Is 50% Stenosis the Cutpoint for Stenting?

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Disclosures

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I Have No Disclosures

Post-Thrombotic vs Non-Thrombotic Obstruction

Defining Clinical & Hemodynamic Significance May Be Difficult

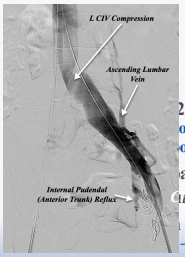
Non-Thrombotic
- Asymptomatic in most patients †
- Dependent on position & respiration
- Vague diagnostic criteria

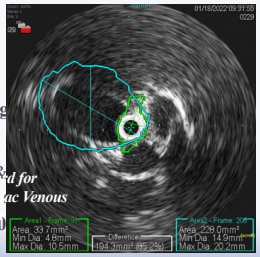
Post-Thrombotic
- Frequently Symptomatic *
- Independent of position & respiration
- More definitive diagnostic criteria

**Delis KT, Ann Surg 2004 † Nazzal M, Vascular 2015*

Venography vs IVUS in Iliac Venous Obstruction

Montminy ML, J Vasc Surg Venous & Lym Dis 2019





2 patients) underg
otic – 72%
arison of IVUS &
nable to identify
stenosis (p < .00
– 52 (0 – 100) %
- IVUS – 69 (50 – 90)%

VERSUS

d for
ac Venous

But…Can IVUS Identify a Relevant Threshold Stenosis?

Gagne P, J Vasc Surg Venous and Lym Dis 2018

- Clinical evaluation of IVUS in 100 C_4 – C_6 patients (VIDEO Trial)
- 68 patients stented (mean area stenosis 59 ± 17%)
  - Non-thrombotic – 48 (70%)
  - Post-thrombotic – 20 (30%)
- Clinical improvement - > 4 improvement in rVCSS @ 6 months
  - 26 (41%) improved
  - 38 (59%) not improved
- Optimal performance (overall) - > 54% area reduction threshold *(IVUS)*
  - Sensitivity – 83%
  - Specificity – 47%
  - AUC – 0.64 (poor diagnostic accuracy)
- Optimal performance (non-thrombotic) - > 61% mean diameter stenosis *(IVUS)*

But…Does This *Really* Predict Clinical Improvement?

Gagne P, J Vasc Surg Venous and Lym Dis 2018

Calculations From the VIDEO Trial Data

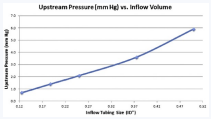
	IVUS > 50%	IVUS ≤ 50%	Total
Improved	21	4	25
Not Improved	25	13	38
	46	17	63

PPV = 45.7%
NPV = 76.5%

- ≥ 50% IVUS area reduction has NO diagnostic utility in C_4 – C_6 disease
- *VERY* unlikely to be any better in C_3 disease

Hemodynamics of Critical Venous Stenosis

Raju S, J Vasc Surg: Venous and Lym Dis 2014

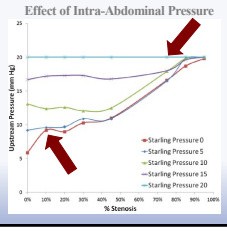


- Arterial concepts of critical stenosis do not apply
  - Arterial – Reduction if *downstream pressure / flow*
  - Venous – Elevation of *upstream pressure*
- Complex determinants of upstream venous pressure
  - Degree of stenosis
  - Inflow volume (rest vs exercise)
  - Starling (intra-abdominal) pressures
  - Outflow (right atrial) pressure

Can We Even Define A Critical Venous Stenosis?

Raju S, J Vasc Surg: Venous and Lym Dis 2014

Upstream pressure is determined by the dominant component (components are not additive)



Clinical Judgement Matters

Indications for Stenting

Conclusions

- Significance of thrombotic lesions easier to predict than non-thrombotic
- Improved diagnostic criteria are desperately needed
- Clinical stenosis is variable at best and likely is location threshold
  - Most non-thrombotic lesions are asymptomatic
  - IVUS identified lesions are dynamic (restriction, position)
  - C4 – C6 disease
    - Bilateral edema
    - Most edema may be multifactorial in etiology
  - C5 – 6 disease

THIS IS NOT A COOKBOOK

Appropriate use requires integration of sound clinical judgement with less than definitive imaging findings