Treatment of Venous Disease

Tim Gardner MD, FACC
Bryan Heart

Boy, Have I missed The Boat

These are NOT the legs I work with!
My World

Venous Ulcer due to Chronic Venous Insufficiency, CVI

Venous Disease is the Most Common Vascular Disorder
Prevalence of Venous Disease

- Abnormal venous anatomy:
- Varicose veins
  - 15% of males & 30% of females
  - Standing vocation
  - Leg injury or surgery
  - Familial tendency
  - Associated with pregnancy
  - Generally progressive

Prevalence of CVI by Age and Gender

<table>
<thead>
<tr>
<th>Age</th>
<th>Female</th>
<th>Male</th>
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</thead>
<tbody>
<tr>
<td>20-29 yrs</td>
<td>8%</td>
<td>1%</td>
</tr>
<tr>
<td>40-49 yrs</td>
<td>41%</td>
<td>24%</td>
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<tr>
<td>60-69 yrs</td>
<td>72%</td>
<td>43%</td>
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Venous Physiology in the Legs

- Rich network of veins that course between the calf muscles
- Walking or standing causes contraction of these muscles, compressing the veins, forcing venous return to the heart
- Relies on competent one way valves, and normal vein caliber throughout the venous system of the leg
- Reduces venous pressures while augmenting return to the heart
CVI is a Progressive Disease
Anatomy of the Venous System

Venous Return

90-95% venous return through the deep system

5-10% through the superficial system

50% of pts with venous ulcers are due to incompetency of the deep veins

Conservative measures only
**Chronic Venous Insufficiency**

Chronic high pressures in the venous system
Fluid leaks into perivascular space, causing edema with increased pressures and inflammation, involves macro and micro circulation (capillaries)
RBCs leak into the perivascular space causing hemosiderin deposits-dermal darkening
Inflammation and ischemia, poor oxygen delivery to dermis
Ulceration, poor healing

**Sites of Involvement**

![Images of blood flow and affected areas]

**Arterial Insufficiency**

![Images of foot and blood flow]
**Sources of Reflux in Venous Ulceration**

- 79% superficial reflux
- 63% perforator reflux
- 50% deep reflux

**Diagnosis**

Venous duplex ultrasound with tilt table is the gold standard
- Pt supine and standing ideal, can use reverse trendelenberg
- Measure vein size and degree of reflux
- Assess for DVT

**Sequellae of Venous Insufficiency**

- Edema
- Chronic pain, fatigue, restless legs
- Dermal discoloration
- Cellulitis
- Poor healing and recurrent leg ulcers
- Superficial venous thrombophlebitis
- DVT
- Pulmonary Embolism
- Limb Loss
underlying problem, not just the wound!!

Treatment
Conservative
Surgical
Endovascular

Yikes!
**Conservative Treatments**

- Leg elevation
- Compression stockings
- Exercise
- Weight loss
- Decrease vein size and increase venous return, thus decreasing venous pressure

High recurrence rates

NOTE: These treatments do not address the underlying condition – venous reflux

Patient compliance is low

**Surgical and Endovascular Treatment**

Goal is to stop venous return in the diseased vein, redirecting flow into the deep system

Remember: 90-95% deep, 5-10% superficial

Reducing venous insufficiency and venous pressures

Either remove the vein or ablate

**Saphenous Vein Stripping**
Limitations of Traditional Surgical Therapy

- Invasive
- Painful
- Prolonged recovery
- Cosmetic

Radiofrequency Ablation

- Ablate the vein, closing it
- No venous blood flow, flow redirected to deep veins
- Vein not removed from body
ClosureFast
7 cm heating element
Temperature-controlled energy delivery

Endothermal Venous Ablation
Minimally invasive alternative
Saphenous veins and perforators, Catheter-based approach to deliver radiofrequency energy to vein wall
Energy contracts vein wall collagen, thus occluding the vein

Energy Delivery/Treatment
Disposable catheter inserted into vein
Vein heats and collapses
Catheter withdrawn, closing vein
**Venoablative Treatment**

- Minimally invasive, mild sedation
- Low complication rate
- No discomfort
- Quick recovery
- Excellent long term results

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**Results of Successful Treatment**

- Improved hemodynamics
  - Increase O₂ delivery to ischemic tissue
  - Enhance healing
  - Normalization of tissue color
- Relief of symptoms
- Improved appearance-expectations
- Enhance quality of life

**HAPPY PATIENTS 😊**

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**Before & After**

- Non-healing ulcer healed 8 weeks after Closure Procedure

*Images courtesy of Dr. David McMillan*
In Summary

Venous disease is the most common cardiovascular disease
Often overlooked
Can lead to disabling outcomes
Traditional treatment is sub optimal
Venoablative therapy is an excellent option with little discomfort, low complication rate and great long term results

Thanks!