Thermal Ablation on Anticoagulated Patients: Is It Safe and Effective?

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Disclosures

• None

Background

• Extensive review of both radiofrequency and laser venous ablation procedures have demonstrated excellent treatment effectiveness and durability for each modality.

• However, there is less data regarding treatment effectiveness and durability for these procedures in patients who are also on systemic anticoagulation.

Effectiveness and Durability of Thermal Ablation

<table>
<thead>
<tr>
<th>Authors</th>
<th>Mode of Ablation</th>
<th>Number of Subjects</th>
<th>Follow up</th>
<th>% with durable ablation</th>
<th>Bleeding/complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golan and Glenn (2008)</td>
<td>RF - 1060</td>
<td>EVLA - 490</td>
<td>5 yrs</td>
<td>87%</td>
<td>98%</td>
</tr>
<tr>
<td>Christenson et al (2010)</td>
<td>EVLA</td>
<td></td>
<td>2 yrs</td>
<td>95%</td>
<td>9% (minor)</td>
</tr>
<tr>
<td>Merchant and Pichot (2005)</td>
<td>RFA</td>
<td></td>
<td>87%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharifi et al (2011)</td>
<td>RFA - 48</td>
<td>EVLA - 40</td>
<td>1 year</td>
<td>100%</td>
<td>9% (minor)</td>
</tr>
<tr>
<td>Thevenaz et al (2006)</td>
<td>EVLA</td>
<td>22</td>
<td>1 year</td>
<td>83% (vs 96% control)</td>
<td>none</td>
</tr>
<tr>
<td>Gabriel et al (2012)</td>
<td>59 gvs/ssv</td>
<td>with perf</td>
<td>72 hrs</td>
<td>100% (effective)</td>
<td>4% (minor)</td>
</tr>
<tr>
<td>Reissman et al (2011)</td>
<td>EVLA</td>
<td>12</td>
<td>8 weeks</td>
<td>100%</td>
<td>none</td>
</tr>
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</table>

Objective

To evaluate the efficacy, durability, and safety of radiofrequency (RFA) and endovenous laser (EVLA) ablation of the great saphenous and small saphenous veins to treat symptomatic venous reflux in patients on therapeutic anticoagulation with warfarin.
Methods and Definitions

- Data was collected from a single-center institution (NYU Langone Medical Center) - patients who had undergone either radiofrequency ablation or laser ablation procedures between April of 2011 and May of 2013.

92 vessels of patients on warfarin therapy at the time of endothermal ablation were selected for study. (largest to date)

This group was compared to a matched group of 124 vessels undergoing endothermal ablation in patients not on anticoagulation.

Methods

Follow-up with duplex ultrasound at 1 week post-procedure, 6 months, 1 year, and then annually.
Outcomes analyzed with Kaplan-Meier plots and log rank tests.
Results

- AC: 92 vessels in 65 patients
- Control: 124 vessels in 89 patients
- Mean follow-up: 253 days

### Table: Patient Characteristics

<table>
<thead>
<tr>
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<th>AC patients</th>
<th>Control patients</th>
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<tr>
<td>Age (years)</td>
<td>68 [26-89]</td>
<td>52 [23-77]</td>
</tr>
<tr>
<td>Male (%)</td>
<td>51</td>
<td>27</td>
</tr>
<tr>
<td>Coronary artery disease (%)</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>55</td>
<td>20</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>RF, Laser (%)</td>
<td>54, 46</td>
<td>51, 39</td>
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### Diagram: Vessels Treated

- AC: 92 vessels in 65 patients
- Control: 124 vessels in 89 patients
- Mean follow-up: 253 days

### Diagram: Indications for Anticoagulation

- Atrial Fibrillation: 52%
- DVT: 29%
- Mechanical Valve: 8%
- Other: 11%

### Diagram: Persistent Vein Ablation

- 12 mo: AC 95%, controls 99%
- Control: 124, 69, 42, 37, 31
- AC: 91, 56, 40, 31, 25
Results: Persistent Vein Ablation
Antiplatelet Therapy and Anticoagulation

Complications

- No significant hematomas
- 3 patients had DVTs within 30 days
  - 1 anticoagulated patient - popliteal vein DVT
  - 1 control patient - popliteal vein DVT
  - 1 control patient - calf vein DVT
- EHT – 2 total
  - 1 – GSV treated with laser on anticoagulation – 6 days
  - 1 – GSV treated with laser not on anticoagulation - 7 days

Discussion

- Endovenous RFA and EVLA can be safely performed in patients receiving long-term warfarin therapy
- Our experiences demonstrated a similar short and mid-term durability for radiofrequency ablation and laser therapy.
- Anti-platelet therapy does not appear to impact closure rates, consistent with prior studies (Sharifi et. al 2011)

Results Summary

- Excellent durability
  - 12 months 95% successful ablation, RF and Laser
  - 18 months: radiofrequency ablation (93% closure rate) laser therapy (83% closure rate)

Conclusions

- The frequency of vein recanalization following venous ablation procedures while on anticoagulation is not worse as compared to controls and to the expected incidence described in the literature.
- Largest study to date - thermal ablation procedures on anticoagulated patients are effective and durable up to 12 (95%) and 18 months (83-93%)
- Additional follow up ongoing for longer term durability
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<td>NYU 2016</td>
<td>RFA - 52, EVLA -40</td>
<td>82</td>
<td>18 months</td>
<td>RF-93%, EVLA-83%</td>
<td>none</td>
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## References
- Riesenman PJ, de Fritas DJ, Konigsberg SG, Kasirajan K. Noninterruption of warfarin therapy is safe and does not compromise outcomes in patients undergoing endovenous laser therapy (EVLT). *Vasc Endovasc Surg* 2011;45:324.

### Complete Follow-Up

![Complete Follow-Up Image]