Step by step
Cyanoacrylate Embolic Adhesive

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Conflict of interest: none
Disclosures: none

VenaSeal Closure System

- CE mark 2011
- FDA approval 2015
- >4000 patients
- Cyanoacrylate
- Plasticisers

Endovenous glue: step by step

Access
- Seldinger technique with 5Fr micropuncture kit
- Pass J wire up to SFJ

Positioning
- Remove access sheath
- Insert introducer and dilator over the wire
- Remove wire and dilator and position the tip of the sheath 5cm from the SFJ
- Flush introducer with saline and leave syringe in place
Priming catheter
• Draw glue into syringe, fit to gun and prime catheter up to the mark

Mark 3cm from catheter tip: do not pass!

Position glue catheter
• Glue catheter extends 5cm beyond the introducer
• Pull the introducer back so the glue catheter is 5cm from the SFJ

Glue and pull-back sequence
• Compress the Proximal GSV and SFJ
• Dispense two doses (0.1 ml) of glue 1 cm apart
• Immediately pull back another 3cm
• Compress 3 minutes

Glue and pull-back sequence
• Dispense further doses 3cm apart with 30 seconds pressure over each one (+/- ultrasound to localise)

Treated Saphenofemoral Junction

Pitfalls
• Bubbles in GSV from flushing air
Pitfalls

• Multiple trunks:
  – Potential to glue the catheter inside the introducer

Endovenous cyanoacrylate glue

• Straightforward
• No tumescent anesthesia
• No capital equipment
• No risk of thermal nerve damage
• No compression stockings

Long term outcomes

<table>
<thead>
<tr>
<th>Time-point</th>
<th>Closure Rate VenaSeal™ System N=108</th>
<th>Closure Rate RFA N=114</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 3</td>
<td>100% (108)</td>
<td>99.1% (114)</td>
</tr>
<tr>
<td>Month 1</td>
<td>100% (105)</td>
<td>87.3% (110)</td>
</tr>
<tr>
<td>Month 3</td>
<td>99% (104)</td>
<td>95.4% (108)</td>
</tr>
<tr>
<td>Month 6</td>
<td>99% (101)</td>
<td>96.2% (105)</td>
</tr>
<tr>
<td>Month 12</td>
<td>96.8% (95)</td>
<td>95.9% (97)</td>
</tr>
<tr>
<td>Month 24*</td>
<td>94.3% (87)</td>
<td>94% (84)</td>
</tr>
</tbody>
</table>

Roll-in phase analysis demonstrated short learning curve

• Procedure time reduced from 31 to 24 minutes
  – (plateaus at 22 mins for glue and 15 mins for RFA)
• 3 month occlusion rates were 100% in the roll in group
• No adverse events

Kolluri, Gibson, Cher, Madsen, Weiss, JVS October 2016

Cohort studies with VenaSeal

• 57 legs in 29 patients
• Glue to GSV with concurrent phlebectomies
• Improved VCSS, AVVQ and SF-36 (no recurrences)
• Duplex closure rates:

<table>
<thead>
<tr>
<th></th>
<th>1 week</th>
<th>1 month</th>
<th>6 months</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSV &gt; 8mm</td>
<td>98.2%</td>
<td>90.3%</td>
<td>89.7%</td>
<td>78.5%</td>
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</tbody>
</table>

• GSV > 8mm in diameter predictive of recanalisation

Chan et al, Phlebology, 2016

Cohort studies with VenaSeal

• “795 veins after 1000 days”

<table>
<thead>
<tr>
<th>time</th>
<th>1 day</th>
<th>30 days</th>
<th>3 months</th>
<th>6 months</th>
<th>13 months</th>
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</thead>
<tbody>
<tr>
<td>Closure rate</td>
<td>99.8%</td>
<td>98%</td>
<td>98%</td>
<td>97.7%</td>
<td>97.7%</td>
</tr>
<tr>
<td>Number scanned</td>
<td>793</td>
<td>793</td>
<td>595</td>
<td>565</td>
<td>497</td>
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</tbody>
</table>

Compression used for veins >10mm
Increased dose of sealant for very large veins

Zierau, Vasomed 28.5, September 2016
Cohort studies with VenaSeal

- WAVES study: 70 veins in 50 patients
- GSV, SSV, accessory veins 4-20 mm in diameter
- No post-procedure compression
- No adjunctive procedures
- All veins closed on duplex at 1 month
- 98% patient satisfaction despite no tributary treatment

Gibson, Ferris, Vascular, May 2016 (WAVES Study)

www.londonvascularclinic.com