How to select patients with deep venous intervention vs. superficial venous intervention in severe venous disease

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Disclosure

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

- No guidelines
- No direct comparison of 2 approaches
- Limitations
  - Study design (?)
- Common Sense

My Practice

- Experience – Decade + of dealing with severe CVI (C4-C6 – 50-60% of referrals)
Deep first ..... ok
But....
CONCLUSION

The evolving basis for management of patients with chronic venous disease is to accurately verify and classify the presence of venous dysfunction. The initial treatment in symptomatic patients must take into account the degree and distribution of valve reflux and outflow obstruction. It seems logical to initially perform minimally invasive percutaneous stenting and saphenous ablation rather than open surgery in patients with venous outflow obstruction and superficial reflux. These interventions do not exclude simultaneous nonoperative treatment such as compression therapy, which if accepted by the patient, may be seen as complimentary.
Ehrich WE, Krumbhaar EB. A frequent obstructive anomaly of the mouth of the left common iliac vein. *Am Heart J.* 1943; 26:737–750.

Ilio-caval obstruction consult
Interventions - Not entirely benign

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Superficial first....

Relatively safe

But, can’t ignore the PATHOLOGIC deep obstruction
Effect of treating superficial reflux in CVI

- Aggressive treatment of superficial venous system results in complete reversal of deep venous reflux at CFV in > 80% - 100% of patients

- Knipp, Wakefield; Chapter 35, Pg 450; Vascular Surgery: Therapeutic Strategies; Mark K. Eskandari et al
How often is deep venous reflux eliminated after saphenous vein ablation?

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Background and Purpose: Deep venous reflux resolution after great saphenous vein surgery has been reported, but the studies evaluated mainly patients with deep segmental reflux. We prospectively analyzed the effects of greater saphenous vein ablation on coexisting primary deep axial venous reflux compared with segmental venous reflux.

Patients and Methods: Between February 1997 and June 2001, patients with primary deep venous reflux scheduled for greater saphenous vein surgery were included in the study. Limbs of patients with a history of deep venous thrombosis, thrombophlebitis, trauma, and orthopedic or venous surgery were excluded. After surgery, duplex scanning was repeated and patients were examined for persistent deep venous reflux.

Results: Thirty-three patients (38 limbs) were followed up with duplex scanning. Follow-up ranged from 2 weeks to 38 months. Preoperative axial deep reflux was present in 17 extremities, and segmental reflux was present in 21. The total number of incompetent segments was 59. Overall reflux abolishment rate was similar in extremities with axial and segmental reflux (30% vs 36%; P > .08). When segments were analyzed individually, abolishment of superficial femoral vein reflux was observed more often in extremities with segmental reflux than those with axial reflux (odds ratio, 4). In the extremities where deep reflux was not abolished with greater saphenous vein ablation, degree of reflux did not change significantly (P > .1). Duplex scanning was performed more than once during follow-up in 9 patients. In 3 of these patients reflux resolved by the second follow-up evaluation, and in 2 reflux was decreased at the second and third follow-up evaluations.

Conclusion: In patients with concomitant deep and superficial venous reflux, saphenous vein ablation results in resolution of deep reflux in about a third of patients. Superficial femoral vein reflux is seldom corrected in limbs with axial reflux compared with those limbs with segmental reflux. To appreciate the effects of greater saphenous vein ablation, longer follow-up may be needed. (J Vasc Surg 2003;38:517-21.)

Table IV. Comparison between preoperative and postoperative reflux among segments in extremities with preoperative segmental reflux

<table>
<thead>
<tr>
<th>Preoperative reflux</th>
<th>Postoperative reflux</th>
<th>Elimination rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFV</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>DFV</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>PV</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>14</td>
</tr>
</tbody>
</table>

“Saphenous vein ablation results in resolution of deep reflux in about a third of patients”
Endovenous laser ablation: Venous outcomes and thrombotic complications are independent of the presence of deep venous insufficiency

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**Objective:** We hypothesize that endovenous laser ablation (EVA) therapy is equally successful in improving venous insufficiency symptoms in patients with or without deep venous insufficiency (DVI).

From January 2005 through August 2007, EVA of the great saphenous vein (GSV) was attempted in 364 symptomatic patients. The GSV was successfully cannulated and obliterated in all but 17 limbs (69.5%) and with phlebectomy or perforator ligation (EVAP) in 135 limbs preoperatively and at 30, 90, 180, and 360 days postoperatively. These outcomes are independent of the presence of DVI. Finally, the use of a risk-adjusted thrombosis prevention protocol had no effect on the rate of superficial thrombus extension from EVA or EVAP in patients undergoing general anesthesia. (J Vasc Surg 2008;48:1538-45.)
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

Stent Vs Ablation Vs Wound Care
History, History, History

- 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”
History, History, History

Prolonged hospitalizations (Undiagnosed DVT) – Can we be sure that scarring is “NIVL”? ...

Remote IVDA

Bilateral Hernia repairs
Old axial scans
Physical Exam

Abdominal and pubic collateral veins as indicators of deep venous obstruction

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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.)
Non-Saphenous/ Pelvic Varicosities
Duplex

- Venous insufficiency test
  - Deep Vs Superficial Reflux
  - Chronic fibrosis of deep veins
- Evidence of deep vein obstruction
  - SEV reversal
  - Flow pattern – side to side
- Pelvic duplex
Poor Augmentation

Lack of phasicity

SFJ Tributaries

- **SE** – Superficial Epigastric (Land mark for ablative therapies)
- **SEP** – Superficial External Pudendal
- **SCI** – Superficial Circumflex Iliac

*J Vasc Surg 2002;36:416–422*
A novel duplex finding of superficial epigastric vein flow reversal to diagnose iliacaval occlusion
Kolluri et al; Accepted in JVS Venous and Lymphatic
Pelvic Duplex

[Image of ultrasound scans showing pelvic structures]
Pelvic Duplex
CVI

History and Physical

Venous Insufficiency test +/- Pelvic Duplex + SEV reversal

Recent Axial Imaging with Ilio/Caval abnormalities

Yes

CTV/ MRV (Based on Hx and concern)

IVUS / Angio/ Revasc + Non-Inv Rx of eczema/edema & Wound care

No

History “benign” Venous Insufficiency test – Superficial reflux only

Superficial treatment + Non-Inv Rx of eczema/edema & Wound care

No Improvement in 3-6 months
Tunnel

- Neuropathy – 10-15% per year
- NCS/EMG
- Cancers
- Other etiologies

Elevated Central Venous Pressure

Atrophie Blanche - Livedoid Vasculitis
Simple Decision Making

• Signs/ Symptoms + or Cosmetic improvement
• GSV/SSV reflux
• GSV/SSV anatomy – Straight, adequate depth and no tributary reflux

Ablation +/- Compression Rx
• 53 yr old male with bilateral ankle ulcers

• Left GSV ablation last yr did not help
  GSV Reflux, proximal aneurysm

IVC Atresia, Iliac veins absent, prominent Azygous / Hemiazygous

Deep Vein Reflux
“Physiologic reversal” of perforator into a competent AASV
How to select patients with deep venous intervention vs. superficial venous intervention in severe venous disease

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