

Two Point Compression to Rule out DVT

Susanna Shin, MD, FACS

Assistant Professor, University of Washington
Chief of Vascular Surgery, Valley Medical Center

DISCLOSURE

Susanna Shin, MD, FACS

- No relevant financial relationship reported



Lower Extremity Venous Duplex



- Rule Out DVT
 - Commonly ordered
 - Over utilized?
 - RJ Fowl, JVS 23 (1996)
 - University of Cincinnati Medical Center
 - 2993 LEV – 13.1% positive for proximal DVT
 - Deep and superficial venous system



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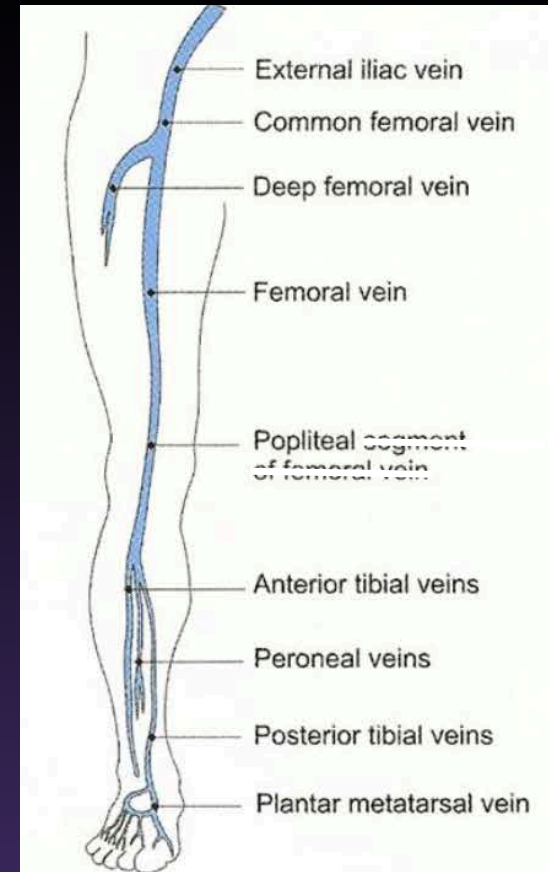
- Emergency Room
 - January – December 2014
 - 1265 pts referred for LE Venous duplex to R/O DVT
 - 220 (17.4%) studies positive for DVT
 - RVT on call 24 hours a day for vascular studies
 - No screening for ordering the study



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- Current Protocol
 - Formal Whole Leg Venous Ultrasound (WLUS)
 - Most common method to diagnosis DVT
 - Costly
 - Delays diagnosis vs discharge
 - Veins examined:
 - CFV, FV, PopV, PTV, PerV





2 Point Compression Ultrasound



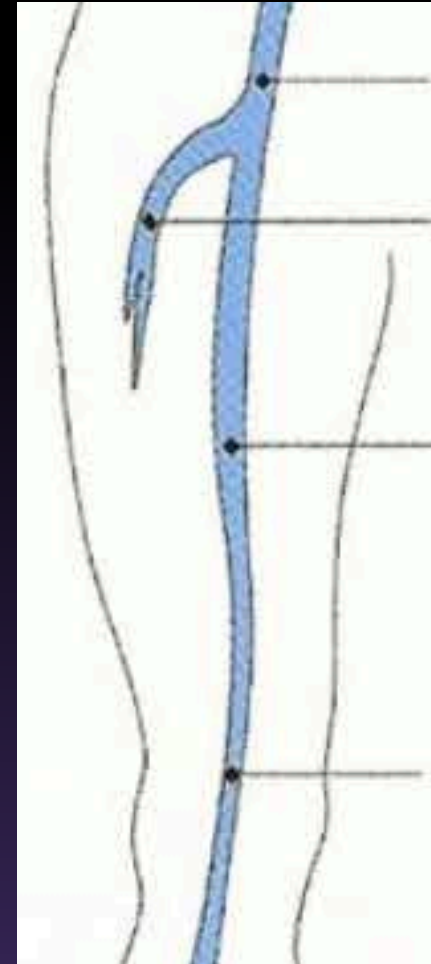
- AKA
 - 3 Point Compression Ultrasound
 - Compression Ultrasound of Proximal Veins
 - 2 Zone or 2 Segment Compression Ultrasound
- Evaluate Groin (CFV & FV/DFV confluence) and Popliteal Vein



2 Point Compression US (2PCUS)



- Excellent accuracy detecting proximal DVT
 - CFV-FV/DFV, PopV
- FV DVT very rare without involving CFV or PopV
- ?Replace Whole Leg US in some centers



Common
Femoral Vein

Deep
Femoral Vein

Femoral Vein

Popliteal Vein



2 Point Compression Ultrasound



- Crisp et al, Ann Emerg Med, 56 (2010)
 - Prospective
 - 47 ED physicians performed 199 exams
 - 45 proximal lower extremity DVT
 - 100% sensitivity, 99% specificity
- Burnside et al, Acad Emerg Med, 15 (2008)
 - Review of ED physician 2PCU
 - 1162 publications → 6 studies included
 - 936 patients
 - 95% sensitivity, 96% specificity



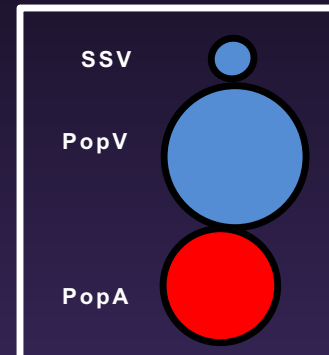
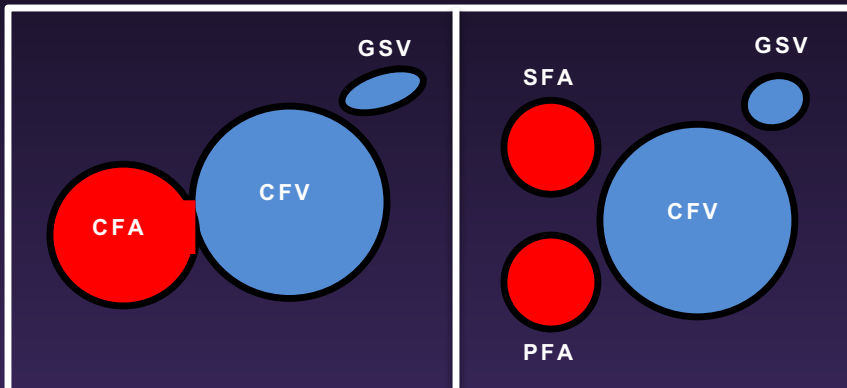
2 Point Compression Ultrasound



- Technique
 - Patient flat, reverse trendelenberg
 - Lower extremity Frog-legged
 - Veins examined only in transverse orientation
 - Compression looking for coapting of the vein
 - Inguinal crease (CFV, PFV/FV)
 - Behind the knee (Popliteal Vein)



2 Point Compression Ultrasound





DVT: Proximal vs Calf Vein



- Distinct entities based on natural history
- Proximal DVT
 - Untreated → 30-50% PE risk
- Calf Vein DVT
 - Not well-defined PE Risk from Calf Vein DVT
 - ?PE without proximal propagation – clinically significant?
 - 15-25% Risk of proximal propagation (FV, PopV)
 - Subsequent risk of PE



DVT: Proximal vs Calf Vein Treatment



- Proximal: Anti-coagulation 3-6 months
- Distal: Controversial
 - Changed in the past 2 decades
 - ACCP Guidelines, 10th Ed (2016)
 - Without severe symptoms or risk factors for extension
 - NO Anti-coagulation
 - Serial Ultrasound: No propagation → No Anti-coagulation
 - With severe symptoms or ongoing risk factors
 - Treat as Proximal DVT
 - Previous Guidelines recommended shorter duration of anti-coag



ACCP Guidelines, 9th Ed (2012)



- For suspected **FIRST DVT**
 1. Clinical Risk assessment
 - Well's Score for DVT
 2. Blood Tests
 - D-Dimer
 3. Vascular Imaging
 - Ultrasound



ACCP Guidelines, 9th Ed (2012)



- Well's Score for DVT
 - Risk stratification

Wells score for DVT*

- +1 Cancer
- +1 Paralysis or recent plaster cast
- +1 Bed rest >3 days or surgery <4 weeks
- +1 Pain on palpation of deep veins
- +1 Swelling of entire leg
- +1 Diameter difference on affected calf >3 cm
- +1 Pitting oedema (affected side only)
- +1 Dilated superficial veins (affected side)
- 2 Alternative diagnosis at least as probable as DVT

High	≥ 3
Moderate	1-2
Low	0



ACCP Guidelines, 9th Ed (2012)



- Well's Score for DVT
 - Low Probability
 - – D-Dimer and/or 2PCUS → NO further testing
 - + D-Dimer → 2PCUS (NOT WLUS)
 - Moderate Probability
 - – D-Dimer or WLUS → No further testing
 - – 2PCUS & D-Dimer or – 2PCUS x 2 → No further testing
 - High Probability
 - – WLUS → No further testing
 - – 2PCUS x 2 or – 2PCUS & D-Dimer → No further testing



ACCP Guidelines, 9th Ed (2012)



- Take home message
 - Clinical risk assessment is **EXTREMELY** important in the evaluation for DVT
 - 2PCUS with – D-Dimer is extremely reliable way to R/O DVT
 - WLUS can reliably R/O DVT without any other diagnostic test but is **OFTEN** unnecessary
 - For patients **WITHOUT** prior history of DVT



Conclusions

- 2 point compression ultrasound is a simple and useful technique that can be reliably used to rule out DVT in low risk patients to decrease utilization of whole leg ultrasounds.
- Clinical judgment should be used to select those higher risk patients who should undergo whole leg ultrasound to rule out DVT.



Thank you