Advantages and pitfalls of endovenous glue in varicose vein treatment
Disclosure

Speaker name: Tobias HIRSCH

I have the following potential conflicts of interest to report:

- **Consulting:** Medtronic, Sigvaris
- **Honoraria:** Biolitec, Kreussler, L&R, Medi, Bauerfeind
Thermal Ablation is standard

USA: American Venous Forum 2011
UK: NICE Guidelines 2013
Endovenous ablation (radiofrequency and laser) and foam sclerotherapy versus open surgery for great saphenous vein varices (Review)

Nesbitt C, Bedenis R, Bhattacharya V, Stansby G
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
High occlusion rate!

Laser: 84.8% (5yr)
RFA: 88.7%

Balint et al. JVascular 2016: 862 articles – 17 RCT

USA: American Venous Forum 2011
UK: NICE Guidelines 2013
Laser: 12 devices
- 940 nm
- 532 – 2,100 nm
- 1,320 nm
- 1,470 nm
- (810 nm)
- Bare fibre
- Radial
- Radial 2-ring

RFA: 3 systems
- ClosureFast™
- RFiTT®
- Veinclear™
- EVRF® FCare
Do we need more devices?
Thermal Ablation has side-effects

**Heat**

**Tumescent anesthesia**

**Needle**

Pain

Hyperpigmentation

Risk of nerve damage
Risk of nerve damage: Small saphenous vein
Risk of nerve damage: Small saphenous vein

**Damage to**

- **Sural nerve**
  - sensory
  - lateral heel

- **Tibial nerve**
  - sensory
  - paraesthesia
  - motor
  - talipes calcaneus

©Sobotta, Urban & Schwarzenberg 1988
Risk of nerve damage: Small saphenous vein

**Damage to sural and tibial nerve**

**Paraesthesia**

- Boersma et al. *J Endovasc Ther* 2016 (28 studies, 2,950 SSV)
  - RFA: 9.7%
  - EVLA: 4.8%

- Van Groenendael *Phlebology* 2010
  - EVLA: 9%

- Park et al. *Dermatol Surg* 2014
  - RFA: 26%

©Sobotta, Urban & Schwarzenberg 1988
Adhesive closure
## Adhesive closure

### History

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Year</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl 2-cyanoacrylate</td>
<td>1960s</td>
<td>nerve lesions</td>
</tr>
<tr>
<td>Isobutyl 2-cyanoacrylate</td>
<td>1970s</td>
<td>wound closure</td>
</tr>
<tr>
<td>N-octyl-cyanoacrylate</td>
<td>1996</td>
<td>wound closure</td>
</tr>
<tr>
<td>N-butyl 2-cyanoacrylate</td>
<td>1989</td>
<td>vascular use</td>
</tr>
</tbody>
</table>
Adhesive closure

History

Tissue-compatible in thousands of patients
No indications of carcinogenity
Adhesive closure
Adhesive closure
Adhesive closure

No tumescent anaesthesia

Low pain

No nerve damage
Adhesive closure

Occlusion rate
### Adhesive closure

#### Occlusion rate

<table>
<thead>
<tr>
<th>Study</th>
<th>Occlusion Rate</th>
<th>Sample Size</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility Study</td>
<td>92%</td>
<td>n=38, 24 months</td>
<td></td>
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<tr>
<td>Almeida et al. Phlebology 2014</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eSCOPE</td>
<td>93%</td>
<td>n=70, 24 months</td>
<td></td>
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<tr>
<td>Proebstle et al. JVS 2014</td>
<td></td>
<td></td>
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<tr>
<td>VeClose (RCT)</td>
<td>94.4% vs. 91.9% RFA</td>
<td>n=146, 36 months</td>
<td></td>
</tr>
<tr>
<td>Morrisson et al. Phlebology 2018</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>FDA approval 2015</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Adhesive closure

Easy to learn

VeClose: Roll-in-study: GSV closure rate at month 3

<table>
<thead>
<tr>
<th>Proportion of Closure</th>
<th>CAC (n=104)</th>
<th>RFA (n=108)</th>
<th>Roll-in (n=19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete occlusion n(%)</td>
<td>103 (99.0)</td>
<td>103 (95.4)</td>
<td>19 (100)</td>
</tr>
<tr>
<td>Incomplete occlusion n(%)</td>
<td>1 (1)</td>
<td>5 (4.6)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Patients lost during follow up, n(total)</td>
<td>4 (108)</td>
<td>6 (114)</td>
<td>1 (20)</td>
</tr>
</tbody>
</table>

*Kolluri et al., J Vasc Surg 2016*
Adhesive closure

Easy to learn

VeClose: Roll-in-study: GSV closure rate at month 3

Kolluri et al., J Vasc Surg 2016
Adhesive closure

Advantages
Low pain
No nerve damage
High occlusion rate
Easy to learn
No additional devices

Pitfalls?
Adhesive closure

Learning curve with the SFJ
Adhesive closure

Learning curve with the SFJ
Adhesive closure

Implant
Adhesive closure

Implant

On day 3  At 6 months  At 12 months

Kolluri et al., J Vasc Surg 2016
Adhesive closure

Implant

“phlebitis-like” reaction in up to 20%

Hirsch T, Phlebologie 2017
Adhesive closure

Implant

Body hives, itching:

Post-OP allergic reaction in 1 to 2% (??)
Adhesive closure

Implant

Body hives, itching:
treatable using steroids and antihistamines
## Adhesive closure

### Advantages
- Low pain
- No nerve damage
- High occlusion rate
- Easy to learn
- No additional devices

### Pitfalls
- Junction treatment
- Implant
- Costs
- Reimbursement
Conclusion

Advantages make adhesive closure an effective add-on to thermal varicose treatment

Pitfalls have to be discussed pre-operatively
Thank you for your attention!

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www.gefaessmedizin-hirsch.de