators of knee
   - Perforators of thigh
   - Perforators of gluteal muscles
1. CFV
2. DFA
3. GSV
4. FV
5. FA
6. PV
7. PA
8. ATV
9. PTA
10. PTV

GSV - Great saphenous vein
SSV - Small saphenous vein
CFV - Common femoral vein
CFA - Common femoral artery
DFA - Deep femoral artery
FA - Femoral artery
FV - Femoral vein
PV - Popliteal vein
PA - Popliteal artery
PTV - Posterior tibial vein
PTA - Posterior tibial artery
ATV - Anterior tibial vein
ATA - Anterior tibial artery
TFT - Tibiofibular trunk

Systematic approach
If not sure, follow GSV until it joins CFV
Once in axial, just 90 rotate probe
Femoral artery will split, then femoral vein will split
Follow CFV until it splits in two
Now divide in thirds the FV and inspect them all.
Rotate patient and inspect popliteal fossa

Remember, PV comes above PA
Deep system

Rotate 90° and find TFT
Mnemonic: PTV can be seen where the "Pubis" is, so its medial.
Mnemonic: ATV can be seen where the "Axilla" is, so its lateral.
Superficial system

- Great saphenous Vein & tributaries:
  - Accessory saphenous
  - Anterior femoral cutaneous
  - Superficial epigastric
  - Superficial circumflex iliac
  - Superficial external pudendal

- Small saphenous Vein & tributaries:
  - Lateral marginal vein of foot
  - Veins of medial aspect of ankle

Perforating veins

- Perforators of gluteal muscles
- Perforators of thigh
- Perforators of knee
- Perforators of leg
- Perforators of ankle
- Perforators of foot

Historically we used eponyms for the same veins:

- Hunter (thigh)
- Dodd's (inferior 1/3 of thigh --> above the knee)
- Boyd's (below the knee)
- Cockett's (calf & inferior 2/3 of leg)
You're almost there, find that cleopatra and follow it all the way up
Sweep to the medial region of the leg and ID veins that perforate the deep fascia.
You made it! NOW MASTER IT

JUST BEWARE OF THE DETOURS...
Signs of Thrombosis

- No color on doppler
- Non compressible segment
- No flow with calf compression
- Increased flow in superficial veins
- Loss of phasic flow

Case: Najera J, rID: 26439
**Signs of Thrombosis**

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Chronic vs Acute

**Acute**
- Increased venous diameter
- Soft/deformable intraluminal material
- Smooth surface
- Free floating edge (uncommon)

**Chronic**
- Normal/Decreased diameter
- Rigid intraluminal material
- Irregular surface
- Synechiae / Calcifications
"IT IS NOT THE DESTINATION WHERE YOU END UP BUT THE MISHAPS AND MEMORIES YOU CREATE ALONG THE WAY."

- Penelope Riley

ENJOY EVERY TRIP...
References