

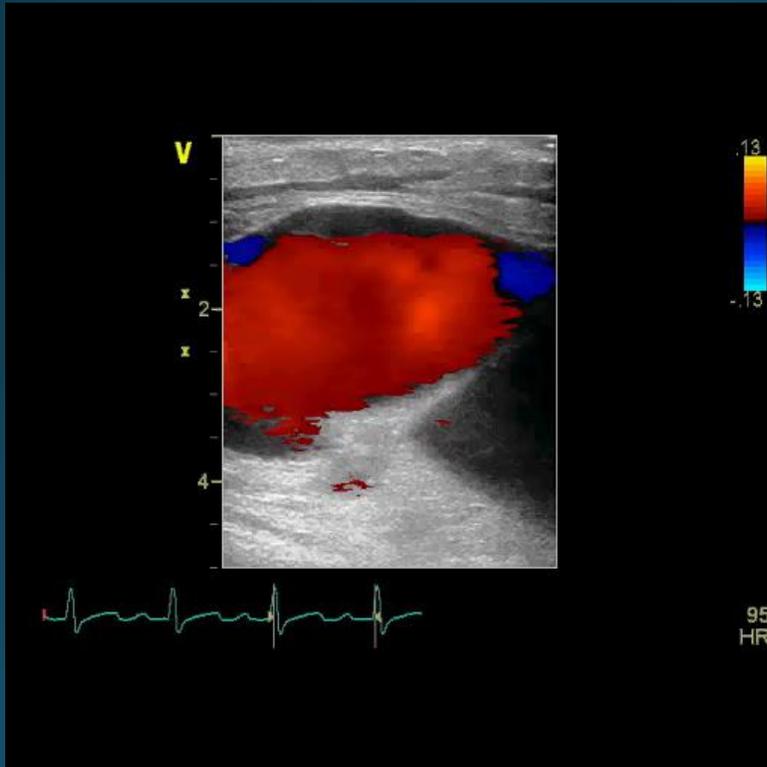
How to set up **ultrasound-guided** vascular access in your cath lab

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Myongji Hospital Cardiovascular Center

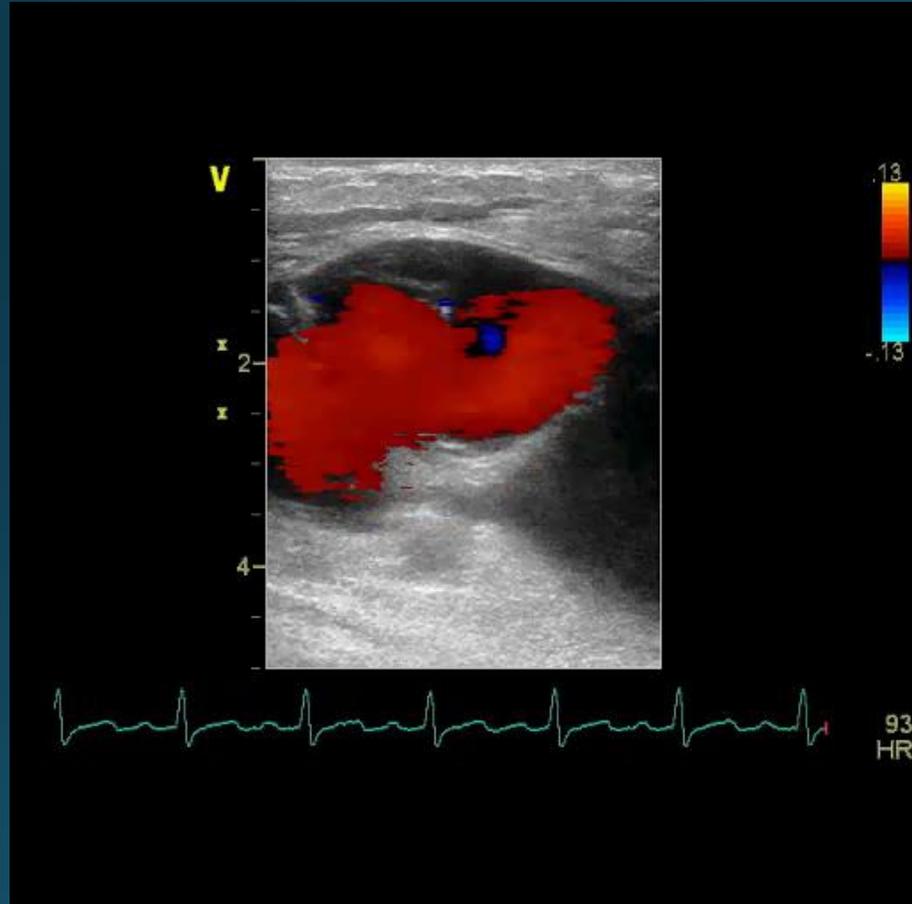
Vascular Access Complication

Femoral Pseudoaneurysm

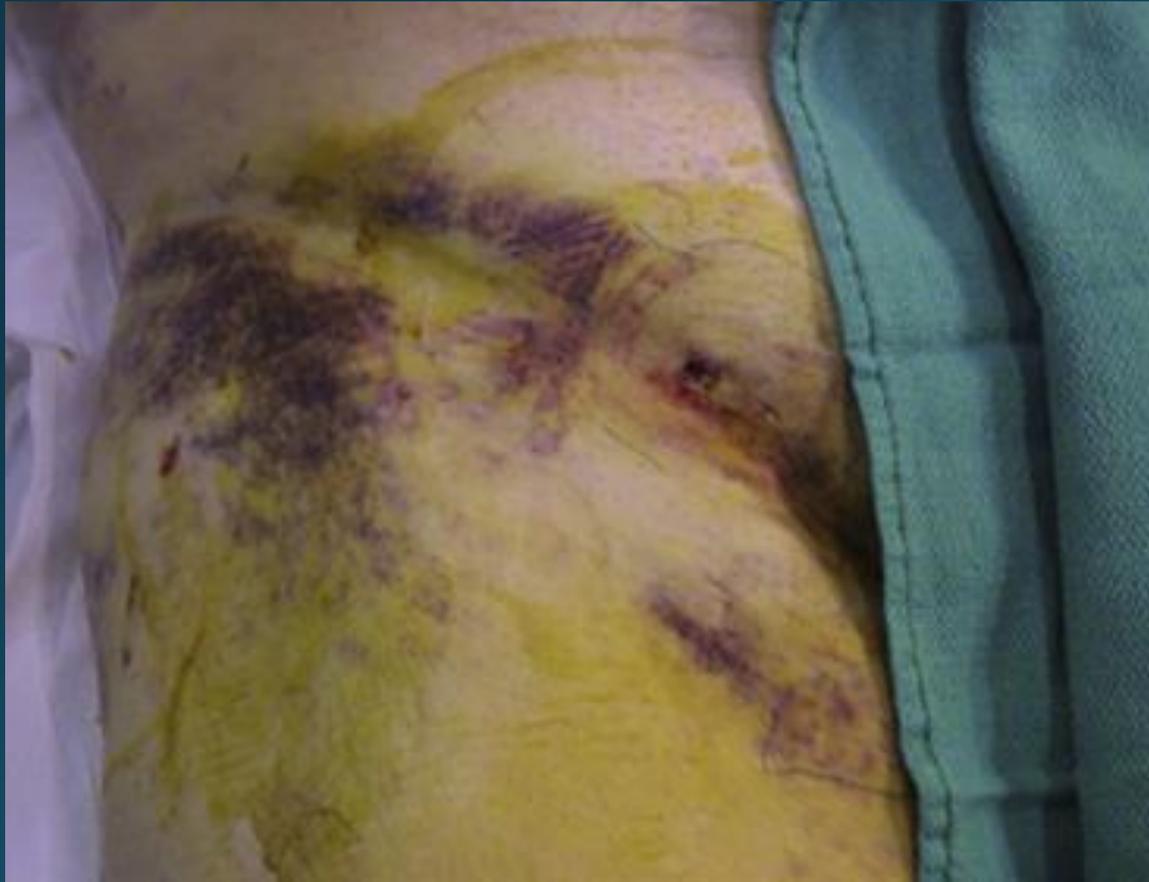


- Vascular closure device
- Transfemoral -> Transradial
- US-guided thrombin injection
- **Blind -> Ultrasound**

US-guided thrombin injection

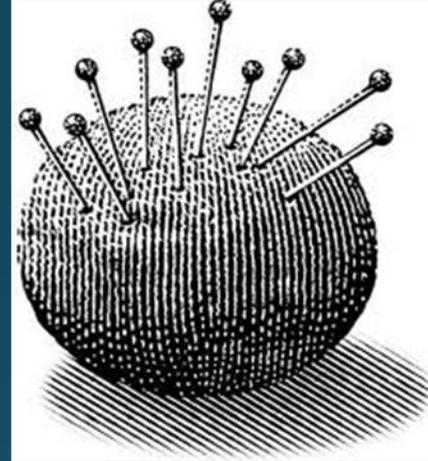


Femoral -> Radial

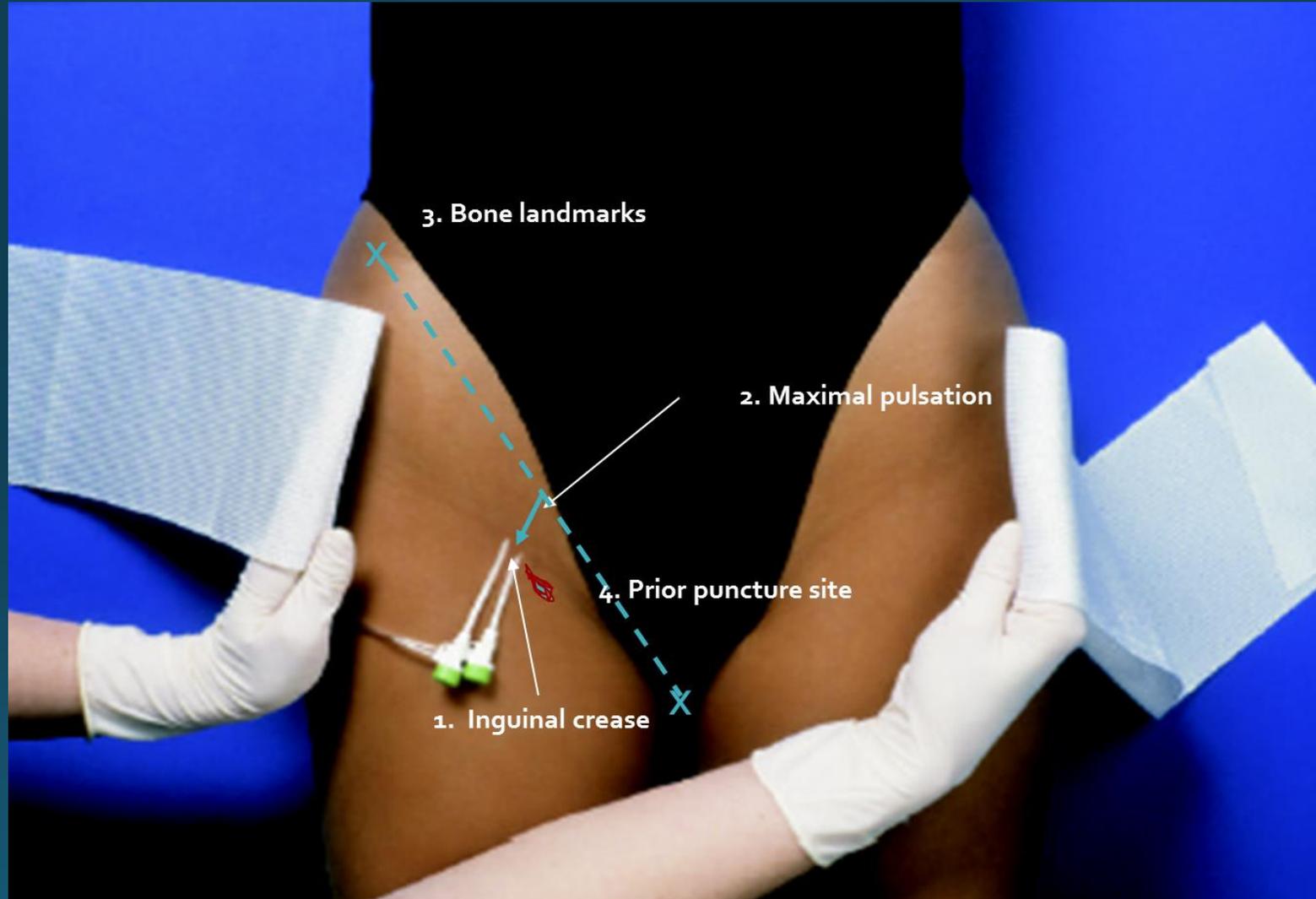


Blind Approach

- Keep poking until you get a gusher



Landmarks for Femoral Access

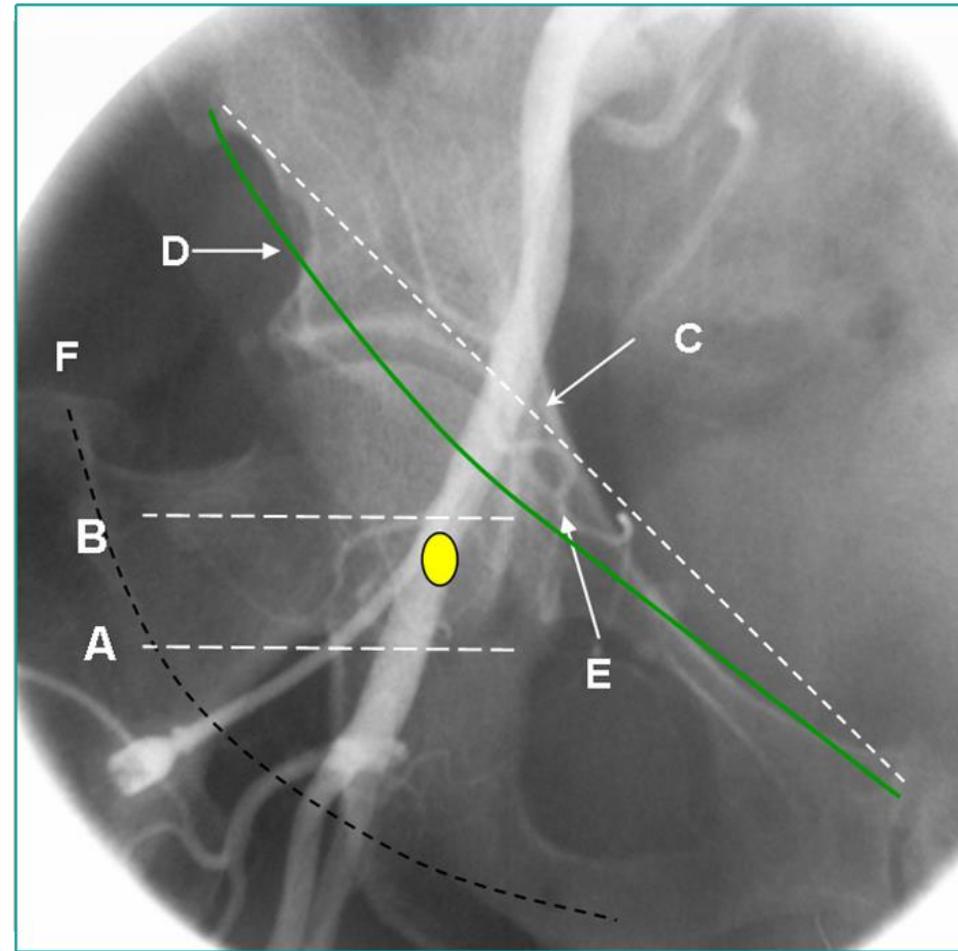
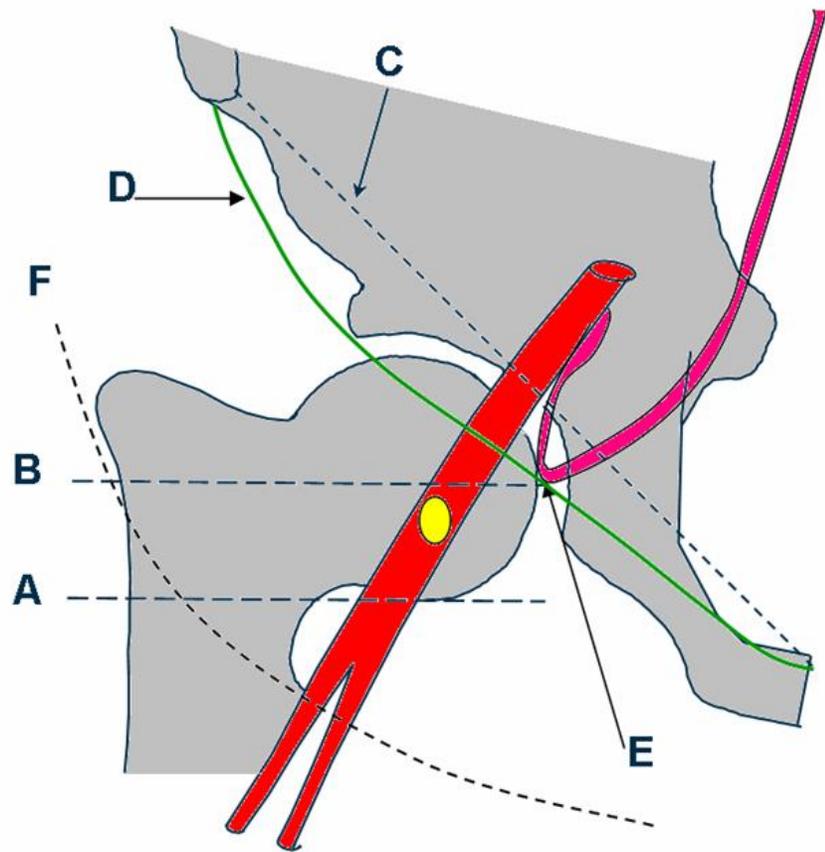


Ideal



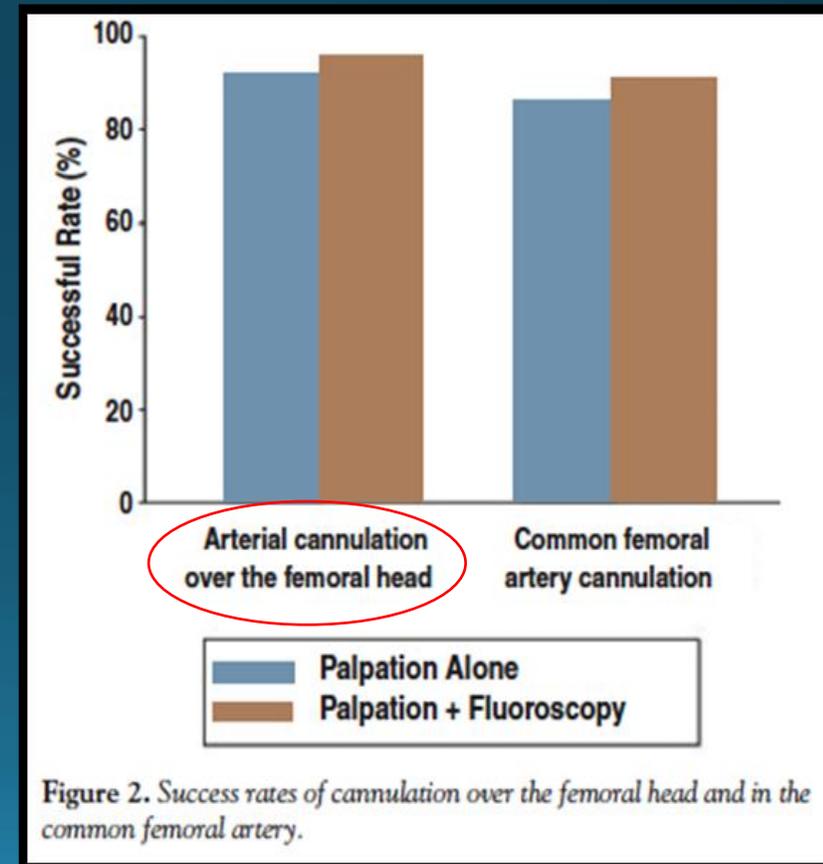
Real



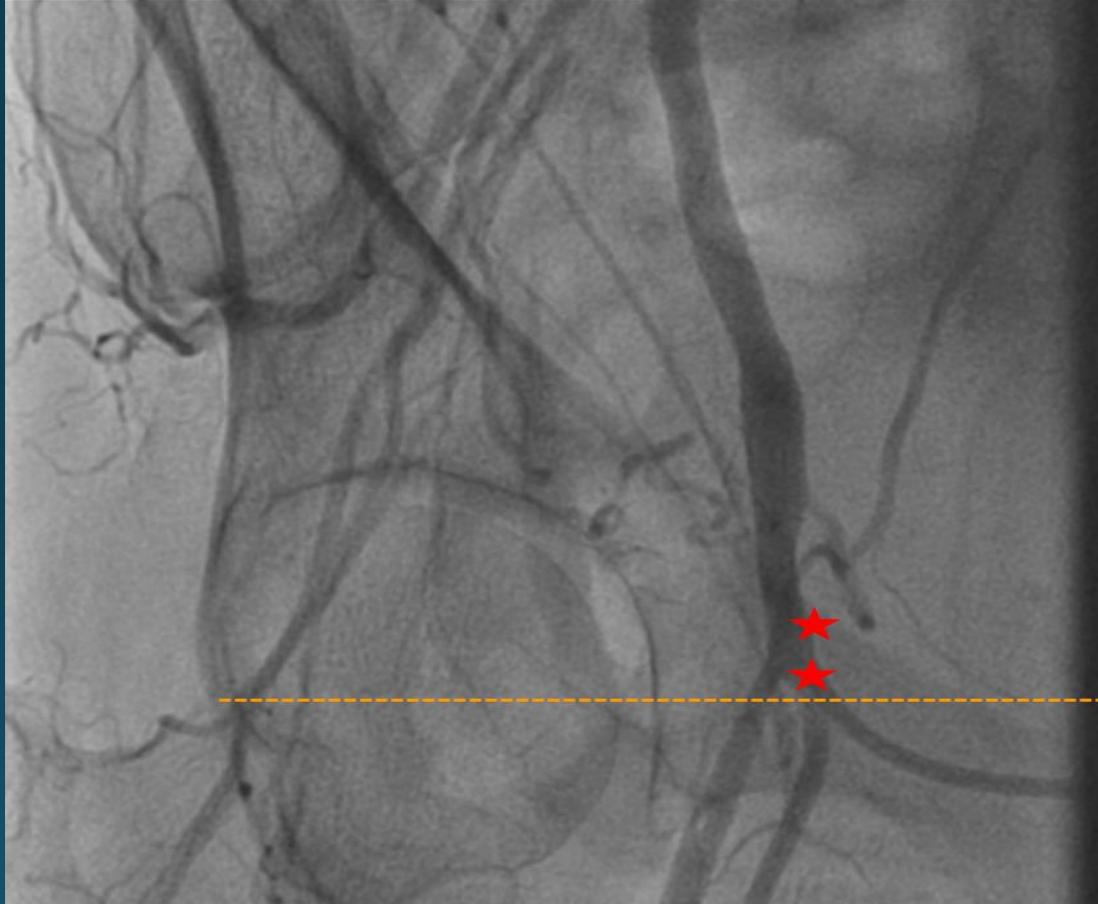


Fluoroscopic guidance – the elusive CFA

- Widely recommended, but 3 RCTs negative
- Huggins CE - J Inv Cardiology 2009
- Jacobi JA - Proc (Bayl Univ) 2009
- Abu-Fadel MS - CCI 2009



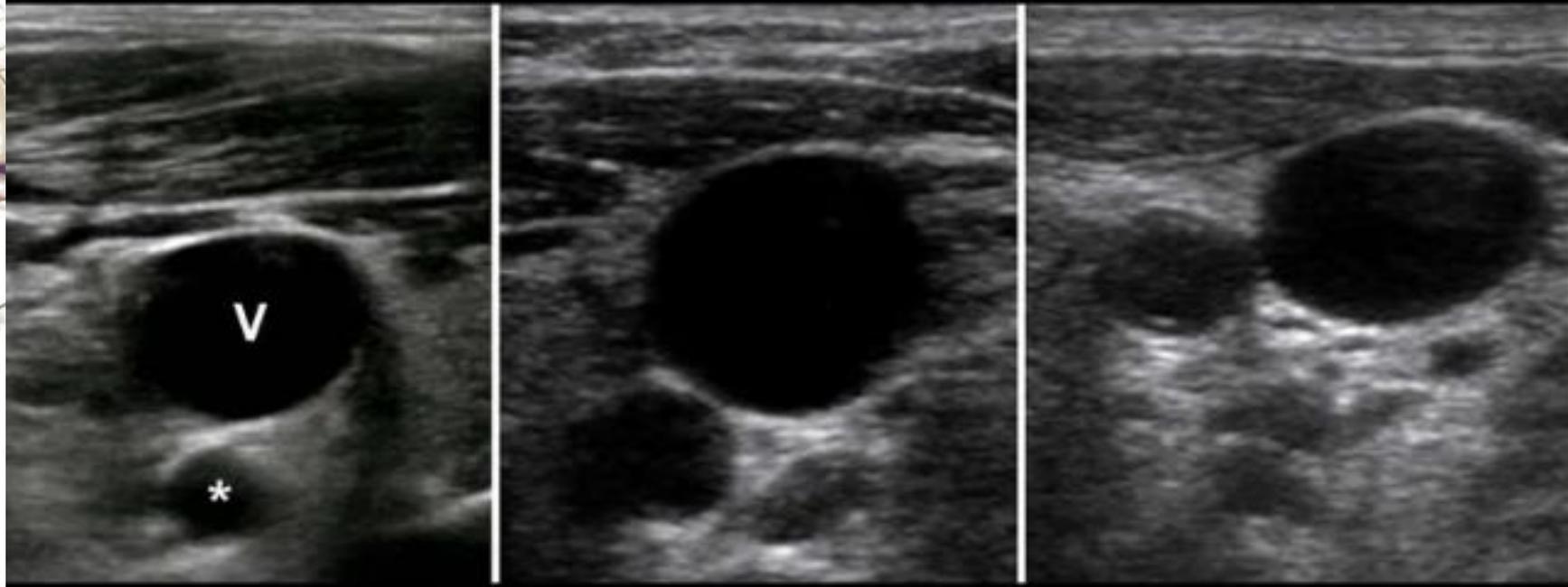
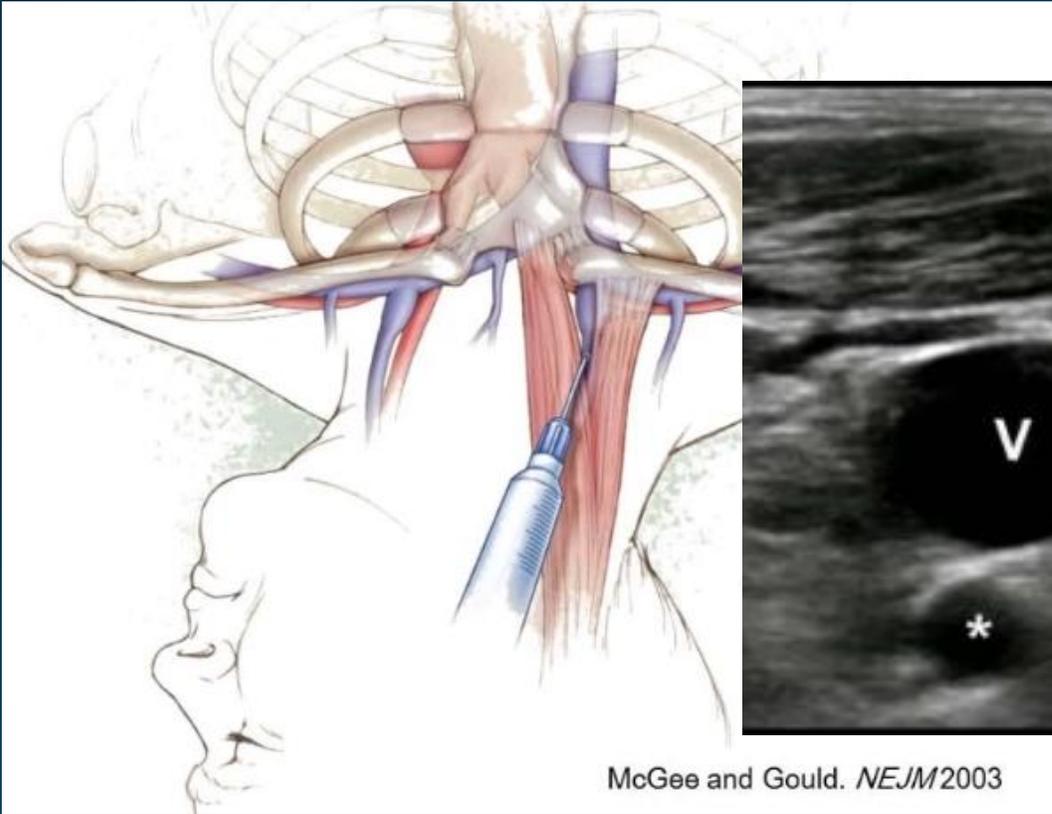
Need to see the Safe Zone! Everyone is unique!



Unpredictable:

Low inguinal ligament
+
High bifurcation

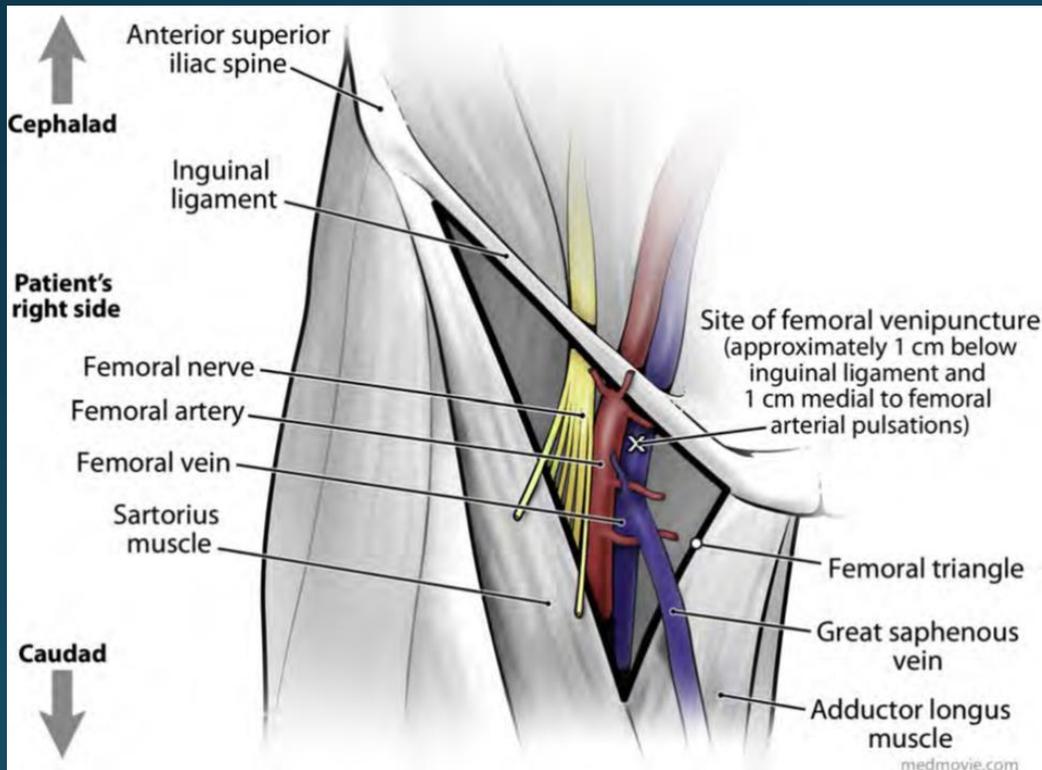
Blind -> US-guided



McGee and Gould. *NEJM* 2003

Blind -> US-guided

We can do well without seeing~!



We can do better with seeing



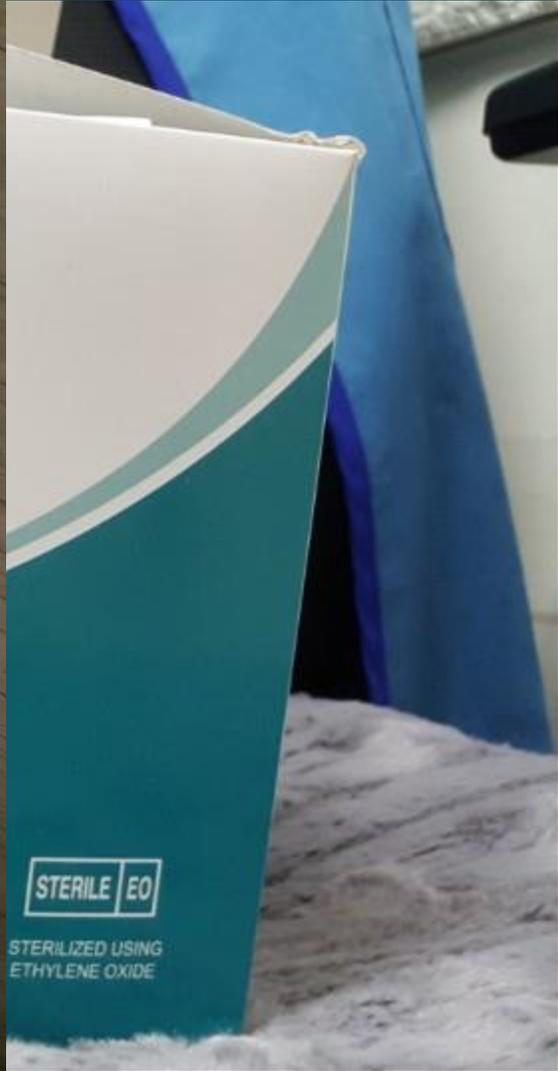
Ultrasound Access Techniques

- “Static”
 - mapping technique
 - no sterile technique required for US
- “Dynamic”
 - views needle entering vein
 - freehand
 - needle guide
 - requires sterile technique



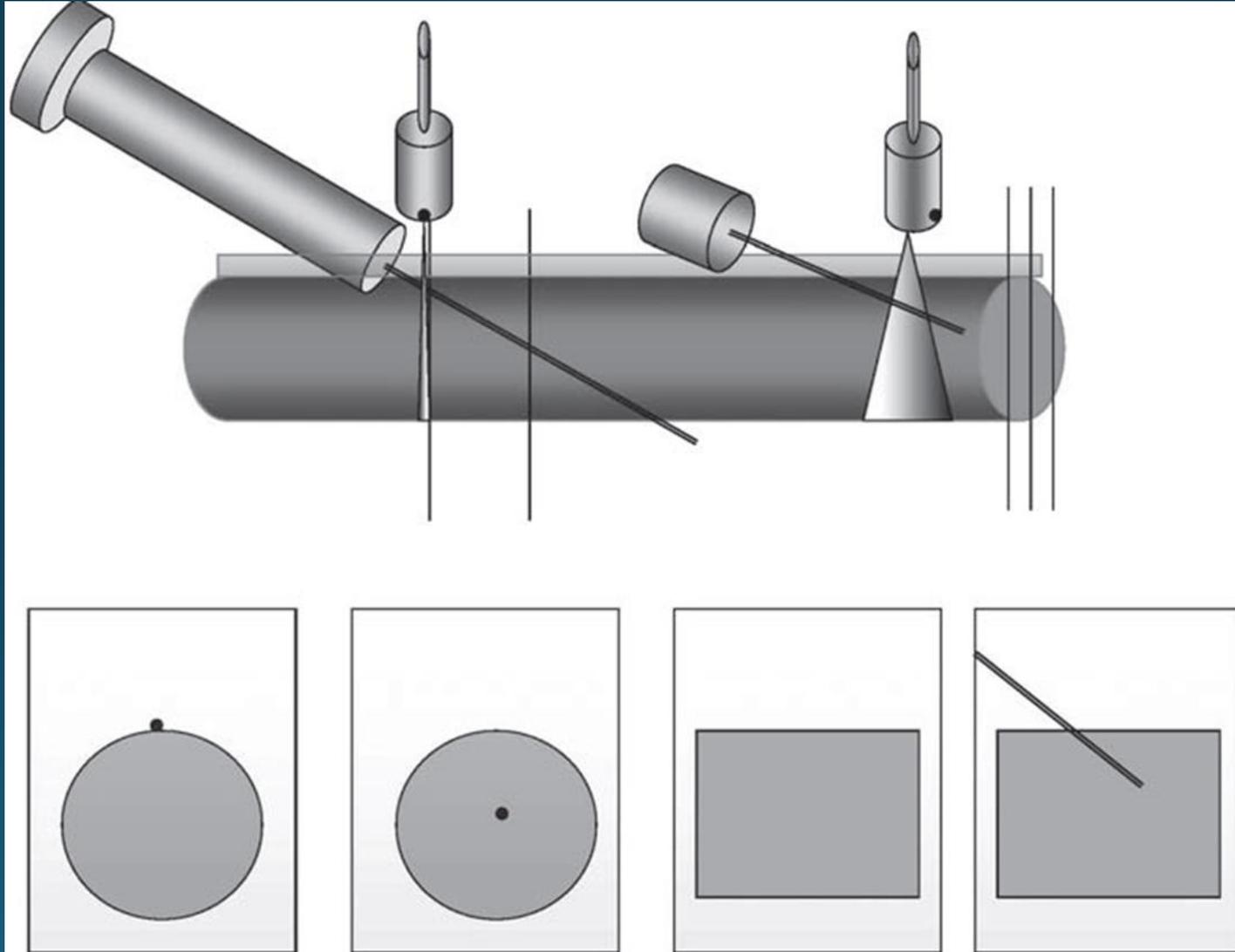
A 15-MHz i7 hockey stick probe





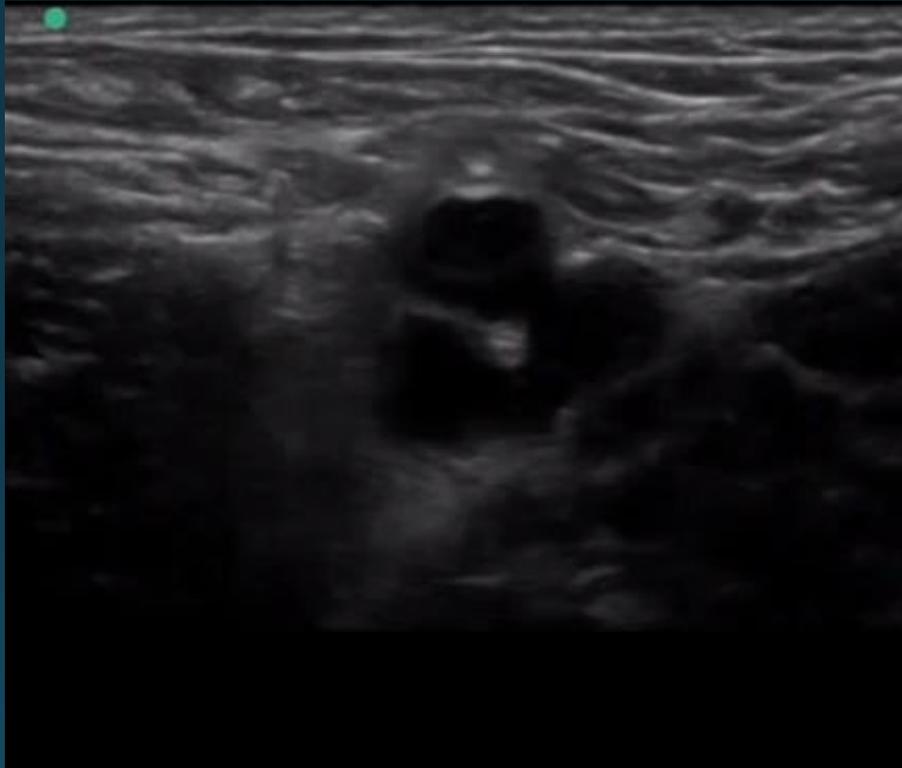


Transverse vs. Longitudinal

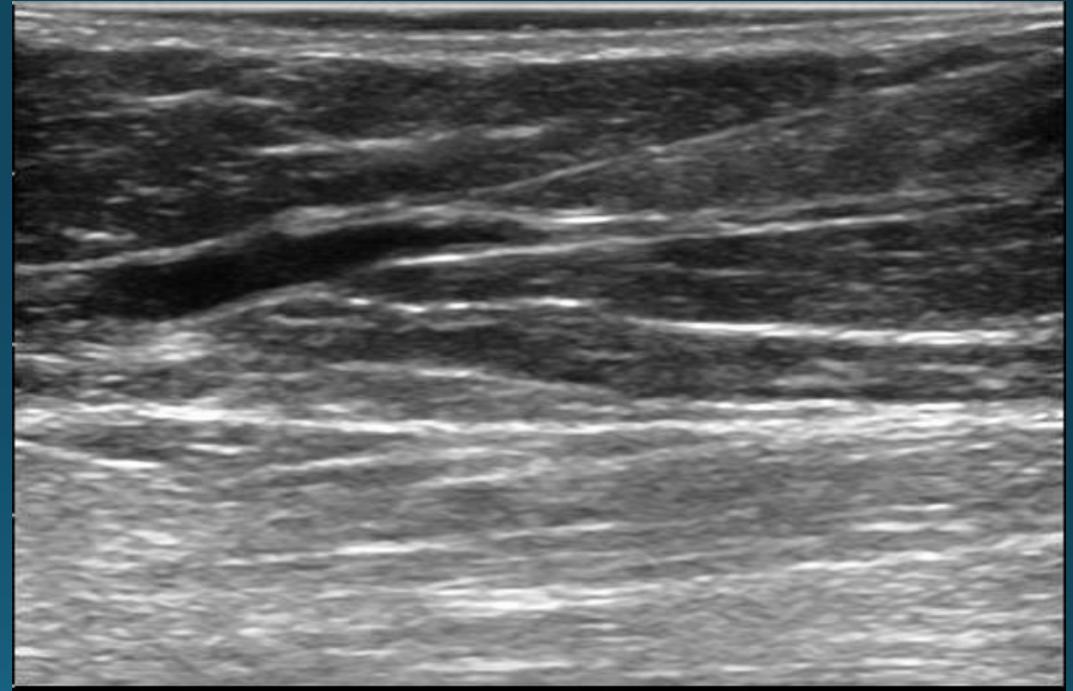




Transverse

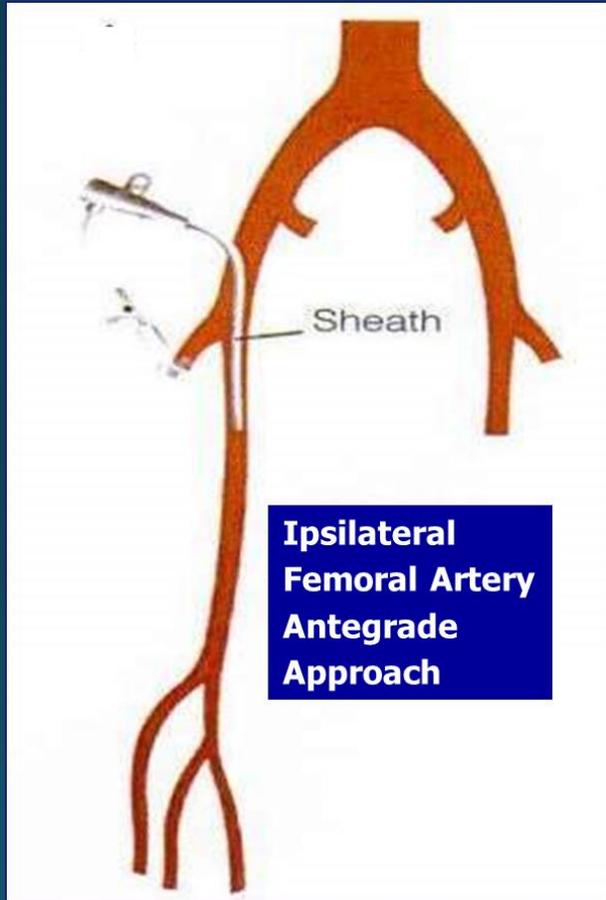


Longitudinal



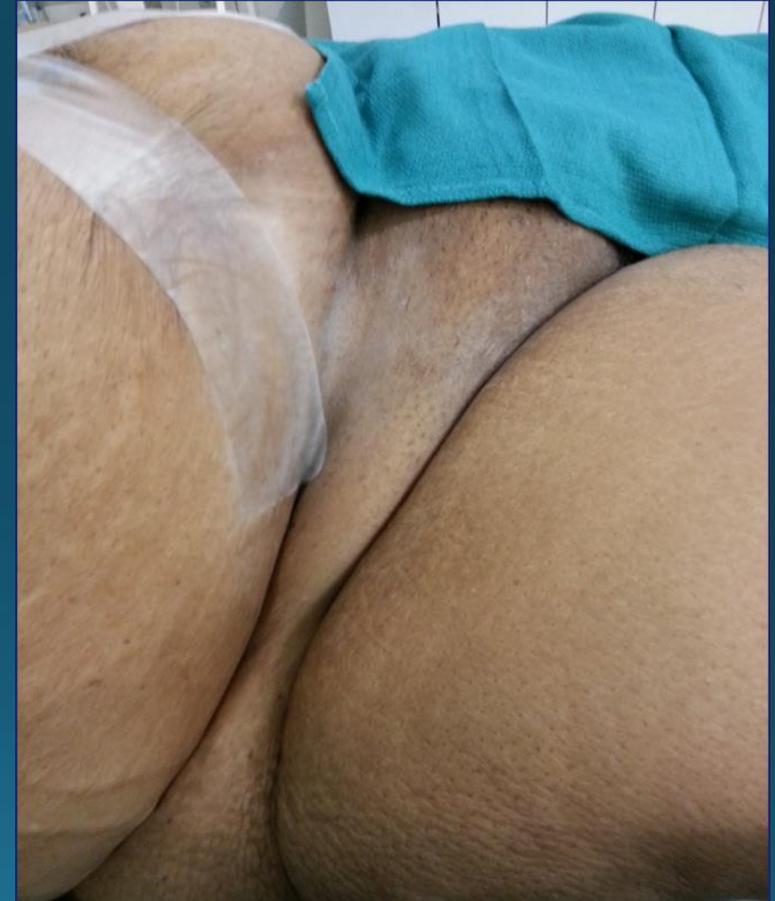
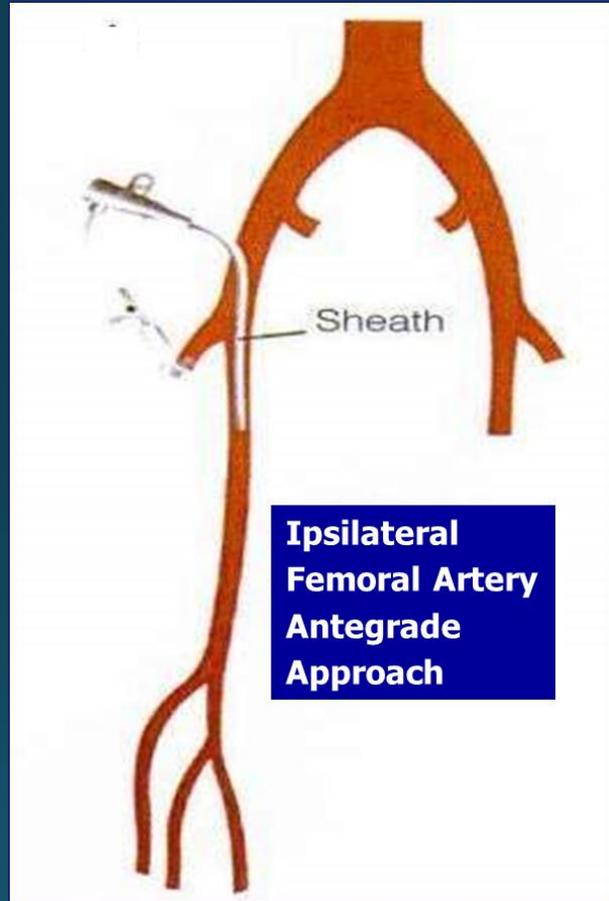
Ultrasound-guided Arterial Access

Ipsilateral Antegrade Femoral Access



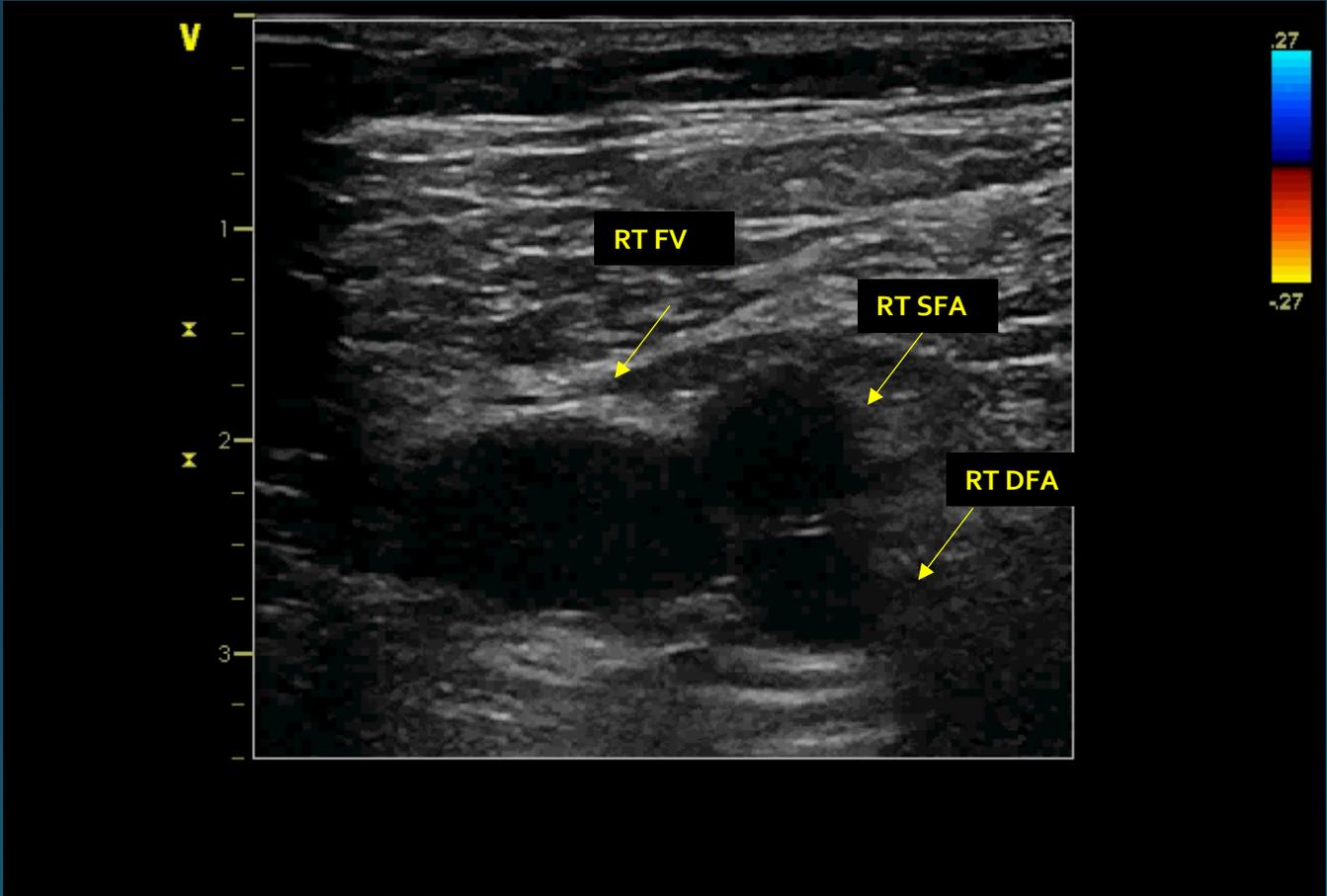
- Advantages:
 - Better 'support' & higher success to cross complex L.E. lesions/CTO
 - Can reach distal pedal lesions
 - Less contrast use
- Novice operator:
 - Learning curve
 - Radiation exposure

Ipsilateral Antegrade Femoral Access





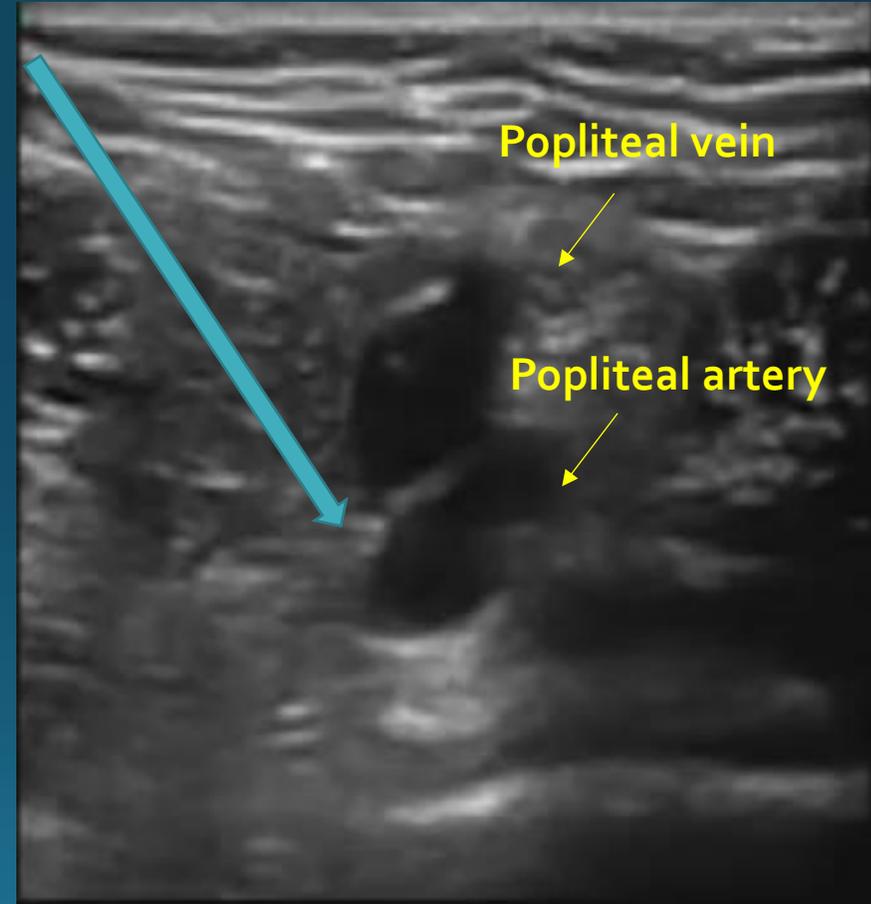
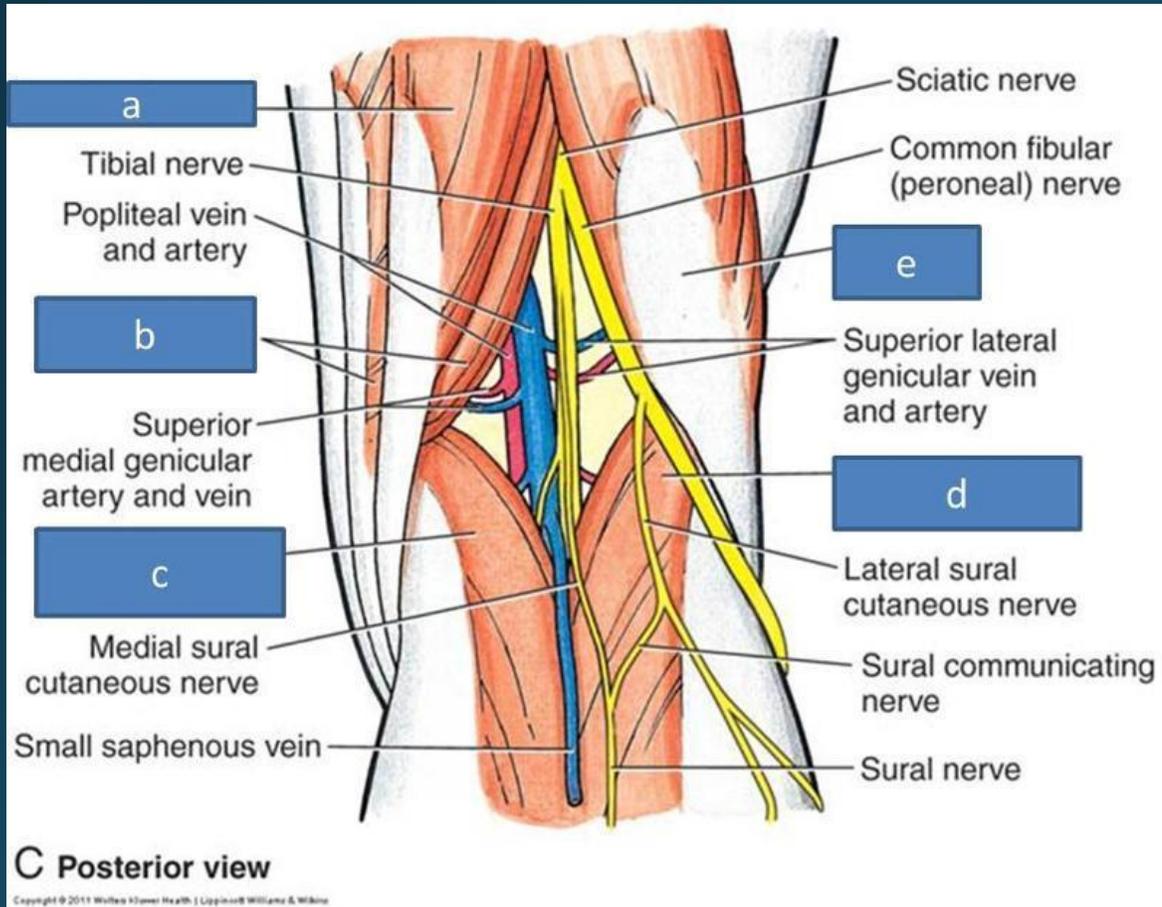
Mickey Mouse Sign



Ipsilateral Antegrade Femoral Access



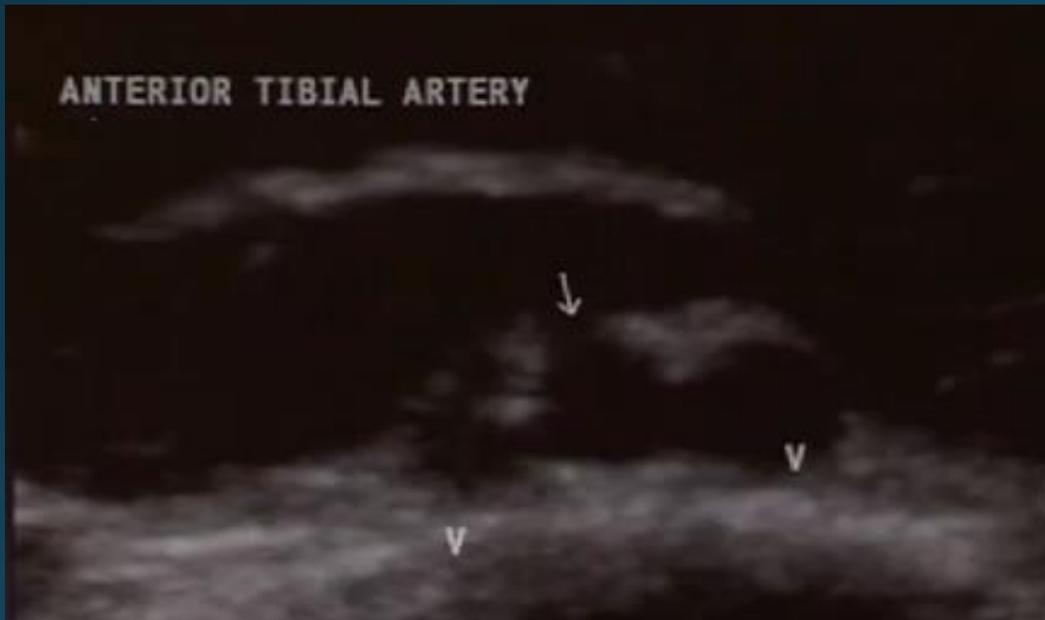
Popliteal ultrasound



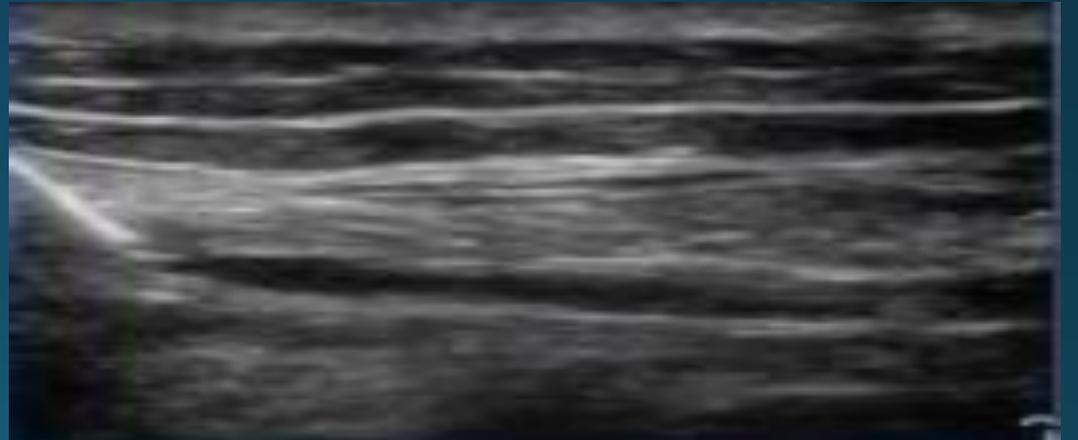
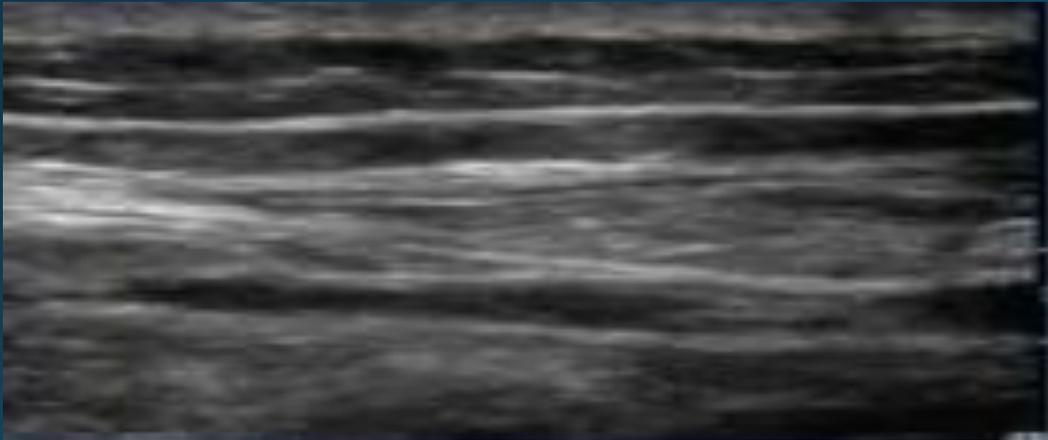
Popliteal artery puncture



Pedal Arteries



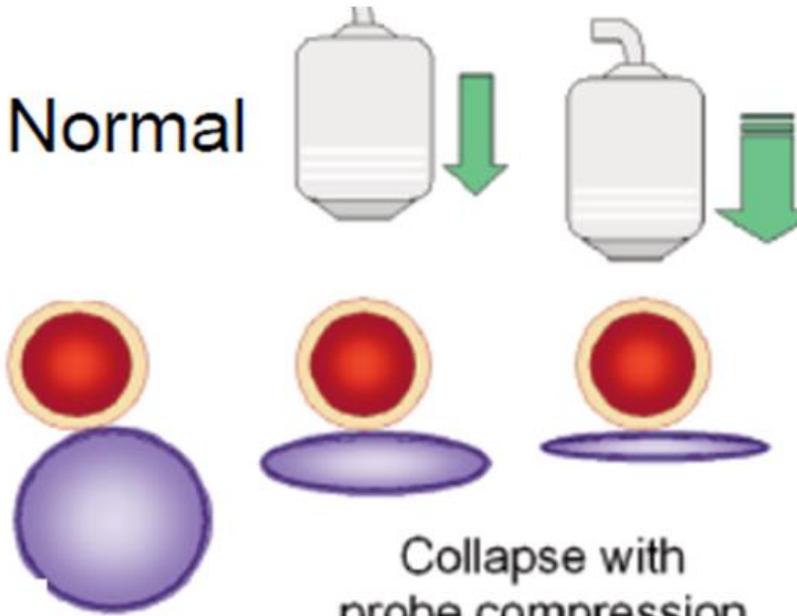
Pedal Puncture



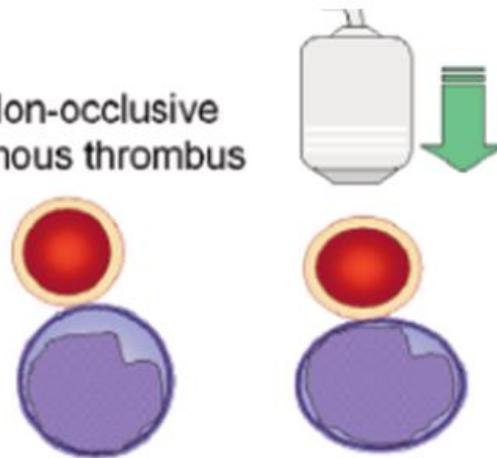
Ultrasound-guided Venous Access

DVT

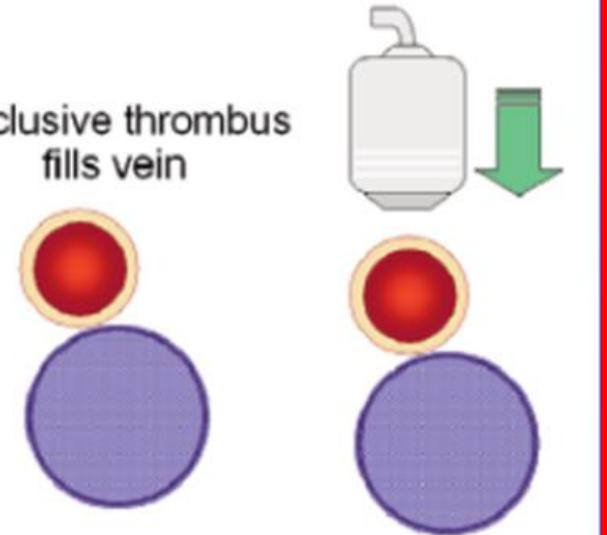
Normal



Non-occlusive
venous thrombus



Occlusive thrombus
fills vein



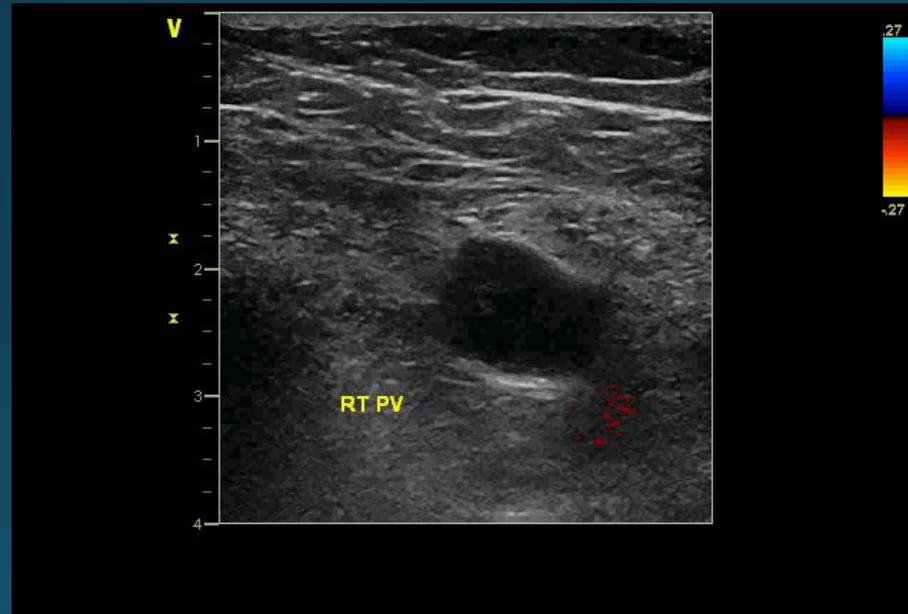
Venous compression
limited

Incompressible

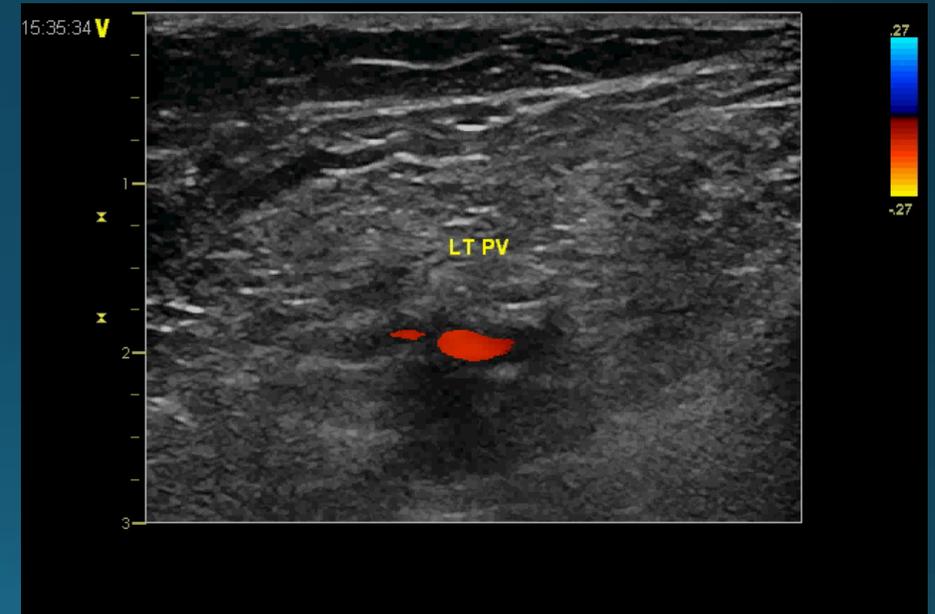
Non-compressible

Popliteal Vein

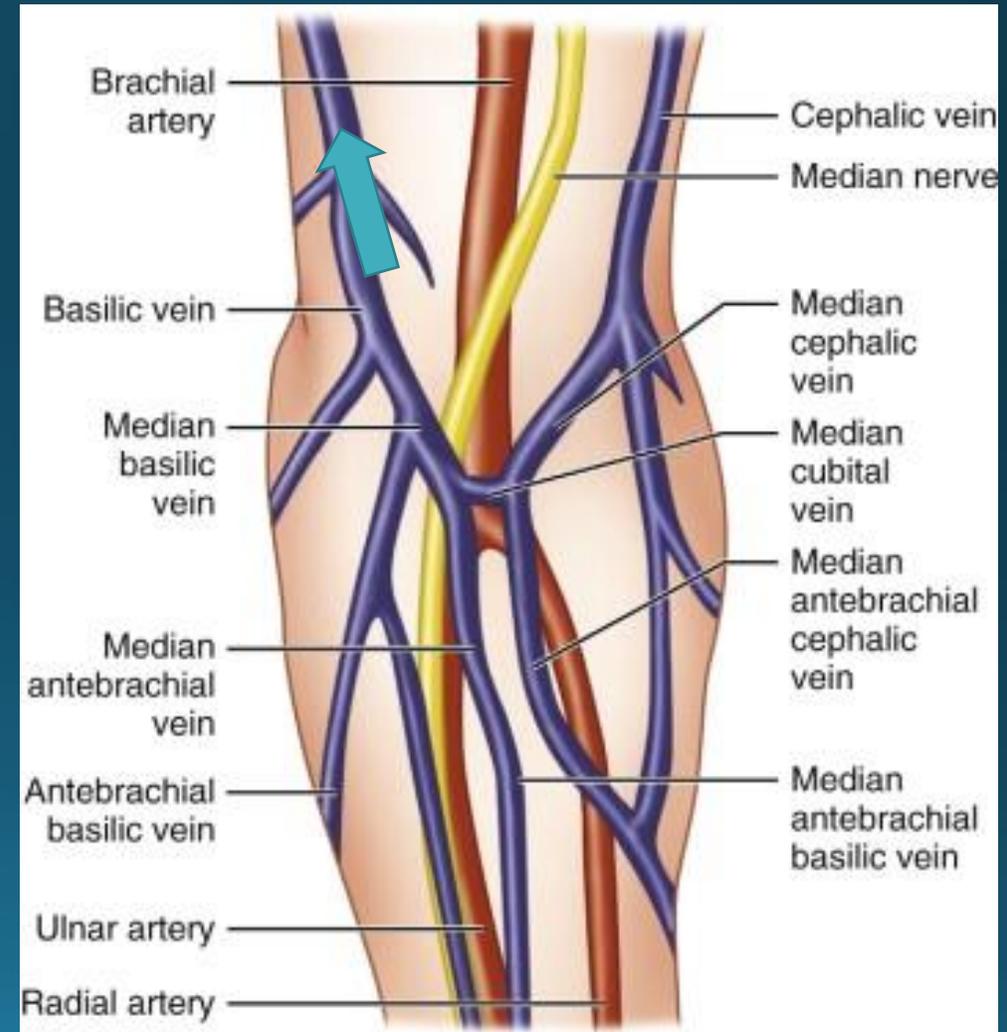
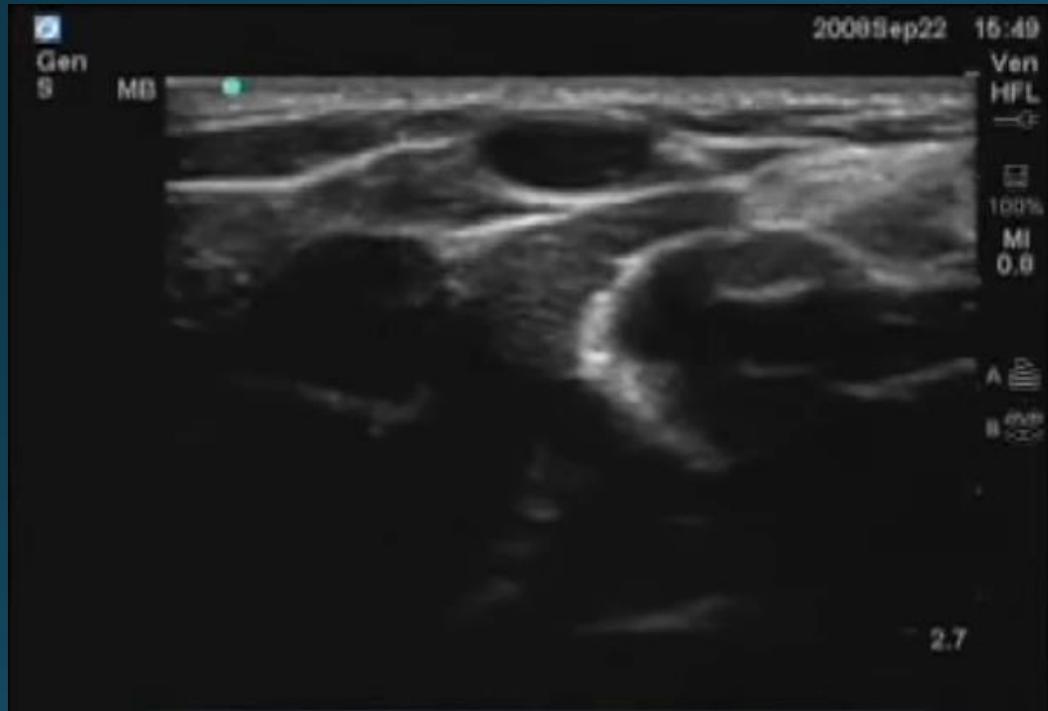
Noncompressible



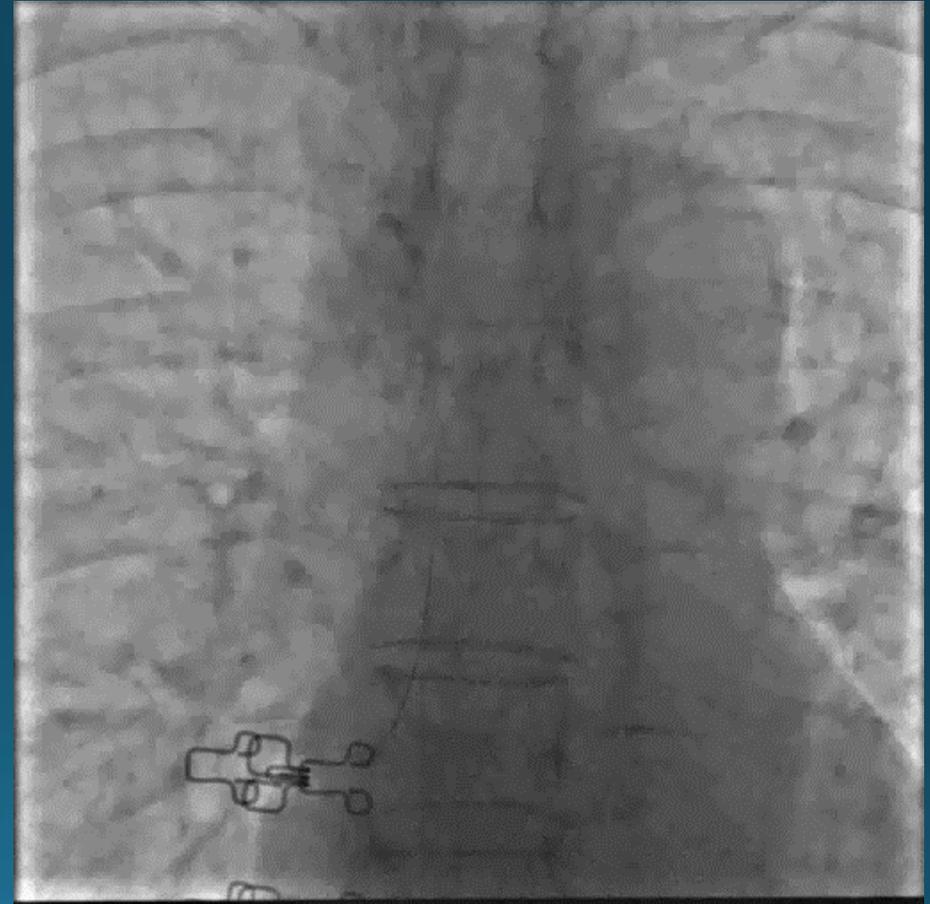
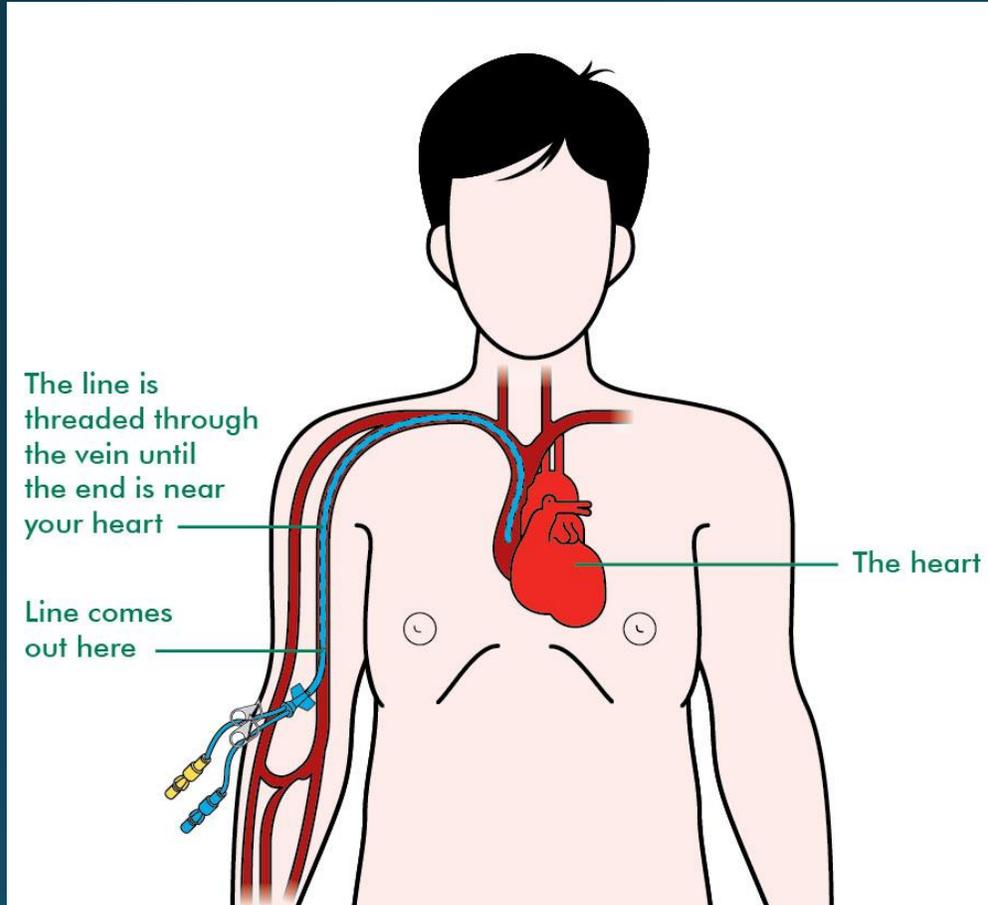
Compressible



Basilic or Cephalic Vein Puncture



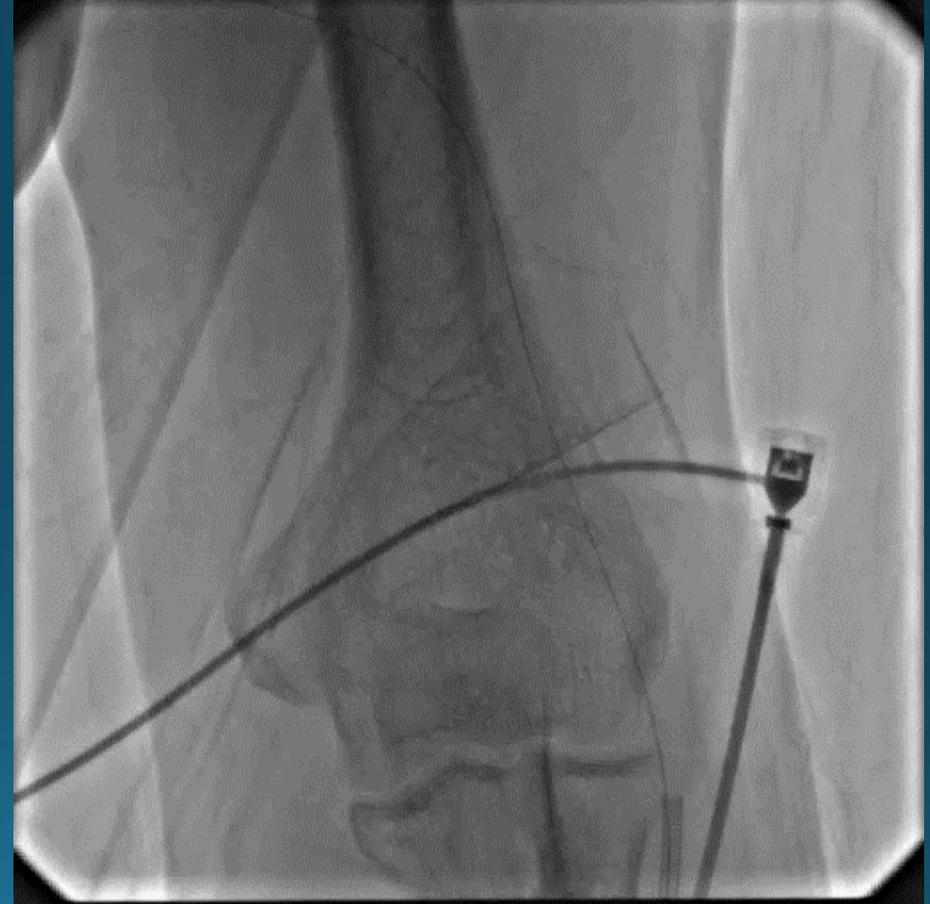
Peripherally Inserted Central Catheter (PICC)



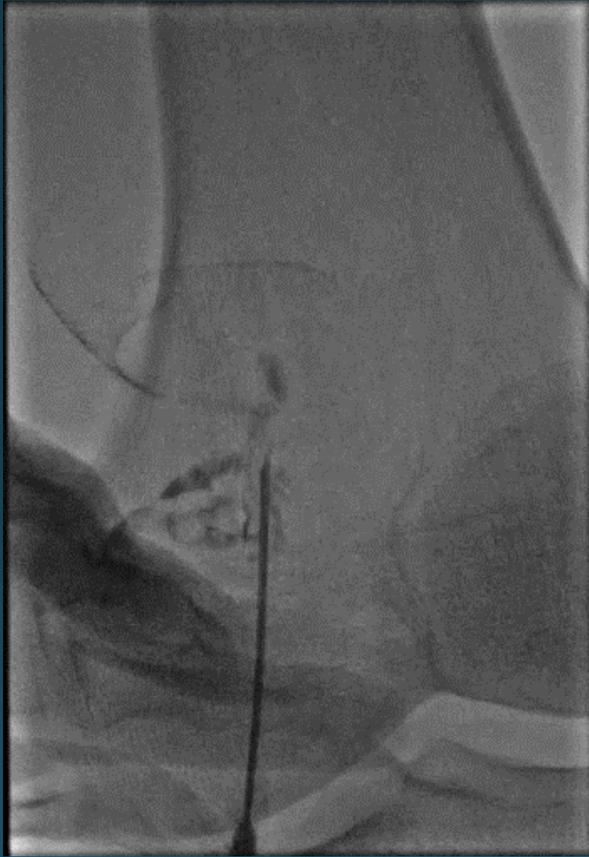
Ultrasound-guided basilic vein puncture



Hemodialysis Access PTA



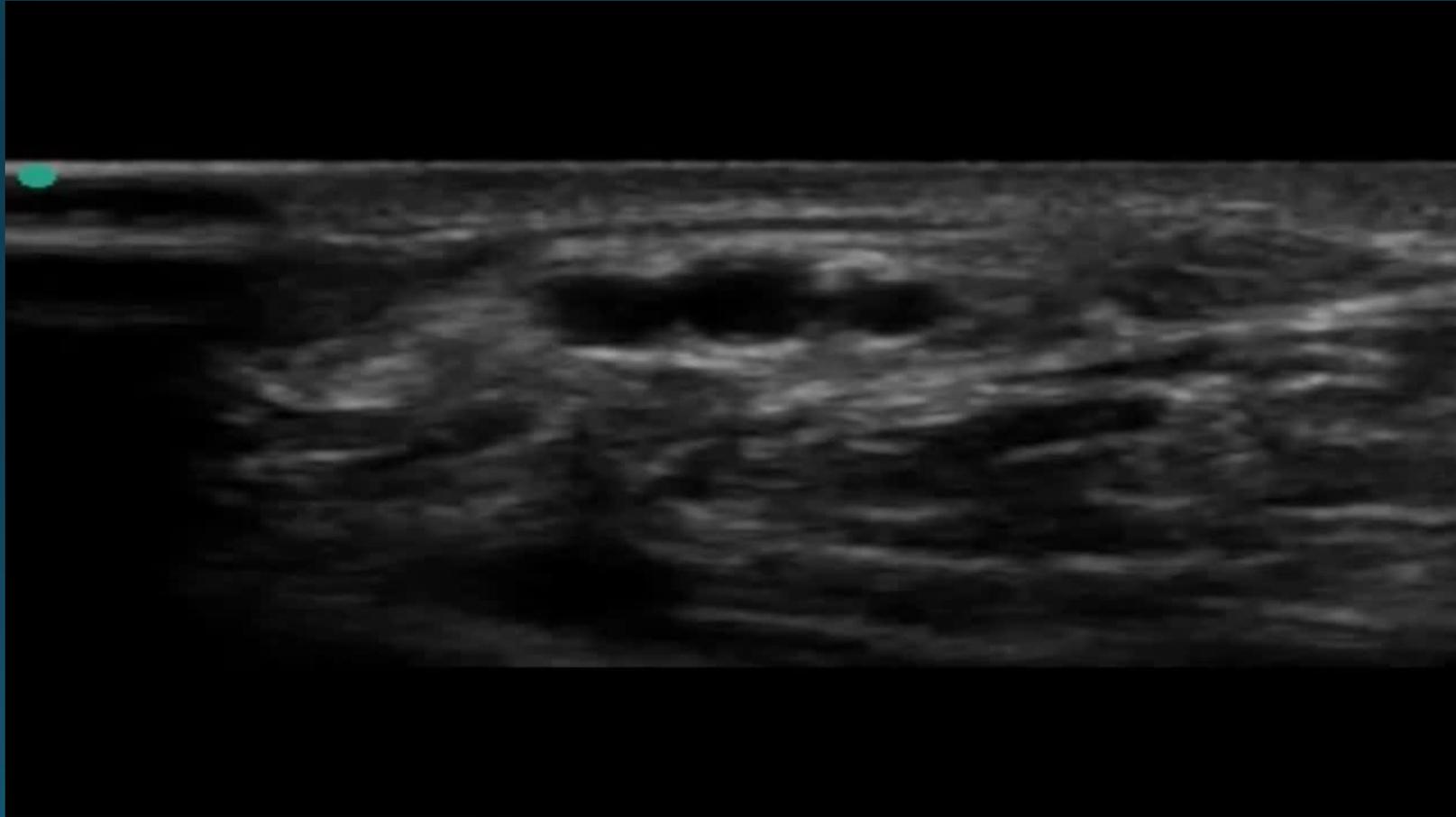
Catheter-Directed Thrombolysis for Acute DVT



Even for

Radial artery

Radial Artery



US-guided Radial Artery Puncture

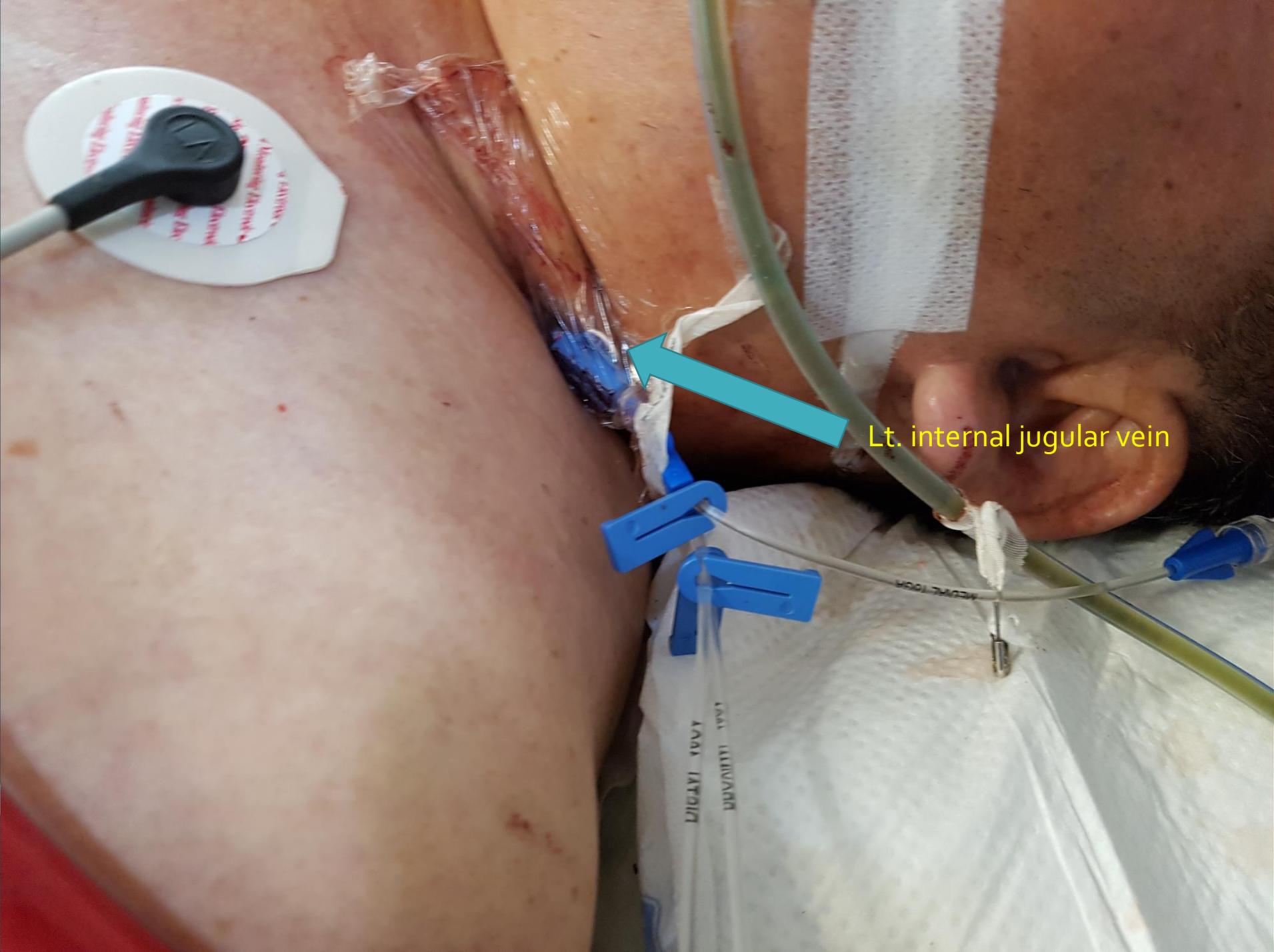


Palpation vs. Ultrasound Guidance for Transradial Catheterization

	Ultrasound Guidance (n=236)	Palpation (n=237)	<i>P</i> Value
Number of Attempts	1.65±1.2	3.05±3.4	<.0001
Time to Sheath Insertion, sec			
Mean	83±78	113±124	.0016
Median (IQR)	60 (42-91)	75 (50-119)	<.005
First Pass Success Rate	64.8%	43.9%	<.0001

Extra-Corporeal Cardiopulmonary Resuscitation (ECPR) - ECMO

- Rt. Common femoral artery for arterial cannula
- Rt. Common femoral vein for venous cannula
- Lt. Common femoral artery for coronary angiography
- Antegrade Rt. Superficial femoral artery for distal perfusion
- Rt. radial artery for (Harlequin syndrome) monitoring



Lt. internal jugular vein



Summary

- Ultrasound guided vascular access is reliable & safe (possible now)
- Tactile and Fluoro-guided vascular accesses are outdated standards
- Ultrasound-guided access needs learning curve

A person is performing a handstand on a sandy beach. The scene is captured at sunset or sunrise, with a warm, golden glow in the sky. The person's legs are raised high, and their arms are planted firmly on the sand. The background shows a calm sea and a line of trees on the horizon.

Keep trying



경청해주셔서 감사합니다.

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