Treating large recurrent varicose veins with the Steam Micro catheter

Dr R. Milleret

Clinique Pasteur - Pezenas
Steam ablation, radiofrequency or laser ablation: an in-vivo histological comparative trial
Thomis S¹, Verbrugghe P¹, Milleret R², Verbeken E¹, Fourneau I, Herijgers P¹.

1 University Hospital Leuven, Belgium.
2 S.E.L.A.R.L. Vein Center, Montpellier, France
<table>
<thead>
<tr>
<th></th>
<th>Weight (kg)</th>
<th>Length Treated (cm)</th>
<th>Tumescence (ml/cm)</th>
<th>Energy (J/cm)</th>
<th>Preoperative diameter (mm)</th>
<th>% Diameter decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVLA (n=4)</td>
<td>50,8 ± 10,7</td>
<td>13,3 ± 1,5</td>
<td>4,13 ± 0,59</td>
<td>41,64 ± 3,69</td>
<td>5,0 ± 1,0</td>
<td>6,35 ± 2,95</td>
</tr>
<tr>
<td>RFA (n=4)</td>
<td>50,6 ± 15,2</td>
<td>12,3 ± 3,5</td>
<td>3,81 ± 0,54</td>
<td>36,00 ± 0,00</td>
<td>4,0 ± 0,5</td>
<td>15,26 ± 13,93</td>
</tr>
<tr>
<td>SVS (n=4)</td>
<td>49,5 ± 9,5</td>
<td>15,3 ± 1,5</td>
<td>3,10 ± 1,38</td>
<td>151,37 ± 26,08</td>
<td>4,2 ± 0,1</td>
<td>25,70 ± 21,71</td>
</tr>
<tr>
<td>Total (n=12)</td>
<td>50,3 ± 10,9</td>
<td>13,6 ± 2,5</td>
<td>3,68 ± 0,94</td>
<td>76,34 ± 57,15</td>
<td>4,4 ± 0,9</td>
<td>15,77 ± 15,88</td>
</tr>
<tr>
<td></td>
<td>Intima necrosis(%)</td>
<td>Media necrosis(%)</td>
<td>Adventitia necrosis(%)</td>
<td>Total venous necrosis (%)</td>
<td>Perivenous damage (%)</td>
<td></td>
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</tr>
<tr>
<td>EVLA (n=4)</td>
<td>78,3 ± 19,9</td>
<td>66,7 ± 24,9</td>
<td>56,7 ± 17,6</td>
<td>67,2 ± 20,0</td>
<td>4,4 ± 3,5</td>
<td></td>
</tr>
<tr>
<td>RFA (n=4)</td>
<td>90,0 ± 20,0</td>
<td>90,0 ± 20,0</td>
<td>86,7 ± 26,7</td>
<td>87,8 ± 21,6</td>
<td>6,3 ± 3,8</td>
<td></td>
</tr>
<tr>
<td>SVS (n=4)</td>
<td>90,0 ± 20,0</td>
<td>85,0 ± 19,1</td>
<td>70,0 ± 35,1</td>
<td>81,7 ± 22,1</td>
<td>1,9 ± 1,1</td>
<td></td>
</tr>
</tbody>
</table>
Principle

• A 0,8 mm, 70/100 mm long catheter.
• PEEK : heat-resistant polymer.
• Anti-reflux valve built in the connector.
• Single use.
• Forward firing.
The Trib Vein catheter
Technique
Straight recurrences

- Drop of locan anesthesia
- Echo guided puncture with 18 G Venflon
- Introduction of SVS+ in the vein.
  - Peri venous injection of local anesthésic fluid
Heating the vein

- Cold gaze around the entry point
- 4 pulses at the tip
- Then retract 1 cm; 3 pulses every cm
- Last pulse when in the Venflon
Bulging VV/ Tortusosities

• Multi punctures before heating
• Inject Saline or Saline+Lidocaine and close the venflons
• Inject local anesthesia manually under echo guidance
Bulging VV 2

• Introduce SVS+
• Check at Echo
• Reinject local anesthetic at entry point
• Cool pads at entry point
• Heat; 3 pulses under echo control; then
• 3 more if large vein
• Re inject tumescence fluid or cold saline.
Re injection of tumescence

• Immediately after heating, re-inject tumescence fluid in the whole area

* Cooling of the tissues
* Compression of the vein to reduce clot volume.
• If originating from the trunk or a straight vessel: close the vein above and under the perforator.

• If not, direct puncture:
  --- Catheterize first centimeters
  --- Or lateral puncture
Perforante de cheville
Ultrasound imaging
before
DURING
AFTER
Tributaries at 1 month
Results
Randomized study of Steam Phlebectomy versus Foam obliteration of superficial veins
Material

• 2 groups of 20 patients each, randomized.
• Location of varices: Anterior Accessory, Internal Calf, Posterior Calf
• Diameter of varices: 3 to 10, mean 6 mm.
# Post Op at 8 days

<table>
<thead>
<tr>
<th>Foam</th>
<th>Steam</th>
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</thead>
<tbody>
<tr>
<td>Inflammation</td>
<td>6/20</td>
</tr>
<tr>
<td>Pain (scale of 10)</td>
<td>2,4</td>
</tr>
</tbody>
</table>
Personal experience
Results

• 52 patients since 2012 with the new catheter
• Total of 424 punctures points.
  48 patients controlled at 1 month

INCIDENTS:
• 1 skin burn at entry point
• No burn since new protocol
• Pigmentation: 14 patients.
Follow up 6 months

- 42 patients.
- Satisfaction on analog scale: 8.4/10
- Complement by foam in 16 patients (38%)
  --- Re-opening of VV: 6
  --- Untreated: 10
- Pigmentation: 6 (15%)
Result at 1 month
Advantages of Trib Vein

• Safety: reduces the risk of burns
  --- At entry point
  --- On the VV

• Built-in anti reflux valve reduces the risk of cross-contamination.

* Time-saving procedure
Tactics

• Stand-alone procedure:
  --- recurrent varicose veins
  --- malformations

• Combined with Truncal ablation:
  --- Steam/RF if large vein
  --- Catheter delivered foam if less than 7 mm at mid tigh.
Recurrent Varicose Veins

• Segments treated with long catheters
• Neo junctions and varicose veins with small catheters
• Eliminates need to reopen in the Scarpa or the popliteal fossa.
Steam and Foam

- Less inflammatory reaction
- Less evacuation punctures
- Less pigmentation

- Foam can be combined for smaller tributaries
- And at the follow up consultation if some segments still patents.
Steam and Phlebectomy

- Phlebectomy can be combined with Steam to save operating time when VV are diffuse.

- In areas where shoe pressure is expected phlebectomy should be preferred (same is true for phlebectomy versus foam)
Conclusion

• Steam is a tool in a tool box of treatments,
• There is a learning curve, as always
• During this period it is better to under-treat than over-treat, as foam can be used to achieve a better final result later.
* Once mastered, steam is a valuable adjunct in a busy practice – patient’s satisfaction is high.