Endovenous Thermal vs. Endovenous Chemical Ablation – What is the Best for the Patient

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Disclosures

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Development of Varicose Vein Therapy

- 1998 CE mark for Radiofrequency ablation (RFA)
- 1999 CE mark for endovenous laser ablation (ELA)
- 1998 CHIVA
- 2004 Renaissance of foam sclerotherapy
- 2007 Stripping without ligation of the SFJ (ASFAL)
- 2009 Steam ablation
- 2011 Mechano-chemical ablation (Clarivein™)
- 2012 Closing the vein with Cyanoacrylat glue (Sapheon™)
RFA – Perioperative Complications

Deep Vein Thrombosis, Pulmonary Embolism

- DVT Closure Plus™ 0% (Lübke 2008)
- DVT Closure Plus™ 0,2% (Noppeney 2008)
- DVT Closure Fast™ 0% (Pröbstle 2008)
- PE Closure Plus™ 0,2% (Noppeney 2008)
- PE Closure Fast™ 0% (Pröbstle 2008)
Perioperative Complications and Side Effects

<table>
<thead>
<tr>
<th>follow-up</th>
<th>1 week</th>
<th>1 year</th>
<th>3 years</th>
<th>4 years</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>ecchymosis</td>
<td>5.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>erythema</td>
<td>2.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>hematomas</td>
<td>1.4%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>paresthesias</td>
<td>3.4%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
<tr>
<td>phlebitis</td>
<td>1.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>pigmentation</td>
<td>2.4%</td>
<td>1.0%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
<tr>
<td>thrombus extension, DVT</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
ELA- Perioperative Complications

- Analysis of 1020 procedures from 11 European and US centers
  - DVT 0.6%
  - Hyp- und paresthesias 2.7%
  - Skin burn 0.9%

Spreafico G, et al Laser saphenous ablations in more than 1,000 limbs with long-term duplex examination follow-up.
Ann Vasc Surg 2011; 25: 71-78
ELA – Perioperative Complications

- ELA with bare fibers has a higher perioperative complication rate and produces more perioperative pain due to perforations
  
  (Doganci S, 2010; Schwarz T, 2010)
RFA – Return to Work

- Return to work after RFA significant faster in comparison to stripping

Results

• RCT with 580 legs stripping, ELA, RFA and FS

➢ Reflux in the GSV after 1 year

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Reflux Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>STR</td>
<td>4.8%</td>
</tr>
<tr>
<td>ELA</td>
<td>5.8%</td>
</tr>
<tr>
<td>RFA</td>
<td>4.8%</td>
</tr>
<tr>
<td>FS</td>
<td>16.3% (p&lt;0.001)</td>
</tr>
</tbody>
</table>
Occlusion Rate of the GSV

T.M. Pröbstle, B. J. Alm, O. Göckeritz, C. Wentzel, T. Noppeney, C. Lebard, C. Sessa, D. Creton, O. Pichot
Five year results from the prospective European multicenter cohort study on radiofrequency segmental thermal ablation for incompetent great saphenous veins

91.9 ± 1.8\%
# ELA – Results

## Occlusion Rates

<table>
<thead>
<tr>
<th>Author</th>
<th>Study type</th>
<th>Follow up months</th>
<th>Occlusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rasmussen 2011</td>
<td>RCT</td>
<td>12</td>
<td>94.2%</td>
</tr>
<tr>
<td>Rasmussen 2010</td>
<td>RCT</td>
<td>24</td>
<td>99%</td>
</tr>
<tr>
<td>Christenson 2010</td>
<td>RCT</td>
<td>24</td>
<td>95.6%</td>
</tr>
<tr>
<td>Rasmussen 2012</td>
<td>RCT</td>
<td>24</td>
<td>82.2%</td>
</tr>
<tr>
<td>Disselhof 2011</td>
<td>RCT</td>
<td>60</td>
<td>91%</td>
</tr>
<tr>
<td>Van den Bos 2009</td>
<td>Metanalysis</td>
<td>60</td>
<td>95.4%</td>
</tr>
<tr>
<td>Rasmussen 2013</td>
<td>RCT</td>
<td>60</td>
<td>82.1%</td>
</tr>
<tr>
<td>Ravi 2009</td>
<td>Case Series</td>
<td>66</td>
<td>86%</td>
</tr>
</tbody>
</table>
T.M. Pröbstle, B. J. Alm, O. Göckeritz, C. Wentzel, T. Noppeney, C. Lebard, C. Sessa, D. Creton, O. Pichot
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Development of the VCSS Score

after 5 years 1.3 ± 1.7 (p<0.0001)
• Significant improvement of VCSS and AVVSS after ELA up to 24 months postoperatively (Darwood 2008, Kalteis 2008, Dasselhoff 2008, Almeida 2009)

• Improvement of quality of life up to 16 months postoperatively (Kalteis 2008, Almeida 2009)
Summary RFA and ELA

- RFA has a standardised procedure protocol, simple to perform, ELA different wave lengths
- Perioperative complication rates are very low
- Pathological reflux can be eliminated securely
- Fast return to work, significant improvement of venous disorders and QoL
- Mid- and long term results are good and well documented in the literature
MOCA

Prospective observational study with 68 patients presenting insufficiency of the GSV, MOCA vs. RFA

- After MOCA significant less pain 14 d postoperatively (VAS 4.8±9.7 mm vs 18.6±17.0mm; p<0.001)
- Shorter return to daily activities and to work after MOCA (p=0.02)
- In both groups significant improvement of quality of life (SF36) and venous disorders (AVVQ)

MOCA

RCT MOCA vs RFA in 170 patients

• Significant less pain in the MOCA group (p=0.003)

• Improvement of VCSS, QoL similar in both groups

• Occlusion rates similar in both groups at 1 and 6 m
## Glue - Cyanoacrylat

<table>
<thead>
<tr>
<th>Studies</th>
<th>Almeida</th>
<th>E-scope</th>
<th>Lawson</th>
<th>Zierau</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSV or SSV Procedures</td>
<td>38</td>
<td>69</td>
<td>8</td>
<td>65</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>Occluded 3 months</td>
<td>35/36</td>
<td>65/69</td>
<td>8/8</td>
<td>64/65</td>
<td></td>
<td>96.6</td>
</tr>
<tr>
<td>Occluded 12 months</td>
<td>33/36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>91.7</td>
</tr>
<tr>
<td>Paraesthesia</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DVT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other SAEs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Superficial phlebitis</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>26</td>
<td>14.4</td>
</tr>
</tbody>
</table>
Single center prospective study, n=62 patients with incompetence of GSV

- Occlusion at 6 m 90.3 %, subtotal occlusion 3.2 %, no occlusion 6.5 %, diameter > 11 mm
- No compression stockings
Bozkurt AK, Yilmaz MF
A prospective comparison of a new cyanoacrylate glue and laser ablation for the treatment of venous insufficiency
Phlebology 2016; 31: Suppl 1, 106-113

RCT with 310 patients glue vs. ELA

- Significant less pain for patients treated with glue (p<0.001)
- Significant less ecchymosis with glue (p<0.001)
- Less paresthesias in the glue group (p<0.015)
- Both groups significant improvement of the VCSS and in the AVVQ
- Both groups similar occlusion rates at 12 m
# Comparison Between Different Ablation Techniques

<table>
<thead>
<tr>
<th></th>
<th>Compl. Side effects</th>
<th>Pain</th>
<th>Effort</th>
<th>Occlusion</th>
<th>Limitations</th>
<th>Long term results</th>
<th>QoL VCSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFA</td>
<td>↓↓↓</td>
<td>↓↓</td>
<td>↑↑↑</td>
<td>↑↑↑</td>
<td>+</td>
<td>↑↑</td>
<td>↑↑↑</td>
</tr>
<tr>
<td>ELA</td>
<td>↓↓</td>
<td>↓↓</td>
<td>↑↑↑</td>
<td>↑↑↑</td>
<td>+</td>
<td>↑↑</td>
<td>↑↑↑</td>
</tr>
<tr>
<td>MOCA</td>
<td>↓↓↓</td>
<td>↓↓↓</td>
<td>↑↑</td>
<td>↑↑↑</td>
<td>+</td>
<td>?</td>
<td>↑↑↑</td>
</tr>
<tr>
<td>GLUE</td>
<td>↓↓</td>
<td>↓↓↓</td>
<td>↑</td>
<td>↑↑↑</td>
<td>++</td>
<td>?</td>
<td>↑↑↑</td>
</tr>
</tbody>
</table>
Summary

• No final conclusion possible for MOCA and glue, because we don't have sufficient and long term data.

• MOCA and glue seem to be associated with less pain in comparison to other endovenous procedures.
Which form of intervention is superior to another?

“… This (question) has largely been driven by patient and physician preferences in the absence of robust evidence that one therapy is truly superior to another …”
Thank You Very Much for Your Attention

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