Non-thermal techniques for endovenous ablation

Tobias Hirsch, Practice for Vascular Diseases Halle, Germany
info@gefaessmedizin-hirsch.de
Disclosure

Tobias HIRSCH

I have the following potential conflicts of interest to report:

- Consulting: Covidien/Medtronic
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Sponsoring: ab medica (Vascular Insights)
  Kreussler
Thermal ablation is standard

USA: American Venous Forum 2011
UK: NICE Guidelines 2013
Big Data!
2000-2014

Laser : 85 studies, 15,055 limbs
RFA: 47 studies, 8,372 limbs

van Eekeren et al. Sem Vasc Surg 2014

USA: American Venous Forum 2011
UK: NICE Guidelines 2013
High occlusion rate!
Laser: 93.0% (3yr)
RFA: 93.2%
Stripping: 93.5%
Rasmussen et al. JVascSurg 2013

USA: American Venous Forum 2011
UK: NICE Guidelines 2013
Thermal ablation has side effects

Heat $\rightarrow$ Tumescent anesthesia $\rightarrow$ Needle
Heat
Tumescent anesthesia
Needle

Thermal ablation has side effects

- Pain
- Hyperpigmentation
- Risk of nerve damage
SSV: Risk of nerve damage

©Sobotta, Urban & Schwarzenberg 1988
Case report:

C4aEpAs2,3,4Pr

Damage to

Sural nerve
- sensory → lateral heel

Tibial nerve
- sensory → paraesthesia
- motor → talipes calcaneus

SSV: Risk of nerve damage
Non-thermal ablation of saphenous veins

- Mechano-chemical ablation (ClariVein™)
- Adhesive closure (VenaSeal™)
- Foam sclerotherapy
Non-thermal ablation of saphenous veins

- Mechano-chemical ablation (ClariVein™)
- Adhesive closure (VenaSeal™)
- Foam sclerotherapy
Mechano-chemical ablation

ClariVein™ (2010)
Principle: liquid sclerosant + rotating wire (3,500 rpm)
Mechano-chemical ablation

ClariVein™

CT, 32y, m
SSV reflux °2
C4 E_{\text{PA}}A_{\text{S4}}P_R
VCSS 6
Mechano-chemical ablation

ClariVein™

tributaries

ACCESS

refluxive SSV
Mechano-chemical ablation

**Results**

<table>
<thead>
<tr>
<th>Study</th>
<th>Occlusion rate</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elias, Raines</td>
<td>97%</td>
<td>N=30, 6 months</td>
</tr>
<tr>
<td>Phlebology 2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boersma et al.</td>
<td>94%</td>
<td>N=50, 12 months</td>
</tr>
<tr>
<td>Eu J Vasc Endovasc Surg 2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van Eekeren</td>
<td>88%</td>
<td>N=106, 12 months</td>
</tr>
<tr>
<td>J Endovasc Ther 2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bootun et al.</td>
<td>92% (RCT)</td>
<td>N=60, 1 month</td>
</tr>
<tr>
<td>Phlebology 2014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mechano-chemical ablation

Advantages

Low pain
Low hyperpigmentation
No nerve damage
Quickly done
No generator required
# Mechano-chemical ablation

## Advantages
- Low pain
- Low hyperpigmentation
- No nerve damage
- Quickly done
- No generator required

## Disadvantages
- Dosage limitation
- Anatomical limitations
- Reimbursement (D)
Non-thermal ablation of saphenous veins

- Mechano-chemical ablation (ClariVein™)
- Adhesive closure (VenaSeal™)
- Foam sclerotherapy
Adhesive closure

Venaseal™ (2011)
Principle: application of cyanoacrylate adhesive by catheter
Adhesive closure

VenaSeal™

PB, 48y, m
SSV reflux °2
C3 $E_P A_{S4} P_R$
VCSS 4
Adhesive closure

VenaSeal\textsuperscript{TM}

tributaries

refluxive SSV

ACCESS
Adhesive closure

Results

Feasibility Study
Almeida et al. Phlebology 2014
92%
n=38, 24 months

eSCOPE
Proebstle et al. JVS 2014
93%
n=70, 24 months

VeClose
Morrisson et al. JVS 2015
98.9% vs. 94.3 RFA
n=242, 6 months

Occlusion rate

FDA approval 2015
Adhesive closure

Advantages

Low pain
No hyperpigmentation
No nerve damage
No stockings
No generator required
Adhesive closure

Advantages
Low pain
No hyperpigmentation
No nerve damage
No stockings
No generator required

Disadvantages
Time
Junctions tricky
Implant
High costs
Non-thermal ablation of saphenous veins

- Mechano-chemical ablation (ClariVein™)
- Adhesive closure (VenaSeal™)
- Foam sclerotherapy
Foam sclerotherapy

Polidocanol/STS + air 1:4 2003

Principle: duplex-guided sclerotherapy of saphenous veins using foam
Foam sclerotherapy

Results

Gillet et al.
Phlebology 2009

Rasmussen et al.
Br J Surg 2011

Shadid et al.
Br J Surg 2012

Chapman-Smith
Phlebology 2009

Occlusion rate

90%
n=1,025, 1 month

84%
n=144, 12 months

65%
n=230, 24 months

35%
n=203, 60 months
Foam sclerotherapy

POL+air 1:4

KZ, 38y, m
GSV reflux °3
C4 EP A S 2,3 P R
VCSS 8
Foam sclerotherapy

POL/air 1:4

SFJ (competent!)

ACCESS

refluxive GSV

tributaries
Foam sclerotherapy

Advantages

- Low pain
- Quickly done
- No generator required
- Low costs
## Foam Sclerotherapy

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low pain</td>
<td>Lower occlusion rates</td>
</tr>
<tr>
<td>Quickly done</td>
<td>Selection required</td>
</tr>
<tr>
<td>No generator required</td>
<td>Hyperpigmentation (Paradoxic embolism)</td>
</tr>
<tr>
<td>Low costs</td>
<td></td>
</tr>
</tbody>
</table>
Non-thermal ablation

- Competitive results
- Less trauma, less pain
- No nerve damage
Thank you for your attention!

This is a picture from Marina Hirsch.

info@gefaessmedizin-hirsch.de
Non-thermal techniques for endovenous ablation

Tobias Hirsch, Practice for Vascular Diseases Halle, Germany
info@gefaessmedizin-hirsch.de