Summary

- History
- Indication
- Contraindications
- Risks
- Procedure
- What to watch out for
- Tips & Tricks
- Results
- Post Op/Follow Up
In the past…

- **Surgical ligation & stripping**
  - Required general anesthesia or epidural
  - A/w high incidence of perioperative morbidity
  - A/w high incidence of varicose vein recurrence
    - 6.6-37% at 2 years
    - up to 51% at 5 years
  - Groin neovascularization common after GSV treatment

Newer technique

- **Endovenous thermal ablation (EVTA)**
  - Percutaneous procedure using radiofrequency or laser energy
  - Endothelial damage → fibrotic & thrombotic occlusion of the veins
  - Outpatient procedure, local tumescent anesthesia, clinically superior to surgery
    - less post op pain & down time
    - better success rates
Endovenous Laser Ablation (EVLA)

- Recommended for GSV, SSV, accessory saphenous, intersaphenous & perforating veins.
- Hemoglobin specific laser wavelengths 810, 940, 980, 1064nm
- Water specific wavelengths of 1320, 1470, 1510nm (vein wall or blood cell)
  - Less bruising & pain
  - Water chromophore more efficient for energy absorption vs Hgb (40x), lower total energy levels needed

Indications

- Treatment of symptomatic GSV or SSV reflux unresponsive to conservative treatment to
  - 1) Relieve symptoms
  - 2) Improve the severity of the underlying reflux & venous hypertension
  - 3) Reduce the risk of developing complications a/w chronic venous disease
**Indication**

**Varicose Vein Ablative and Stripping Procedures**

Radiofrequency ablation, endovenous laser ablation, Stripping, Ligation and excision of the Great Saphenous Vein and Small Saphenous Veins are considered reconstructive, proven and medically necessary when ALL of the following criteria are present:

- **Junctional Reflux:**
  - Ablative therapy for the Great Saphenous Veins or Small Saphenous Veins only if Junctional Reflux is demonstrated in these veins; or
  - Ablative therapy for Accessory Veins only if anatomically related persistent Junctional Reflux is demonstrated after the Great Saphenous Veins or Small Saphenous Veins have been removed or ablated.

- **Individual must have one of the following functional impairments:**
  - Skin ulceration; or
  - Documented episode(s) of frank bleeding of the Varicose Vein due to erosion of/or trauma to the skin; or
  - Documented Superficial Thrombophlebitis or documented Venous Stasis Dermatitis; or
  - [Moderate to Severe Pain](https://www.google.com/search?client=firefox-b-1-d&q=united+health+care+endovenous+laser+ablation) causing Functional or Physical Impairment.

- **Venous Size:**
  - The Great Saphenous Vein must be 5.5 mm or greater when measured at the proximal thigh immediately below the saphenofemoral junction via Duplex Ultrasonography.
  - The Small Saphenous Vein or Accessory Veins must measure 5 mm or greater in diameter immediately below the appropriate junction.

- **Duration of reflux:** in the standing or reverse Trendelenburg position that meets the following parameters:
  - Greater than or equal to 500 milliseconds (ms) for the Great Saphenous vein, Small Saphenous Veins or principle tributaries.
  - Perforating veins > 350 ms.
  - Some Duplex Ultrasound readings will describe this as moderate to severe reflux which will be acceptable.
Contraindications

- Superficial vein thrombosis
- Deep vein thrombosis
- Tortuous GSV on duplex exam
- Advanced peripheral vascular disease
- Severe systemic disease
- Hypercoagulable or bleeding disorders
- Local or systemic infection
- Immobility
- Pregnancy or breastfeeding
Contingencies

- High ligation & stripping recommended for
  - Large VV immediately underneath skin
  - Aneurysmal dilatation of SFJ
Risks

- Complication rates are lower than conventional surgery
- DVT
- Pulmonary embolus
- Vessel perforation
- Phlebitis
- Lymphedema
- Neovascularization
- Paresthesia
- Hematoma
- Infection
- Hyperpigmentation
- Skin burn
- Pain

Table II. Complications after endovenous laser therapy and radiofrequency ablation of the great saphenous vein

<table>
<thead>
<tr>
<th>Complication</th>
<th>EVLT (%) (n = 77)</th>
<th>RFA (%) (n = 53)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary retention</td>
<td>1 (1.3)</td>
<td>0</td>
<td>0.99</td>
</tr>
<tr>
<td>Thrombophlebitis</td>
<td>4 (5.2)</td>
<td>0</td>
<td>0.15</td>
</tr>
<tr>
<td>Cellulitis</td>
<td>2 (2.6)</td>
<td>0</td>
<td>0.51</td>
</tr>
<tr>
<td>Excessive pain</td>
<td>3 (3.9)</td>
<td>3 (5.7)</td>
<td>0.69</td>
</tr>
<tr>
<td>Hematoma</td>
<td>1 (1.3)</td>
<td>0</td>
<td>0.99</td>
</tr>
<tr>
<td>Edema</td>
<td>2 (2.6)</td>
<td>1 (1.9)</td>
<td>0.51</td>
</tr>
<tr>
<td>Total</td>
<td>13 (16.8)</td>
<td>4 (7.6)</td>
<td>0.2</td>
</tr>
</tbody>
</table>

EVLT, Endovenous laser therapy; RFA, radiofrequency ablation.
Thrombus protruded into the lumen of the CFV in 3 limbs (2.3%) EVLT Using 810 diode.
**Procedure**

- Ensure room is warm
- Mark the vein prior to prepping the patient
- Lidocaine (without epinephrine)
- Gain access using hollow venous puncture needle (16-21 gauge) → guidewire → remove needle → Introducer sheath catheter placed over guide wire → remove wire → insert laser fiber (after testing that it works)
- Tumescent anesthesia
  - 500 mL NS bag: -60mL +50mL 1% lidocaine with epi + 10mL bicarb (35mg/kg)
  - Aim for 1 cm buffer around the treating vessel (proximal → distal)
- Measure 2-3 cm from SFJ
- Test fire --> start treatment, treating longer near junction
  - Typically start at 7.0 J, increasing by 0.5 J, if test fire does not produce "stickiness"
- Pull back initially 0.5mm then increase to 1.0mm ensuring catheter is removed
What to watch out for

- Tortuous veins
  - Can cause issues with access, can move more proximally or use tumescent anesthesia to manipulate the vein

- Constricted veins
  - Warm up the room
  - 2% nitroglycerin
  - Heating pad

- Laser fiber
  - Ensure you watch the laser move with the U/S to ensure it doesn’t get stuck, also check at the end to ensure the laser fiber is intact

- Catheter
  - Ensure this is removed before the laser melts the plastic
**Tips & Tricks**

- **Prevent skin burns**
  - Generous tumescent anesthesia (1-2 cm below skin surface)
  - Can push down the vein also avoiding PIH
  - Stop pressing the laser pedal before the tip is pulled out of the vein

- **Decrease DVT risk**
  - Proper placement of fiber 2 cm below junction
  - Immediate ambulation
  - Trendelenberg position to collapse veins
    - decreases blood in vein $\Rightarrow$ decrease blood coagulation $\Rightarrow$ decrease residual intramural thrombus (source of DVT/embolus)

- **Avoid Superficial Venous Thrombosis**
  - Immediate ambulation
  - Use appropriate energy

- **Avoid nerve injury (paresthesias)**
  - Generous tumescent anesthesia
  - Avoid thermal ablation of the GSV below the mid- to distal- calf, as the saphenous nerve runs in close proximity to the GSV in this location.
  - Avoid thermal ablation of the SSV lower than mid-calf level due to the proximity of the sural nerve.
EVLA occlusion rates >95% immediately after treatment; 93% at 3 yrs, 88% at 5 yrs.

Meta analysis higher efficacy for EVLA > RFA, vein stripping & UGFS.

Systematic review & meta-analysis summarized available randomized controlled trials (RCTs) of EVLA efficacy to define the differences in success rate among variations in wavelength, energy, outcome definition, & follow up period.

- The overall success rate of EVLA is high (92%)
- Commonly used parameters of EVLA (wavelength, energy) have no influence on the treatment success rate.


Post Op/Follow Up

- Ambulate immediately after (no downtime)
- Patient to wear compression stockings
  - Efficacy to improve clinical outcomes lacking, but may help symptomatically
- Avoid hot baths, jogging, heavy lifting (1-2 wks)
- Pain control: Acetaminophen 1g alternating with NSAIDS 800mg q4hr
- 4 weeks after procedure, f/u U/S
- ± Ultrasound guided sclerotherapy (UGS) at monthly intervals as needed
References

- https://www.google.com/search?client=firefox-b-1-d&q=united+health+care+endovenous+laser+ablation
Thank you