Thermal Ablation on Anticoagulated Patients: Is it Durable and Effective?

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Background

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

• 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, 1006</td>
<td>1,505</td>
<td>5 yrs</td>
<td>87%</td>
<td>98%</td>
</tr>
<tr>
<td>Christenson et al (2010)</td>
<td>EVLA</td>
<td>104</td>
<td>2 yrs</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Merchant and Pichot (2005)</td>
<td>RFA</td>
<td>1,222</td>
<td>5 years</td>
<td>87%</td>
<td></td>
</tr>
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</table>

NYU Langone Medical Center Vein Center Experience
Objective

• To assess the durability and effectiveness of endothermal venous ablation – both radiofrequency ablation and laser - for patients on systemic 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.

96 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 119 vessels undergoing endothermal ablation in patients not on anticoagulation

Methods and Definitions

- Vessels ablated were 78 great saphenous vein (GSV) and 18 small saphenous vein (SSV) n=18

- The device used for radiofrequency ablation procedures: Covidian CF7-7-60 second-generation VNUS catheters. (N=54)

- EVLT NeverTouch kits by Angiodynamics were used for the laser ablation. (810 nm diode Laser) (N=42)

Methods and Definitions

• Technical details for the radiofrequency and laser ablation procedures - standard IFU of catheters. Tumescent anesthetic. Fiber tips 2.5 cm from SFJ or SPJ.

• After the procedure, follow-up with duplex venous ultrasound was performed at 1 week post-procedure, six months, 1 year, and then yearly to check for remote DVT, for thrombus extension from the superficial system into the deep venous system as well as to document that the treated veins remained ablated.

• Vein occlusion was defined as the absence of blood flow by duplex scan along the length of treated vein.
Demographics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>% of patients</th>
<th>% of controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>49</td>
<td>26</td>
</tr>
<tr>
<td>CAD</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Hypertension</td>
<td>56</td>
<td>17</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>RF</td>
<td>54</td>
<td>69</td>
</tr>
<tr>
<td>Laser</td>
<td>42</td>
<td>50</td>
</tr>
</tbody>
</table>

Indications for Anticoagulation

- A. fib: 49%
- DVT (remote): 33%
- Mechanical valve: 7.2%
- Other: 10%

Results: Recanalization after Ablation (median follow-up time 101 days, mean 256 days)

Results: Recanalization by Treated Vessel (anticoagulated patients)

Results: Recanalization by Treatment Modality – all patients

Results – Recanalization – anticoagulated patients
Results: Recanalization Control and Anticoagulated patients Laser v RF

<table>
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<tbody>
<tr>
<td>RF</td>
<td>44</td>
<td>1 year</td>
<td>100% (vs 96% control)</td>
<td>Sharifi et al (2011)</td>
</tr>
<tr>
<td>EVLA</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVLA</td>
<td>22</td>
<td>1 year</td>
<td>83% (vs 96% control)</td>
<td>Theivacumar et al (2009)</td>
</tr>
<tr>
<td>RF</td>
<td>59</td>
<td>72 hrs</td>
<td>100% (effective)</td>
<td>Gabriel et al (2012)</td>
</tr>
<tr>
<td>EVLA</td>
<td>12</td>
<td>8 weeks</td>
<td>100%</td>
<td>Riesenman et al (2011)</td>
</tr>
<tr>
<td>RF</td>
<td>96</td>
<td>18 months</td>
<td>93% (vs 83% control)</td>
<td>NYU 2015</td>
</tr>
<tr>
<td>EVLA</td>
<td>44</td>
<td></td>
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</tbody>
</table>

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

Results Summary
• Largest study to date - Endovenous RFA and EVLT can be safely performed in patients receiving long-term warfarin therapy. Both modalities are effective and durable.
• Closure rates of the GSVs and SSVs in these patients are comparable with that of controls and previously published reports.

Results Summary
• Excellent durability
  - 12 months 100% successful ablation, RF and Laser
  - 18 months:
    - Radiofrequency ablation (93% closure rate)
    - Laser therapy (83% closure rate)

Answers
• Is it Effective? – Yes
• Is it Durable? – Yes - up to 2 years, longer follow up pending.
References