Chronic Venous Disorder & Recurrence: Deep, Superficial and Perforator Reflux Diagnosis and Management

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Disclosures

No pertinent disclosures
Chronic Venous Disorder

Mostly referring to PRIMARY Varicose vein disease
  ■ *(incompetent type)*

Will briefly mention Post-thrombotic Syndrome
  ■ *(obstructive type)*
Abbreviations/Nomenclature

FV = Femoral Vein (replaces superficial femoral vein)
GSV = Great saphenous vein (replaces Greater or Long)
SSV = Small saphenous vein (replaces Short or Lesser)
AASV = Anterior accessory saphenous vein (replaces lateral)
PASV = Posterior accessory saphenous vein
SFJ = Saphenofemoral Junction
SPJ = Saphenopopliteal Junction
VTE = Venous Thrombo Embolic (encompasses DVT, PE, SVT)

Know “new” terms for perforators
CVD-Varicose Veins

- Importance & Impact
- Presentation
- Diagnosis
- Treatment
- Etc. (special circumstances, complications, etc.)
IMPORTANCE OF VENOUS DISEASE

- It is estimated that 20% of American women and 7% of American men suffer from venous disease.
- Venous disease results in symptoms such as aching, fatigue, swelling, and pain in the legs that can interfere with daily living.
- Cosmetic issues may affect quality of life.
- At least 20% of patients with venous disease (namely GSV reflux) will develop leg ulcers.

Varicose veins—Impact
Venous Ulcers

- Many take > 9 months to heal
- Up to 66% last > 5 years
- Affect 1% general population w/ annual healthcare cost of $1 billion (US)

CVD-Varicose Veins

- Importance & Impact
- Presentation
- Diagnosis
- Treatment
- Etc. (special circumstances, complications, etc.)
Presentation: Symptoms attributable to CVI

1. Aching
2. Tiredness, leg fatigue, leg heaviness
3. Discomfort: throbbing, burning, stinging
4. Cramping: post-exercise or nocturnal
5. Itching
6. Restless Legs
7. Symptoms worse with prolonged standing, menses, or prolonged car travel
Presentation:

Signs attributable to CVI

1. ↑↓ Swelling or ankle edema
2. Dilated veins, venules, telangiectasia
3. Corona phlebectatica
4. Pigmentation changes ↑ or ↓
5. Venous dermatitis
6. Atrophie blanche
7. Ulcerations
But MANY times, the main reason for the visit:

COSMETIC APPEARANCE
CVI skin changes

**Widmer Stage 1**, corona phlebectatica

**Widmer Stage 2**, hyper- or hypopigmentation

**Widmer Stage 3**, ulcer
CVD-Varicose Veins

- Importance & Impact
- Presentation
- Diagnosis
- Treatment
- Etc. (special circumstances, complications, etc.)
CVD-History

- **General:**
  - Allergies
  - PMHx: DM, PAD, arthritis, back pain, migraines, cardiac,
  - Hx of VTE: beware of “blood clot” history
    - Provocation, treatment, duration of tx, etc.
  - Social history: smoking and occupation (standing)
  - Medications: those associated with edema or hypercoagulability (tamoxifen, hormones)
  - FHx: of the above, esp. VV or VTE
CVD-History

- Absolutely essential components:
  - Discuss leg symptoms: worse, better.
  - Symptoms altered by menses or post-coital?
  - Previous VTE or superficial thrombophlebitis
  - Previous intervention
    - Vein “stripping”, true ligation, division, and removal of saphenous vein
    - Phlebectomy
    - Catheter-based ablations (length of treated vein), etc
    - Injection sclerotherapy
CVD-History

Detailed (working w/ vein center/phlebologist)

- Previous DVT or superficial thrombophlebitis: location, tx
- Previous intervention
  - Treatment of the junction
    - None
    - Flush ligation
    - Distal ligation preserving terminal valve and superficial epigastric
    - Repeat for recurrence, foam sclerotherapy, etc.
  - Treatment of the main trunk
    - None
    - Ablation (length)
    - Stripping (length)
CVD-History

Detailed cont’d

- Treatment of tributaries (concomitant vs delayed)
  - None
  - phlebectomies
  - Sclerotherapy (foam or liquid)
  - Catheter ablations

- Treatment of perforating veins
  - None
  - Ablation
  - Ligation (epifascial vs subfascial i.e. SEPS)
  - Sclerotherapy (foam or liquid)
Diagnosis

History & Physical Exam

- Vascular directed history w/ attention to VV and VTE personal & family history
- OB-GYN & medication history vital
- Use VCSS and patient reported outcome measures
- Standing physical exam should be performed to allow maximal vein distention.
- Visual inspection & palpation of all skin & tissue to include gaiter regions and abdomen.
- As always, check pulses!
Diagnosis
Testing & Imaging

- CW Doppler
- Plethysmography
  - PPG
  - APG
- Ascending & descending venograms
- MRI/MRV
- Standing venous duplex
Diagnosis
PPG

FIG. 5.7
Normal PPG Tracing
Diagnosis

APG

Less common, more complicated and more operator dependent: nonetheless can give additional information. May be of particular use in determining if a varicose vein in a patient w/ previous DVT or chronic obstruction is functioning as major outflow tract.
Diagnosis

Other imaging modalities

- CT
- CTA/CTV
- MRI
- MRV
- Venography
- Vascular malformations
- Pelvic pathology/mass
  - Pelvic Congestion Synd.
- Iliac vein compression
Standing Venous Duplex
**Indications**

1. Evaluation of leg discomfort and/or swelling
2. Pre-operative (VV/CVI +/- ulcers)
3. Post-operative (VV/CVI +/- ulcers)
4. Changes in signs or symptoms
5. Surveillance*

*Not validated*
Varicose vein “sources of reflux”

- Junctional
  - GSV (SFJ)
  - AASV (SFJ)
  - SSV (SPJ)
- Perforators
- Pelvic
  - Internal iliac
  - Gonadal
Venous Duplex

- **Supine Duplex**
  - Assess for patency of deep system
    - CFV
    - FV
    - Popliteal vein

- **Standing Duplex**
  - Assess size and function of superficial system
  - Determine source of reflux
  - Determine status of perforating veins
# Standing Reflux Exam

**Patient History**
- Smoking: Y/N
- Diabetic: Y/N
- DVT: Y/N
- CVA or TIA: Y/N
- Previous Vascular Surgery

**Indications for Exam**
- Venous reflux
- Previous DVT

**Findings**
- Ulcerated varicose veins
- Standing venous reflux
- Neg for acute DVT
- Pos for reflex
Examples

- Potential sources of reflux:
  - AASV
  - Pudendal
  - Posterolateral thigh perforator (Hach’s perforator)
  - May also have GSV involvement too!
Eliciting the Reflux

Essential to create adequate pressure gradient!!

- **Valsalva**
  - Attempts at standardizing involve devise using forced expiration

- **Compression and release**
  - Hand squeeze
  - Rapid cuff deflator
Eliciting the Reflux
Essential to create adequate pressure gradient!!

- Rapid cuff deflator
  - Typically placed on the proximal calf, BUT ideally should be placed over the “reservoir”

A Comparison of the Cuff Deflation Method With Valsalva’s Maneuver and Limb Compression in Detecting Venous Valvular Reflux

Arie Markel, MD; Mark H. Meissner, MD; Richard A. Manzo, CCVT; Robert O. Bergelin, MS; D. Eugene Strandness, Jr, MD

Arch Surg. 1994;129(7):701-705
Duplex Testing-Exam

- Lipodermatosclerosis – Severe Venous Hypertension

Frequently “harder” to elicit reflux due to tissue fibrosis
Significant Findings - Perforator
Significant Findings - Perforators

Right GSV BK Mid

W/ MULTIPLE VV

AND PERFORATOR

Dist 0.370 cm
Dist 0.406 cm
Standing venous exam

Areas of concern or sources of errors

1. Position of body (Standing or tilt-table)
2. Position of cuff
3. Time of day?
4. Use of stockings day of testing?
5. Patterns of veins and likely suspects
6. Tech experience and willingness to look
Examples
Examples
Posterolateral thigh perforator (Hach’s) connects to Profunda Femoral Vein
CVD “Diagnosis”, now, . . .

**Basic CEAP = C6**

**Basic** $C_{2,3,4a,6s} E_s A_{s,p,d} P_{r,o}$

**Advanced =**

$C_{2,3,4a,6s} E_s A_{s,p,d} P_{r2,3,13,18,07}$

**Level III (CT) 3/28/15**
Diagnosis Reporting

- VCSS
- Validated
- To use in conjunction with CEAP
- Separate scores for each leg
- Used to follow longitudinally

### TABLE 4.2

<table>
<thead>
<tr>
<th>Component</th>
<th>Mild(1)</th>
<th>Moderate(2)</th>
<th>Severe(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain/discomfort</td>
<td>occasional</td>
<td>daily</td>
<td>daily, limits activity</td>
</tr>
<tr>
<td>Varicose veins (3 mm diameter)</td>
<td>few, or coronal phlebothica</td>
<td>call or thigh</td>
<td>call and thigh</td>
</tr>
<tr>
<td>Venous edema</td>
<td>foot and/or ankle</td>
<td>above ankle to knee</td>
<td>knee and above</td>
</tr>
<tr>
<td>Pigmentation</td>
<td>perimalleolar</td>
<td>diffuse, lower 1/3 call</td>
<td>wider, above lower</td>
</tr>
<tr>
<td>Inflammation</td>
<td>perimalleolar</td>
<td>diffuse, lower 1/3 call</td>
<td>1/3 call</td>
</tr>
<tr>
<td>Induration</td>
<td>perimalleolar</td>
<td>diffuse, lower 1/3 call</td>
<td>wider, above lower</td>
</tr>
<tr>
<td>Active ulcer (number)</td>
<td>1</td>
<td>2</td>
<td>&gt;3</td>
</tr>
<tr>
<td>Active ulcer (longest duration)</td>
<td>&lt;3 months</td>
<td>3-12 months</td>
<td>&gt;12 months</td>
</tr>
<tr>
<td>Active ulcer size</td>
<td>&lt;2 cm, diameter</td>
<td>2-6 cm, diameter</td>
<td>&gt;6 cm, diameter</td>
</tr>
<tr>
<td>Compressive therapy</td>
<td>intermittent</td>
<td>most days</td>
<td>fully compliant</td>
</tr>
</tbody>
</table>
CVD-Varicose Veins

- Importance & Impact
- Presentation
- Diagnosis
- **Treatment**
- Etc. (special circumstances, complications, etc.)
CVD-Treatment

- Indications:
  1. Cosmetic
  2. Treat complications
  3. Prevent complications
Treatment of Varicose Veins

Intervention indications:

- **Appearance**
  - Lipodermatosclerosis
- Pain
  - Atrophie blanche
- Leg heaviness
  - Ulceration
- SVT
- VV bleeding
- Hyperpigmentation
Indications are “dynamic”
CVD-Treatment Options

1. Nothing.
   - explain to patient about “Natural history”

2. Conservative.
   - Analgesics, stockings, etc.

3. “Surgery”
   - Stripping, phlebectomy, etc.

4. Endovenous Thermal Ablation
   - RF, laser, steam

5. Sclerotherapy
   - Injection, laser, cyanoacrylic glue, combined mechanical-chemical
Chronic Venous Disorder & Recurrence
Deep, Superficial and Perforator Reflux
Diagnosis & Management

- **Diagnosis**
  - History w/ severity scores
  - Standing Physical Exam
  - Standing venous duplex
  - Look for the usual “sources”
    - Junctional
    - Pelvic
    - Perforator

- **Treatment Alternatives**
  - Endovenous ablations
  - Foam Sclerotherapy
  - Stripping, ligations
  - Phlebectomy
  - Previous clot (deep or superficial) raises the complexity
  - Previous treatment raises the complexity
**Varicose Vein Treatments**

**Special circumstances**

- **DVT**: Unless deep system is OCCLUDED, history of DVT is NOT a contraindication to treatment of VV. Look at the iliac veins if symptoms > leg exam.

- **Venous Ulcers**: Routine surgery or ablation not recommended but ablation of reflux may improve healing and does decrease recurrence.\(^1\) (ESCHAR trial)

- **REVAS: Recurrent Varices After Surgery**
  - May be has high as 77% (34 year follow-up)\(^2\)

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Varicose Vein Recurrence

REVAS: Recurrent Varices After Surgery

- Reported at 6.6-37% @ 2 years, 51% @ 5 years\(^1\)
- Reasons:
  - Technical errors
  - Tactical errors
  - Neovascularization,
  - Progression of disease
- Sources:
  - SFJ reflux into another vein (i.e. AASV)
  - Perforator reflux
  - Technical failure
  - Unknown (pelvic reflux), combination

CVD-Varicose Veins

- Importance & Impact
- Presentation
- Diagnosis
- Treatment
- Etc. (a few special circumstances)
Significant findings - Asymmetry
Significant Findings – Pulsatile Flow
Endovenous Heat Induced Thrombosis (EHIT)
Muscle fascia herniation

- Frequently confused with varicose veins
- Usually found on the lateral calf
- Bulge disappears with dorsiflexion of the foot
- No venous flow is audible with continuous-wave Doppler examination
VV associated with other skin lesions or limb enlargement
Beware of Varicose veins in unusual places

Chronic occlusion of LT CIV & EIV

VV in LT arm secondary to subclavian Vein occlusion (pacemaker)
CVD-Conclusion

- Importance & Impact
- Presentation
- Diagnosis
- Treatment
- Etc. (special circumstances, complications, etc.)
Chronic Venous Disorder & Recurrence: Deep, Superficial and Perforator Reflux
Diagnosis and Management

Thank you.