
Selection and work up for the right patients suspected of deep venous disease

RAGHU KOLLURI, MS, MD, RVT

SYSTEM MEDICAL DIRECTOR – VASCULAR MEDICINE/ VASCULAR LABORATORIES

DIRECTOR - VASCULAR CORE LAB

OHIOHEALTH HEART AND VASCULAR

RIVERSIDE METHODIST HOSPITAL, COLUMBUS, OH.

Disclosure

- Medtronic – Consultant/ Speaker
- Bard – Data Safety Committee
- Philips – Consultant
- Boston Scientific – Consultant/ Speaker
- Inari – Consultant
- Spectranetics – Consultant
- BTG – Consultant/ Research Grant

The opinions and clinical experiences presented herein are for informational purposes only. Dr. Kolluri is a paid consultant for Philips. The results from their experiences may not be predictive for all patients. Individual results may vary depending on a variety of patient specific attributes and related factors.

Pathophysiology: 2 components

REFLUX

Dilatation of vein wall leads to valve insufficiency

Monocytes may destroy vein valves

Retrograde flow results in distal venous hypertension

OBSTRUCTION

Thrombosis and subsequent fibrosis obstruct venous outflow

Damage to vein valves may also cause reflux

Both contribute to venous hypertension

The presence of both is far worse than either one alone

In the clinic

History

Aching

Tiredness, heaviness in legs

heaviness, achiness, swelling, throbbing, itching –
“HASTI”

Swelling (peripheral edema)

Itching

Restless legs

Numbness

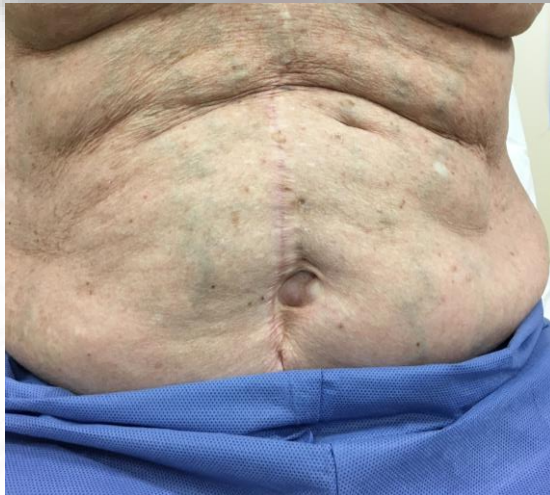
J Vasc Surg. 2011;53:2S-48S.

CEAP classification and description	
1. Clinical classification	
C ₀ :	No visible or palpable signs of venous disease
C ₁ :	Telangiectases or reticular veins
C ₂ :	Varicose veins
C ₃ :	Edema
C _{4a} :	Pigmentation and/or eczema
C _{4b} :	Lipodermatosclerosis and/or atrophy
C ₅ :	Healed venous ulcer
C ₆ :	Active venous ulcer
3. Anatomic classification	
E _p :	Primary
E _s :	Secondary (postthrombotic)
E _n :	No venous etiology identified
4. Pathophysiologic classification	
P _r :	Reflux
P _o :	Obstruction
P _{ro} :	Reflux and obstruction
P _n :	No venous pathophysiology identifiable

Non-Saphenous/ Pelvic Varicosities



Abdominal Veins



Abdominal and pubic collateral veins as indicators of deep venous obstruction

Ralph L. M. Kurstjens, MD,^{a,b} Timme M. A. J. van Vuuren, MD,^{a,b} Mark A. F. de Wolf, MD,^{a,b} Rick de Graaf, MD, PhD,^c Carsten W. K. P. Arnoldussen, MD,^{c,d} and Cees H. A. Wittens, MD, PhD,^{a,b,e}
Maastricht and Venlo, The Netherlands; and Aachen, Germany

Objective: Chronic deep venous obstruction can cause a significant loss of quality of life, although it can be treated successfully by stenting. A clear referral pattern for additional imaging is warranted in patients with lower limb complaints. The aim of this study was to determine the value of clinically visible abdominal wall collateral veins in the diagnosis of a potentially treatable deep venous obstruction.

Methods: A total of 295 patients referred for evaluation at a tertiary venous clinic with a collateral vein on the abdominal wall or pubic bone, visible on physical examination, were retrospectively analyzed and compared with a randomly selected control group of 365 patients without such a collateral vein. Duplex ultrasound, magnetic resonance venography, computed tomography venography, and conventional venography were used to determine the presence or absence of deep venous obstruction.

Results: Mean age of the group with a positive collateral was 43.5 ± 13.7 (6-76) years compared with 44.7 ± 14.2 (16-89)

years in the control group. In the collateral group, 66.1% were female compared with 63.3% in the control group. Sensitivity of the abdominal wall collateral vein for any obstruction at the level of the groin or more proximal was 53% (95% confidence interval [CI], 48-57); specificity, 86% (95% CI, 79-91); positive predictive value, 93% (95% CI, 90-96); and negative predictive value, 32% (95% CI, 28-37). Sensitivity was 68% (95% CI, 62-73) for higher degrees of post-thrombotic obstruction and 27% (95% CI, 19-36) in iliac vein compression.

Conclusions: A collateral vein on the abdominal wall or across the pubic bone in patients with complaints of the lower limb has an excellent positive predictive value for deep venous obstructive disease at the level of the groin or higher. Such collateral veins should therefore not be removed, and symptomatic patients could be offered further diagnostics and treatment. (J Vasc Surg: Venous and Lym Dis 2016;4:426-33.)

Stasis or Gravitational Eczema



In the wound center



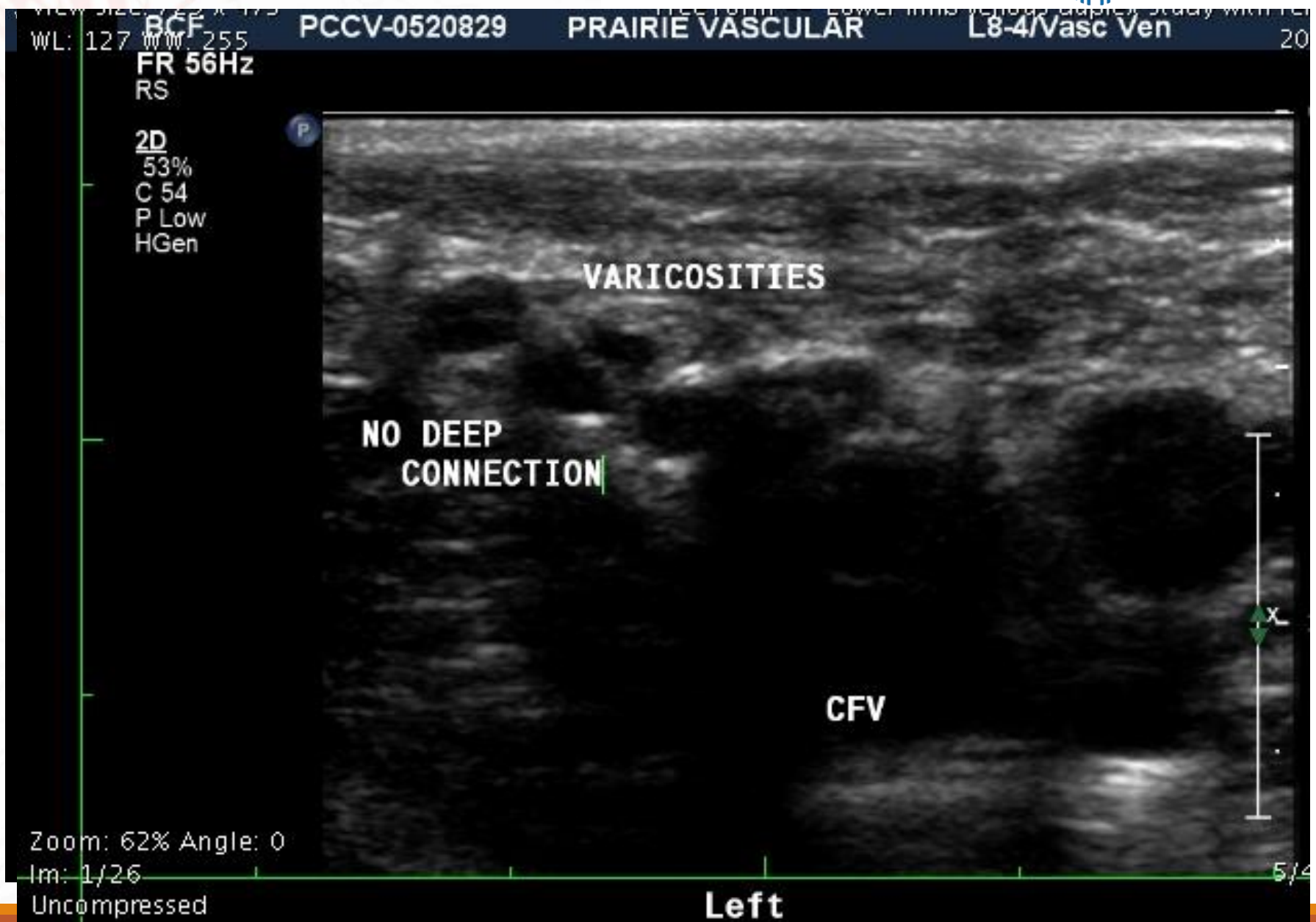
Venous Stasis Ulcers



Venous Ulcers – Atrophy Blanche



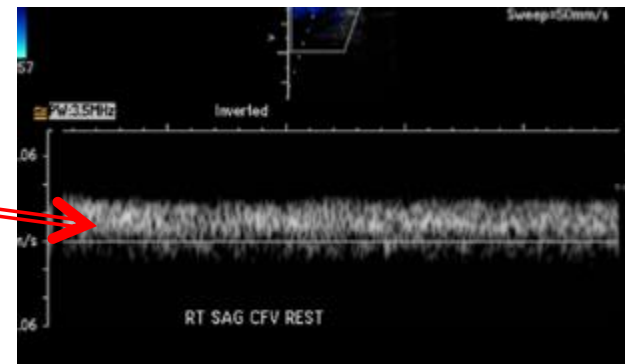
In the Vascular Lab

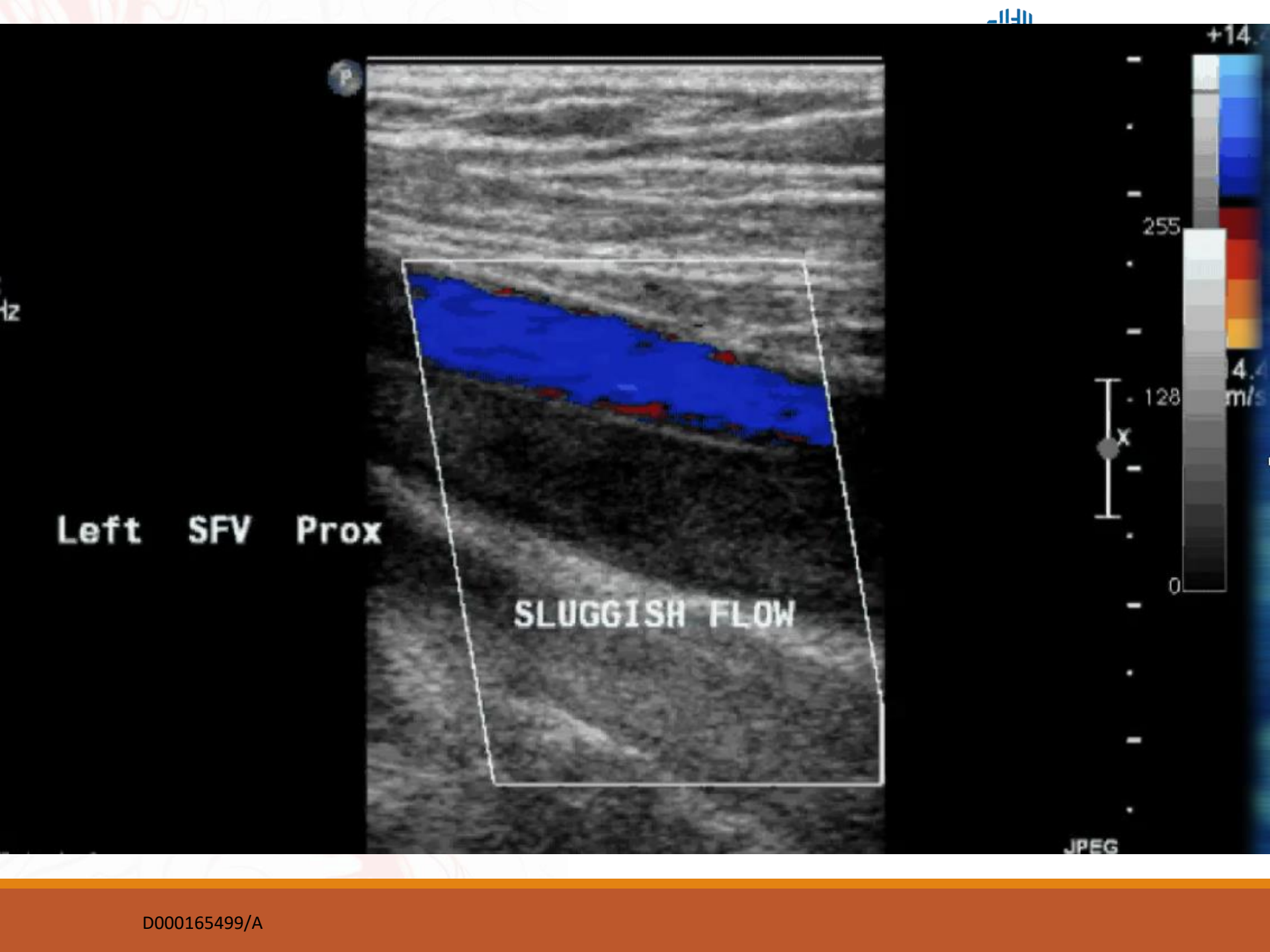




Poor Augmentation

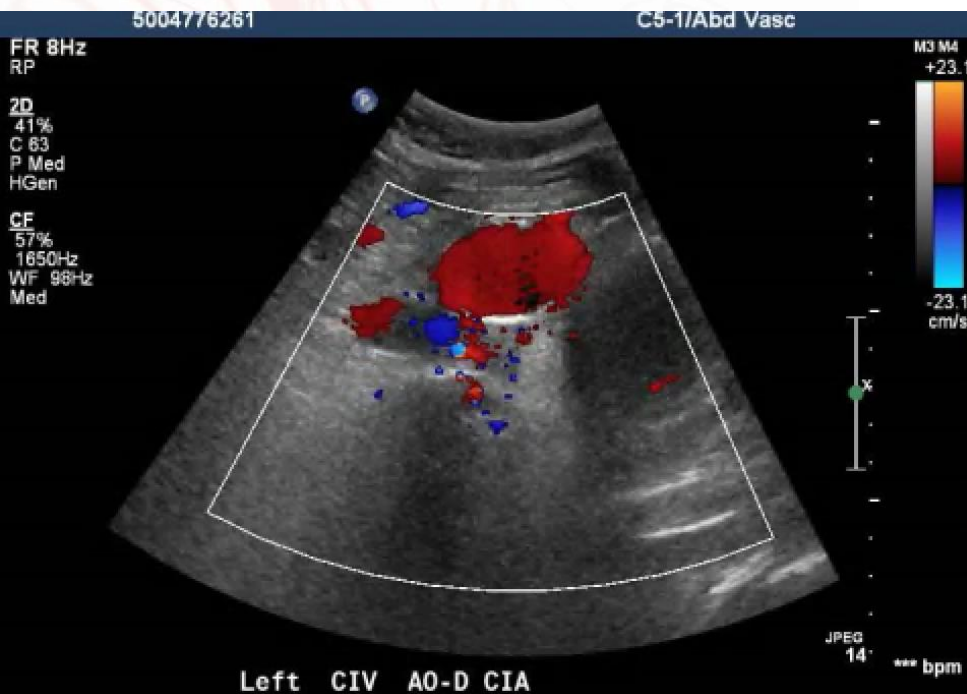
Lack of phasicity



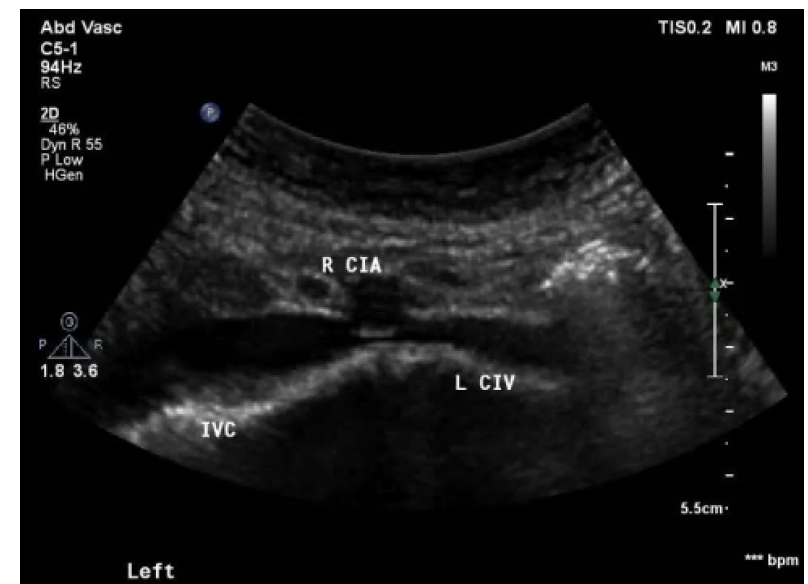
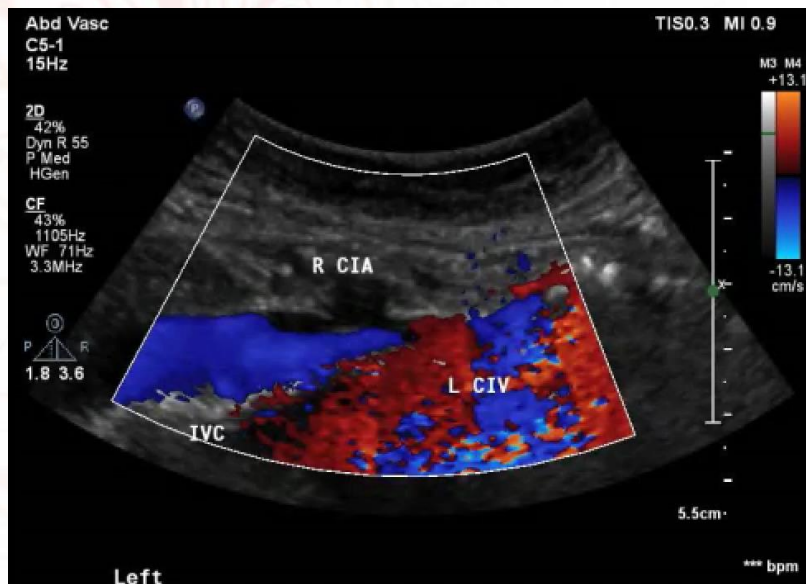




Pelvic Duplex

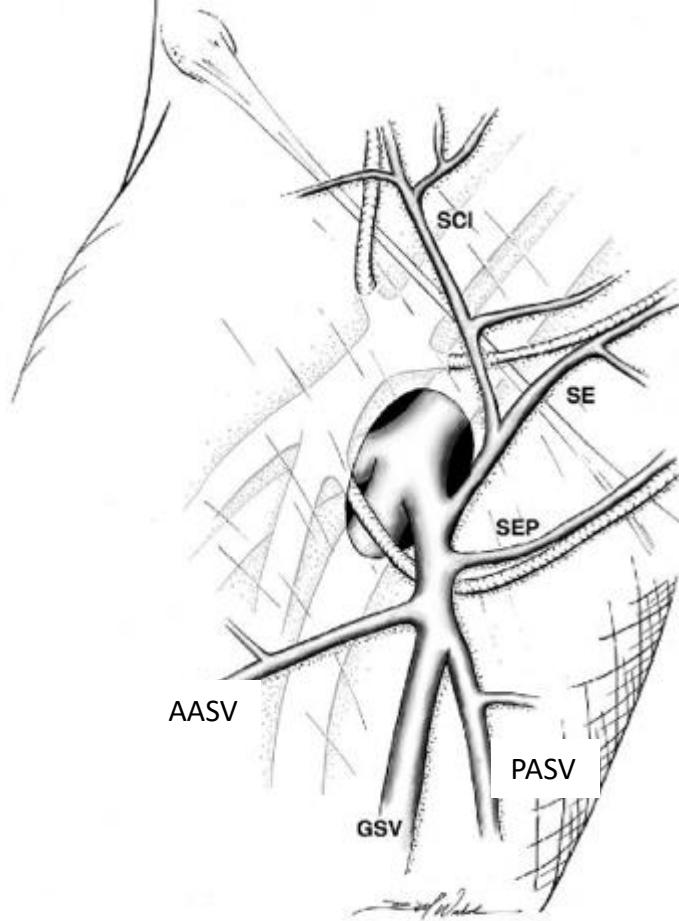


Pelvic Duplex



Know your groin veins....!

SFJ Tributaries



SE – Superficial Epigastric (Land mark for ablative therapies)

SEP – Superficial External Pudendal

SCI – Superficial Circumflex Iliac

Case study

42 yr old female

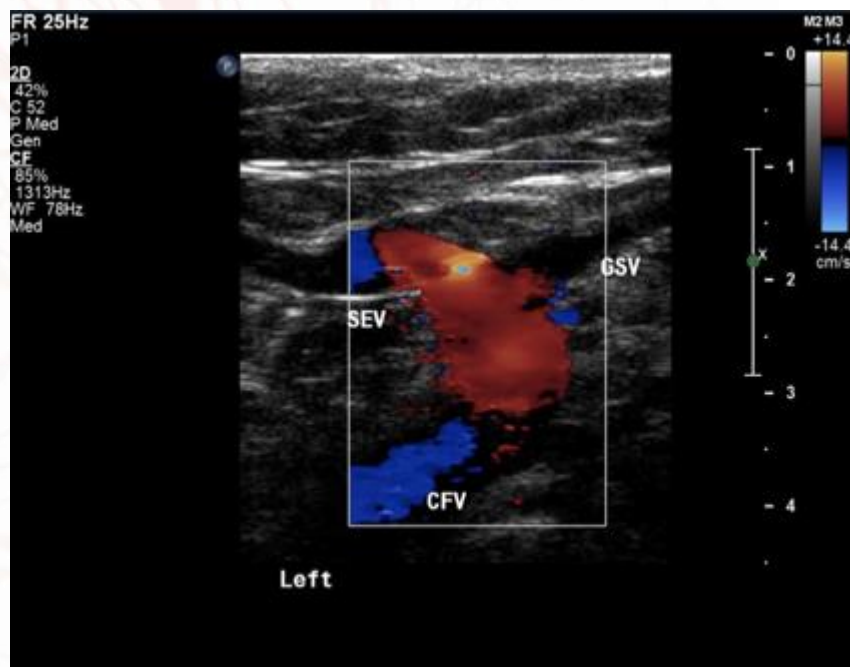
Left Lower Extremity edema chronic with left LE ankle ulcers (recurrent) for 2 yrs.

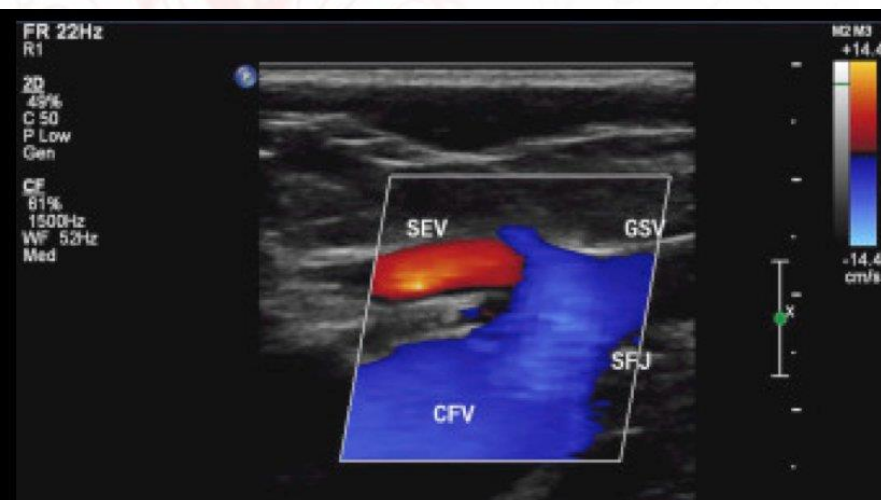
No prior Hx of DVT.

Duplex

- Superficial venous reflux in GSV
- NO deep vein reflux
- No DVT or SVT
- Left SEV flow cephalad

Results from this case study are not predictive of future results.





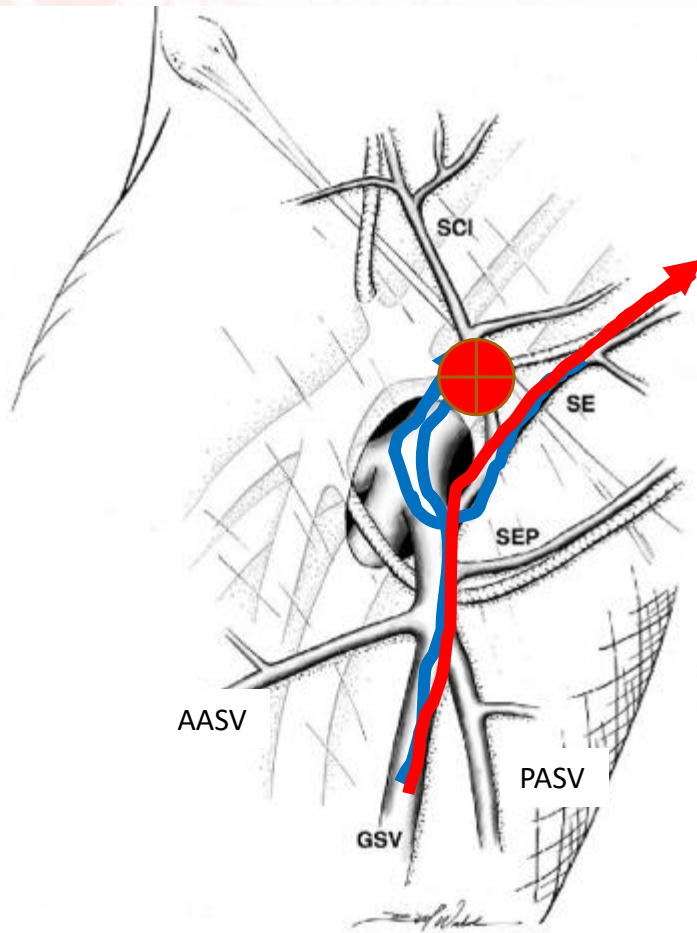
SEV Flow Caudad = Normal flow



SEV FLOW CEPHALAD = PROXIMAL
ILIAC/IVC VEIN OCCLUSION

J Vasc Surg Venous Lymphat Disord Volume 5, Issue 3, May 2017, Pages 358–362

SFJ Tributaries



SE – Superficial Epigastric (Land mark for ablative therapies)

SEP – Superficial External Pudendal

SCI – Superficial Circumflex Iliac

Iliac obstruction is not
always on the left!!

Case Study

51 yr old male with right leg swelling and pain

The venous incompetence study –

- extensive venous incompetence in the bilateral GSVs with numerous pelvic varicosities on the right side.

CTV

- suboptimal enhancement of the iliac veins
- no iliac vein thrombosis is seen.
- possible focal narrowing seen of the distal common iliac vein just above the iliac vein bifurcation.
- IVC patent

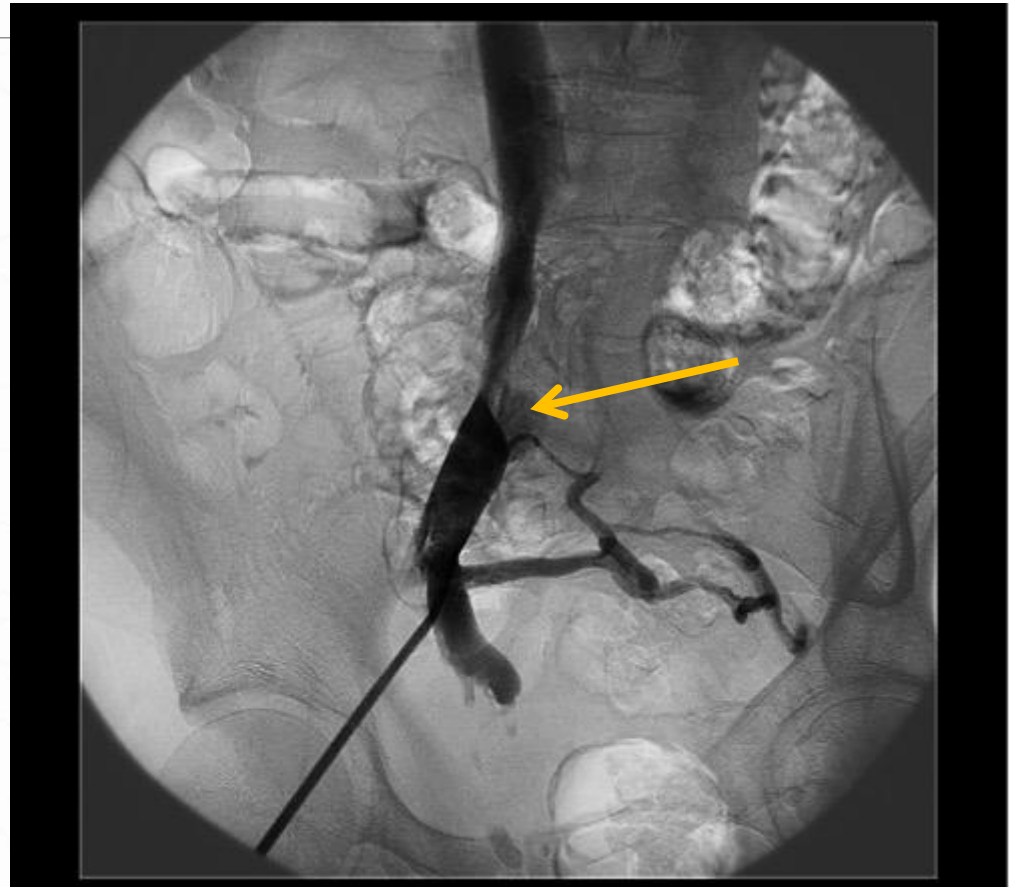
Results from this case study are not predictive of future results.

Case Study

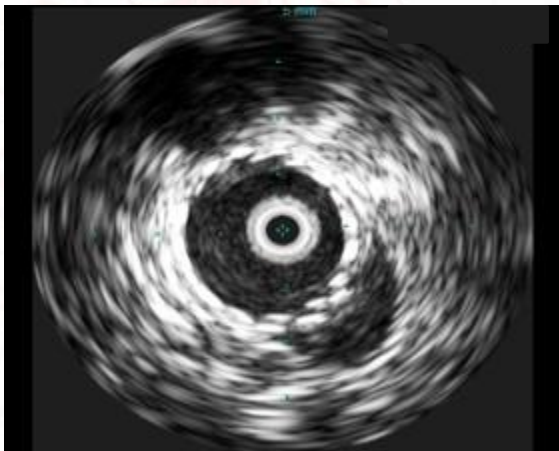
Further questioning about injuries

- At age 27 – Slipped and fell into a coal mine and was told that he had sacral fracture and it would heal.





There is an adjacent prominent osteophyte arising off the superior endplate of S1, which may be causing some degree of extrinsic compression.

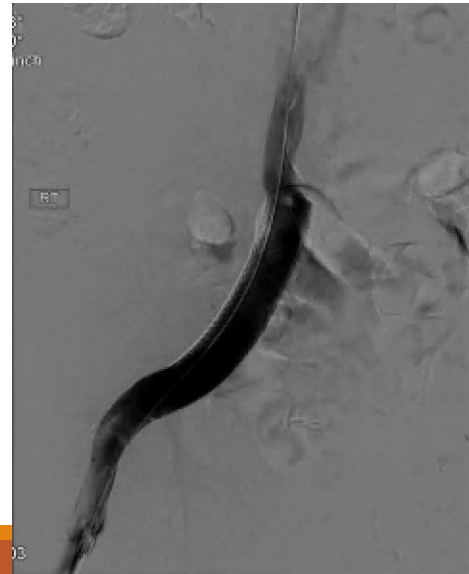
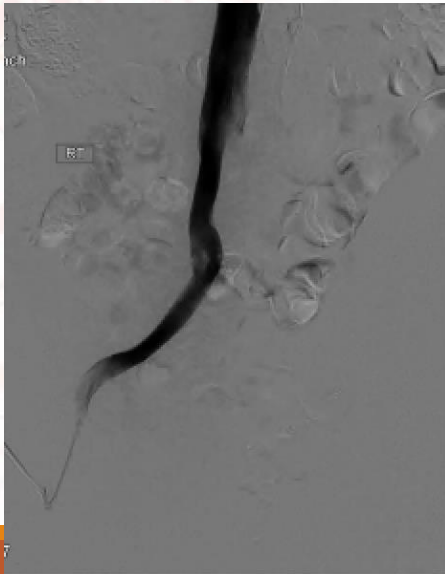


History is crucial

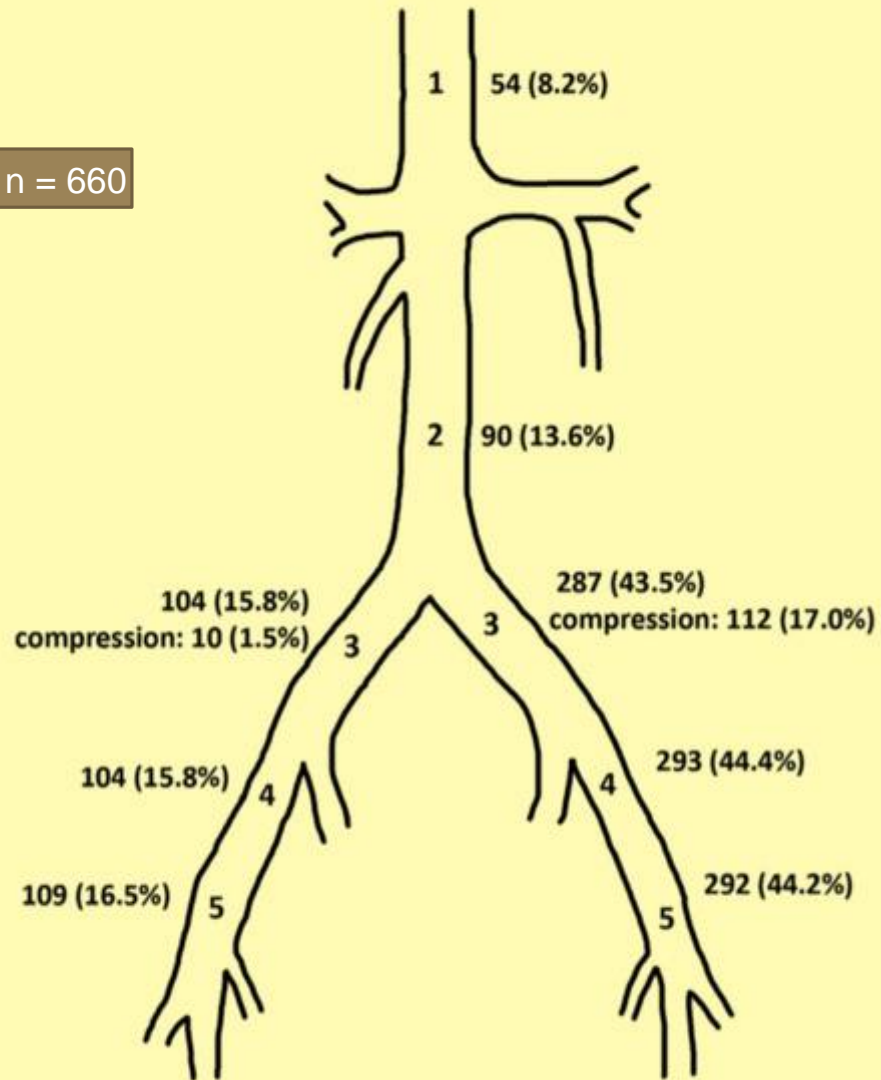
RLE CVI

Hx of laparotomy for diverticulitis years ago

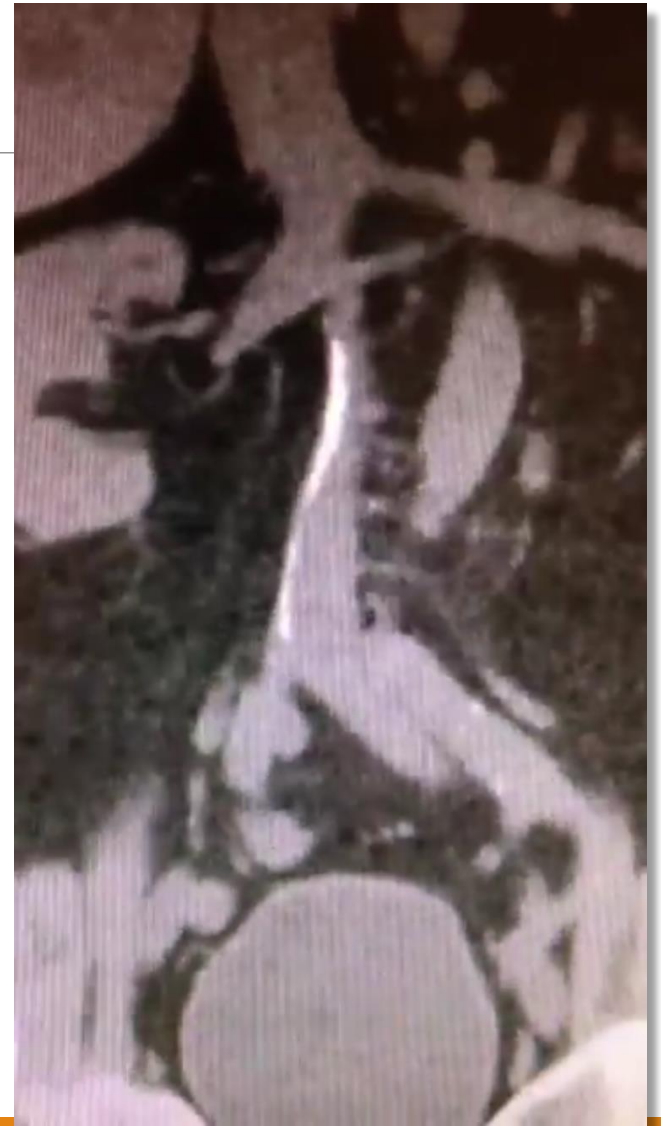
Op note – “sigmoid colon was adhered to the right pelvis and careful attention was paid to avoid injury to the right iliac vein”



n = 660



Old axial scans



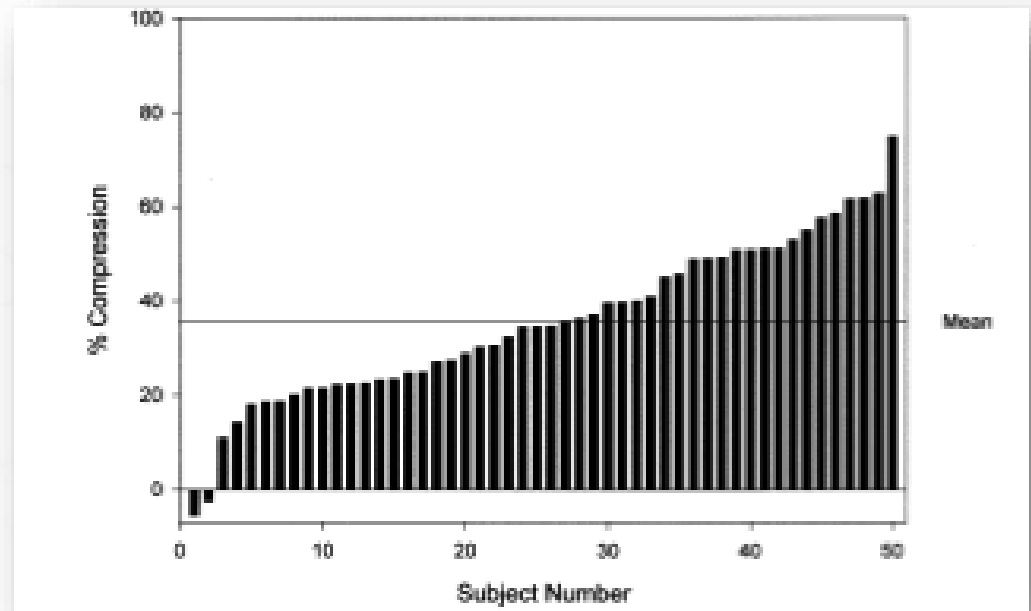
How Common Is Left CIV Compression?

1 Autopsy findings of 22% in 430 studies

- May-Thurner syndrome is widely believed to increase the risk of ipsilateral iliofemoral DVTs and venous hypertension

2CT findings:

- 24% had >50% stenosis
- 66% had >25% stenosis



1 May, Thurner, Angiology October 1957 8: 419-427

2 Kibbe, et al., J Vasc Surg 2004;39:937

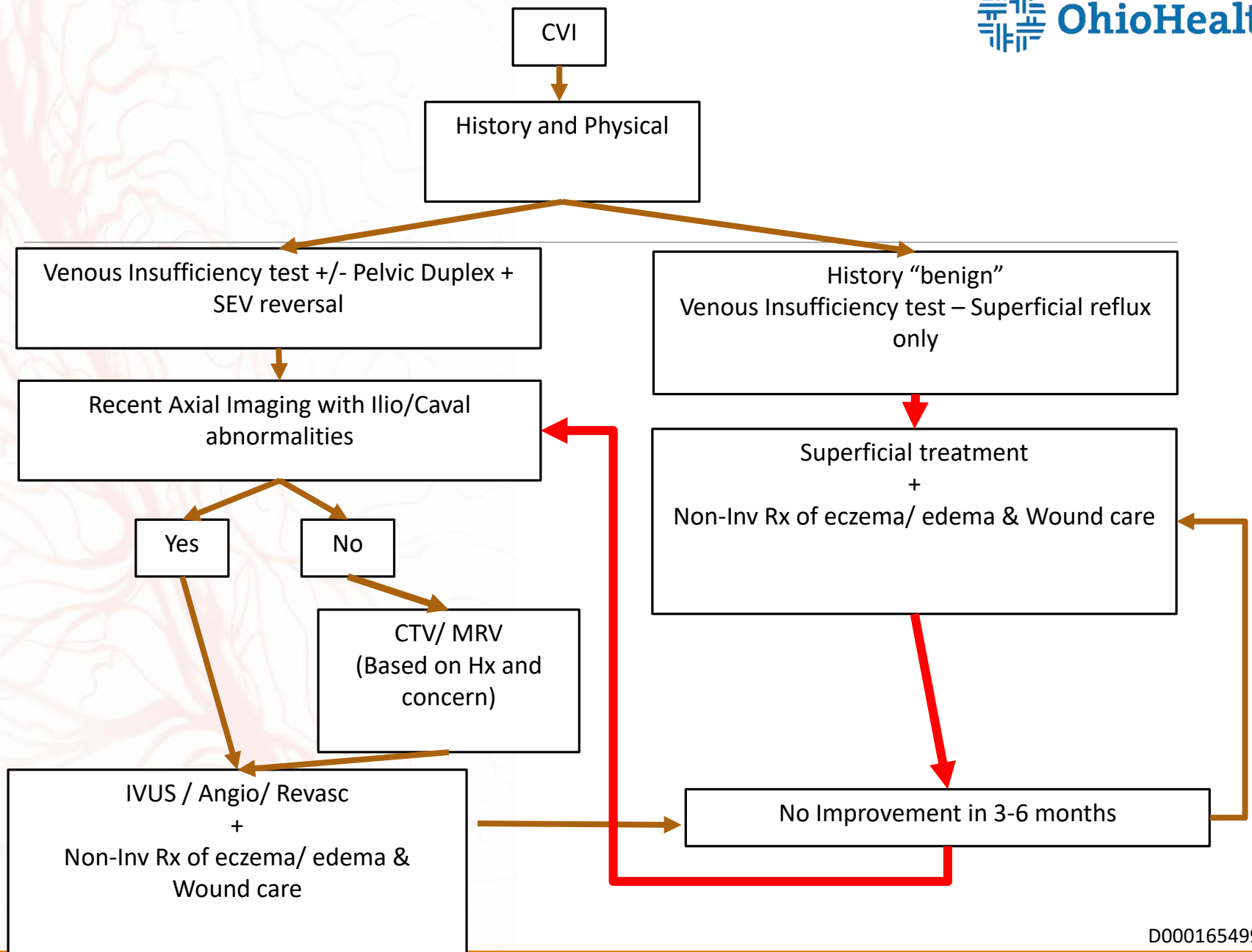
Deep vein Obstruction

CT and MR venography - iliac vein obstruction in patients with active and healed ulcers.

- 37% demonstrated iliac vein obstruction of at least 50%,
- 23% had obstruction of >80%.
- Independent Risk factors >80% -
 - Female gender
 - History of DVT
 - Deep Vein Reflux

J Vasc Surg 39:937-943, 2004

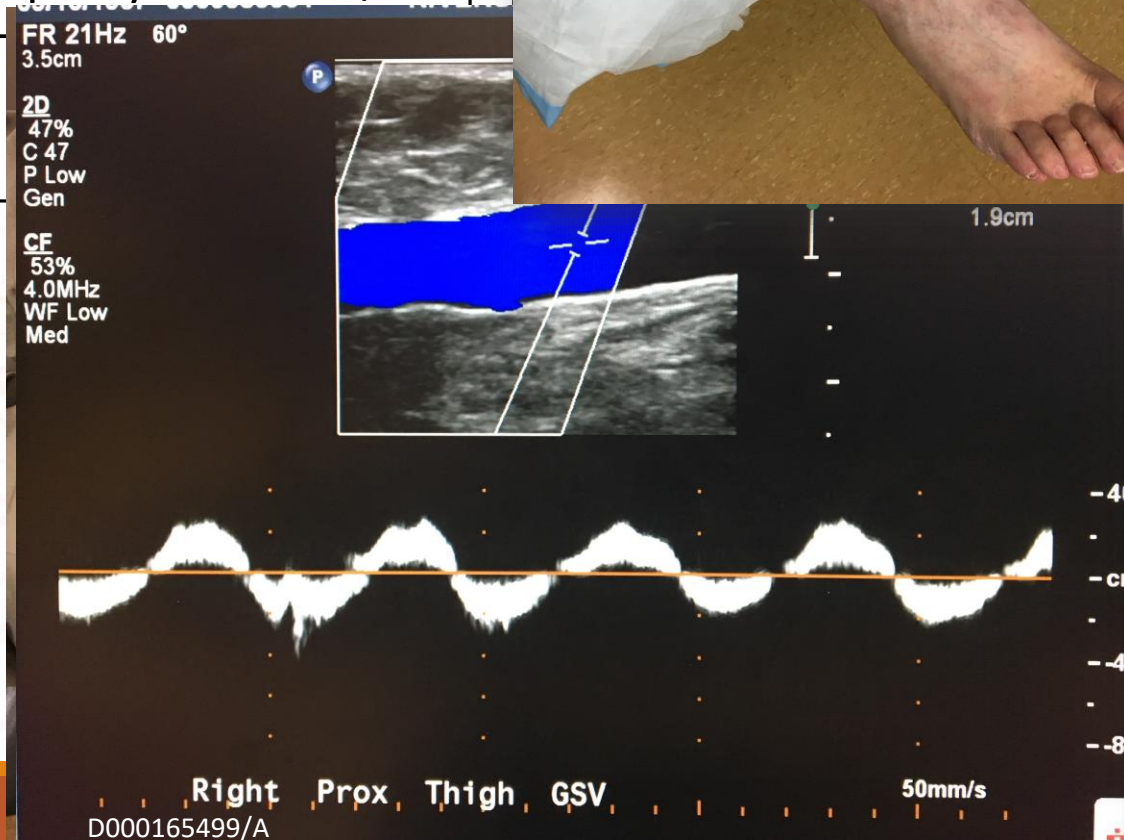
J Vasc Surg 53:1303-1308, 2011



D000165499/A

Tunnel vi

Neuropathy – 10-15%/
year



Thank You
