

**NYU Langone Health**

# DEEP VENOUS REFLUX IN PATIENTS UNDERGOING VENOUS TREATMENTS

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## Disclosures

- Boston Scientific – Consultant
- BD – Consultant
- enVveno – Investigator

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## Landscape

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## Interplay between systems

- DVR + Stenting + Ablation
  - Is it safe to stent?
  - Is it safe to ablate?
  - Thrombotic risk?
  - Symptom improvement OR degradation?
  - Does prognosis change?
  - Dancing around the topic...but may be getting to answers

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## Incidence

Prevalence of deep venous reflux in patients with primary superficial vein incompetence

Nicola Labropoulos, PhD, Apostolos K. Tsoupridis, MD, Harris S. Kang, MD, M. Ashraf Memon, MD, Fred N. Litwin, MD, and William H. Baker, MD, *Microvasc Res*

- Labropoulos et al., JVS, 2000
  - 22% of pts with superficial reflux exhibited femoral or popliteal reflux
  - Mainly segmental in the CFV, short duration (mean 0.9s), associated with junctional reflux
- Raju et al., JVS, 2010
  - In 528 limbs with obstruction and reflux
  - Non-thrombotic (37%), post-thrombotic (54%), combined (9%)
  - Patients improved
  - Reflux parameters did not deteriorate after stenting
  - 5 needed DVR procedure

Unexpected major role for venous stenting in deep reflux disease

Sebahati Raju, MD, Rishi Davey, BS, and Peter Neglitz, MD, PhD, *J Vasc Med Biol*

CIVIQ categories	Pre-stent	Post-stent	P value
Pain	4 (1-5)	3 (1-5)	<.0001*
Work	4 (1-5)	3 (1-5)	<.0001*
Sleep	3 (1-5)	2 (1-5)	.0002*
Steady	3 (1-5)	2 (1-5)	<.0001*
Moore	2 (1-3)	2 (1-3)	.002*
Total	68 (20-100)	53 (20-100)	<.0001*

\*There was a significant improvement in all five categories.

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## Systematic review

Review: J Vasc Surg Venous Lymphat Disord. 2022 Jul 10;6(9):945-954.e2. doi: 10.1016/j.jvsv.2021.12.007. Epub 2022 Jan 20.

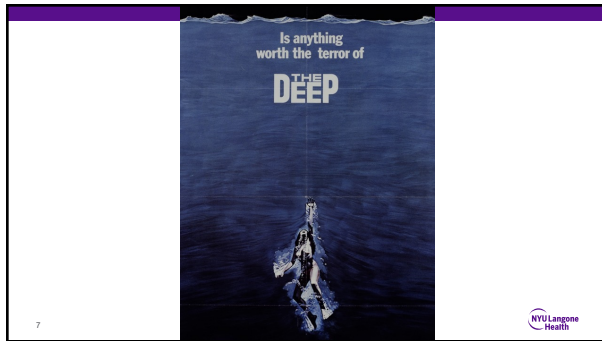
Bright Sander<sup>1</sup>, Eric K Pedem<sup>2</sup>

### A systematic review of management of superficial venous reflux in the setting of deep venous obstruction

- Try to glean information from literature
- 10 retrospective series
- Concurrent DVR present in 12% - 81% (in seven studies)
- 2476 limbs in 2428 patients
- Combined disease did better with stenting + ablation
- Unclear...but DVR did not seem to change outcomes

# DEEP and SUPERFICIAL

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### Relationship between iliofemoral venous stenting and femoropopliteal deep venous reflux

Matthew Pergamo, MD, Lowell S. Kabnick, MD, Glenn R. Jacobowitz, MD, Carol B. Rockman, MD, Thomas S. Malbrain, MD, Todd L. Berland, MD, Sheila Blumberg, MD, and Mikael Sadek, MD, New York, NY

#### Stenting and DVR

- JVS-VL, 2022
- Retrospective review, 2012-2020
- 275 patient limbs that underwent iliofemoral venous stenting
- Average follow-up of 24 months
- Evaluate resolution of DVR following stenting

**Table I. Significant demographic data**

Variable	Preoperative DVR		P value
	No (n = 217)	Yes (n = 58)	
Age, years	55	57	.84
Female gender	149 (68.7)	26 (44.8)	<0005
BMI, kg/m <sup>2</sup>	29.4	30.3	.53
History of DVT	37 (17.1)	39 (67.2)	<0001
Phleboma ablation	86 (39.6)	35 (60.4)	.007

BMI, Body mass index; DVR, deep venous reflux; DVT, deep vein thrombosis. Data presented as number (n), unless noted otherwise.

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#### DVR Outcomes

- DVR
  - 17/51 (33%) resolved
  - C6 (24.5% → 13.3% of total cohort)
- No DVR
  - 6/206 developed DVR post-stenting

**Table II. Significant outcomes**

Outcome	Preoperative DVR		P value
	No (n = 217)	Yes (n = 58)	
Postoperative DVR	6/206 (2.9)	34/51 (58.6)	.0497
Second intervention	14/215 (6.4)	5/57 (8.6)	.56
Mean follow-up, days	719	748	.78

DVR, Deep venous reflux. Data presented as n/total (n), unless noted otherwise. \*Follow-up imaging studies not available for 11 patients, and data for second intervention not available for 2 patients. \*\*Follow-up imaging studies not available for seven patients, and data for second intervention not available for one patient.

### Additional supporting data

- Tolerance in spite of reflux
  - 1379 limbs with DVR + stenting
  - 21% resolution of DVR at femoral vein
  - Tolerate residual reflux well
  - Same clinical outcomes
- Maintained long-term
  - 1387 limbs in 1228 patients
  - Duplex and hemodynamic reflux resolution using all measure

**Clinical tolerance of untreated reflux after iliac vein stent placement**

Talmur Sabem<sup>1</sup>, Michael Lucas<sup>2</sup>, David Thaggard<sup>3</sup>, Hunter Peoples<sup>4</sup>, Cooper Luke<sup>5</sup>, Sarahall Egan<sup>6</sup>

**Long-term improvement of limb reflux prevalence and severity after iliac vein stent placement**

Sarahall Egan<sup>1</sup>, Michael Lucas<sup>2</sup>, Cooper Luke<sup>3</sup>, Hunter Peoples<sup>4</sup>, Talmur Sabem<sup>5</sup>, Ajay Jayak<sup>6</sup>



### Effect of concomitant deep venous reflux on truncal endovenous ablation outcomes in the Vascular Quality Initiative

Craig S. Brown, MD, Nicholas H. Osborne, MD, MSc, Gloria Y. Kim, MD, MPH, Danielle C. Sutzko, MD, MSc, Thomas W. Wakefield, MD, Andrea T. Ols, MD, and Peter K. Henke, MD, Ann Arbor, Mich

#### National VQI

- Brown et al., JVS-VL, 2021
- Varicose Vein Registry (VVR)
- 4881 patients, 2254 (46.2%) with combined deep and superficial reflux
- VCSS, Total symptom score both improved significantly
- Counseling is critical, re: complications

**Fig 2. Comparison of total symptom score as well as Vascular Clinical Severity Score (VCSS) among patients with and without deep reflux. A, Total symptom score vs VCSS in the preoperative and postoperative periods. B, Total symptom score vs VCSS in the preoperative and postoperative periods.**

**Fig 3. Comparison of complication rates among patients with and without deep reflux. A, Individual procedural specific complication rates and B, overall procedural specific complication rates. P values of less than .05 are indicated by asterisks. VCSS, Vascular Clinical Severity Score; VVR, Varicose Vein Registry.**

NYU VQI

Superficial venous procedures can be performed safely and effectively in patients with deep venous reflux

Chong JJ<sup>1</sup>, Glenn B, Jacobowitz<sup>2</sup>, Carson B, Buckman<sup>3</sup>, Thomas S, Malhotra<sup>4</sup>, Sobel L, Berland<sup>5</sup>, Karen Garg<sup>6</sup>, Michael Barfield<sup>7</sup>, Mikal Sadek<sup>8</sup>

- JVS-VL, 2022
- Assess if our experience was comparable to national data?
- Additional chart review to assess contemporary effects on DVR
- 7812 limbs, 644 (7.6%) with combined deep and superficial reflux

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Reflux persistence or resolution

- DVR resolution → 40.8% of limbs
- DVT/EHIT → 2% vs. 1.2%, P = 0.215

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Conclusions

- DEEP**
  - DVR may improve post-stenting
  - Patient symptoms may improve post-stenting
  - In the small cohort where DVR develops, clinical significance is unclear
- SUPERFICIAL**
  - DVR may improve post ablation
  - Patients do better with ablation treatment
  - Patient counseling is important (EHIT/ARTE/DVT)

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THANK YOU

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