ASVS Trial From Singapore

A/Prof TANG Tjun Yip MD FRCS(Gen) FAMS

Singapore General Hospital, Singapore
Disclosures

Speaker name: TANG Tjun Yip MD FRCS(Gen)

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- [ ] I do not have any potential conflict of interest
Multi-Centre Registry to Investigate the Efficacy and Safety of VenaSeal Endovenous Ablation for Varicose Veins in Singapore

A Singapore VenaSeal real world post-market evaluation Study (ASVS)

TY Tang¹,², TT Chong¹, E Choke¹,²

¹ Singapore General Hospital, Singapore
² Sengkang General Hospital, Singapore
VenaSeal™

Innovative option developed to reduce patient discomfort
Performed under LA
NTNT – Non-Thermal and Non-Tumescent Technique
Uses cyanoacrylate adhesive
  Polymerize into a solid material upon contact with body fluids or tissue
  Durable, chronic occlusion of treated vein
Similar efficacy as thermal ablation techniques
Endovenous cyanoacrylate glue to treat varicose veins and chronic venous insufficiency—Experience gained from our first 100+ truncal venous ablations in a multi-ethnic Asian population using the Medtronic VenaSeal™ Closure System

Tjun Y Tang¹, Harsha P Rathnaweera², Jia W Kam³, Tze T Chong¹, Edward C Choke¹ and Yih K Tan²
VenaSeal Red Reaction –
Glue Rejection

Courtesy of Dr Tan Yih Kai
Primary Objective

Study Aim

To assess the efficacy of the VenaSeal™ Closure System (VCS) for the treatment of lower extremity superficial truncal veins in a real-world clinical setting in a multi-racial Asian population in Singapore.

1. Technical success at the time of the procedure
2. Anatomical success, reported as complete closure at 2-weeks, 3 months, 6 months and 12 months.
## Study Design

### Sample Size
- Cohort of 100 patients
- Recruitment completed in December 2017
- Active follow-up ongoing

### Trial Sites
- Singapore General Hospital
- Sengkang General Hospital

### Outcome Measurements
- Pain Score over first 10 days
- Time taken to return to work and normal activities
- Cost Effectiveness
- At **2 weeks, 3 months, 6 months and 12 months**
  - Quality of Life Score using EQ5D, AVVQ, CIVIQ
  - VCSS
  - Occlusion Rate
  - Patient Satisfaction
Trial Flow Design

- Symptomatic patients with varicose vein reflux > 0.5 /seconds on venous Duplex

- Consent ing patients complete VCSS, AVVQ, CIVIQ and EQ-5D

- 2 week F/U
  Pain score over first 10 days, time to return to normal activities/work, VCSS, AVVQ, CIVIQ and EQ-5D, venous duplex, patient satisfaction

- 3,6,12 months F/U
  VCSS, AVVQ, CIVIQ and EQ-5D, Venous Duplex, patient satisfaction
Inclusion Criteria

• **Age > 21**, able to give informed consent
• CEAP **C2 – C5** Varicose Veins
• GSV, SSV or AASV diameters of **3mm to 12mm** in standing position
• **Symptomatic** primary GSV, SSV, AASV incompetence with reflux **> 0.5 seconds** on colour duplex

Exclusion Criteria

• Current or history of DVT
• Recurrent varicose veins
• Pregnant patients
• Arterial Disease (**ABPI < 0.8**)
• Sepsis
• Patient who are unwilling to participate
• Inability / unwillingness to complete questionnaire
• Adverse reaction to CAE
• GSV/SSV/AASV severely tortuous
• Life expectancy < 1 year
• Active treatment for malignancy other than non-melanoma skin cancer
• Current regular use of systemic anticoagulation (e.g. warfarin / heparin)
• Daily use of narcotic analgesia or NSAIDS to control pain associated with venous disease
Study Progress

Recruitment 100 patients recruited
Last follow-up expected in Dec 2019
Personalized Medicine

Why Precision Medicine?

- Decreased side effects
- Tailored treatment
- Mitigate unnecessary treatment
- Reduced drug interactions
CVI Spectrum in Singapore
Go the distance... through a bad field
A Comparison Between Caucasian and Asian Superficial Venous Anatomy and Reflux Patterns – Implications for Potential Precision Endovenous Ablation Therapy

QWS Lee¹, K Gibson², SL Chan³, H Pitumpe⁴, TT Chong¹ and TY Tang¹

¹Department of Vascular Surgery, Singapore General Hospital, Singapore
²Lake Washington Vascular Surgeons, Bellevue, Washington, USA
³Health Services Research Center, SingHealth, Singapore
⁴Department of General Surgery, Changi General Hospital, Singapore
### Table 1: Patient demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Singapore (n = 127)</th>
<th>US (n = 137)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, median (range)</td>
<td>64 (18 – 88)</td>
<td>51 (23 – 92)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Male gender, n(%)</td>
<td>64 (50.4)</td>
<td>32 (23.4)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Race, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singapore Asians</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>82 (64.6)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Malays</td>
<td>33 (26.0)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Indians</td>
<td>10 (7.9)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>US Asians</td>
<td>0</td>
<td>10 (7.3)</td>
<td></td>
</tr>
<tr>
<td>Eurasian</td>
<td>2 (1.6)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>0</td>
<td>120 (87.6)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>0</td>
<td>6 (4.4)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>0</td>
<td>1 (0.7)</td>
<td></td>
</tr>
<tr>
<td>BMI, median (range)</td>
<td>26.0 (16.8 – 41.4)</td>
<td>26.6 (17.5 – 48.5)†</td>
<td>0.41</td>
</tr>
</tbody>
</table>

† Includes 2 subjects with BMI = 48.5 and 1 with BMI = 45.3.

### Table 2: Presentation of patients with venous disease in both countries

<table>
<thead>
<tr>
<th>Variable</th>
<th>Singapore (n = 200 legs)</th>
<th>US (n = 200 legs)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td>99 (49.5)</td>
<td>103 (51.5)</td>
<td>0.76</td>
</tr>
<tr>
<td>Right</td>
<td>101 (50.5)</td>
<td>97 (48.5)</td>
<td></td>
</tr>
<tr>
<td>CEAP, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>62 (31.0)</td>
<td>109 (54.5)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>78 (39.0)</td>
<td>56 (28.0)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>4a</td>
<td>28 (19.5)</td>
<td>15 (7.5)</td>
<td></td>
</tr>
<tr>
<td>4b</td>
<td>13 (6.5)</td>
<td>9 (4.5)</td>
<td></td>
</tr>
<tr>
<td>5-6</td>
<td>8 (4.0)</td>
<td>11 (5.5)</td>
<td></td>
</tr>
<tr>
<td>VCSS, median (range)</td>
<td>8 (3 – 22)</td>
<td>6 (1 – 22)²</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

² Includes 1 subject with VCSS = 21 and 2 with VCSS = 22.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Singapore (n = 200 legs)</th>
<th>US (n = 200 legs)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vein sizes (mm), median (range)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proximal calf</td>
<td>3.0 (1.0 – 7.0)</td>
<td>4.6 (0 – 14.0)*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mid-calf</td>
<td>2.55 (1.0 – 7.0)</td>
<td>3.35 (1.4 – 13.3)*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Knee</td>
<td>3.0 (1.0 – 8.0)</td>
<td>4.75 (0 – 15.7)*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mid-thigh</td>
<td>3.0 (1.0 – 16.0)</td>
<td>5.8 (1.8 – 19.5)*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Proximal thigh</td>
<td>5.0 (1.0 – 15.0)</td>
<td>6.5 (2.7 – 19.0)*</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>GSV reflux, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start site, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ankle</td>
<td>1 (0.5)</td>
<td>1 (0.6)</td>
<td></td>
</tr>
<tr>
<td>Mid-calf</td>
<td>2 (1.0)</td>
<td>23 (12.7)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Knee</td>
<td>11 (5.6)</td>
<td>7 (3.9)</td>
<td></td>
</tr>
<tr>
<td>SFJ</td>
<td>171 (86.8)</td>
<td>132 (72.9)</td>
<td></td>
</tr>
<tr>
<td>Thigh</td>
<td>12 (6.1)</td>
<td>13 (7.2)</td>
<td></td>
</tr>
<tr>
<td>Pelvic</td>
<td>0</td>
<td>5 (2.8)</td>
<td></td>
</tr>
<tr>
<td>End site, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ankle</td>
<td>184 (93.4)</td>
<td>84 (46.4)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mid-calf</td>
<td>9 (4.6)</td>
<td>58 (32.0)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Knee</td>
<td>3 (1.5)</td>
<td>12 (6.6)</td>
<td></td>
</tr>
<tr>
<td>Thigh</td>
<td>1 (0.5)</td>
<td>27 (14.9)</td>
<td></td>
</tr>
<tr>
<td>OOF, n(%)</td>
<td>61 (30.5)</td>
<td>47 (23.5)*</td>
<td>0.32</td>
</tr>
<tr>
<td>Site, n(%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ankle</td>
<td>17 (27.9)</td>
<td>11 (23.4)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mid-calf</td>
<td>15 (24.6)</td>
<td>4 (8.5)</td>
<td></td>
</tr>
<tr>
<td>Thigh</td>
<td>23 (37.7)</td>
<td>32 (68.1)</td>
<td></td>
</tr>
</tbody>
</table>
A systematic review and meta-analysis of two novel techniques of nonthermal endovenous ablation of the great saphenous vein

Cornelis G. Vos, MD, PhD,
Çağdaş Ünlü, MD, PhD,
Jan Bosma, MD, PhD,
Clarissa J. van Vlijmen, MD, PhD,
A. Jorianne de Nie, MD, 
and Michiel A. Schreve, MD

ABSTRACT

Background: Endothermal treatment of the great saphenous vein (GSV) has become the first-line treatment for superficial venous reflux. Nonthermal ablation has potential benefits for acceptability by patients and decreased risk of nerve injury. We performed a systematic review and meta-analysis to evaluate the efficacy of mechanochemical endovenous ablation (MOCA) and cyanoacrylate vein ablation (CAVA) for GSV incompetence.

Methods: MEDLINE, Embase, Cumulative Index to Nursing and Allied Health Literature, and Cochrane databases were searched for papers published between January 1966 and December 2016. Eligible articles were prospective studies that included patients treated for GSV incompetence and described the primary outcome. Exclusion criteria were full text not available, case reports, retrospective studies, small series (n < 10), reviews, abstracts, animal studies, studies of small saphenous vein incompetence, and recurrent GSV incompetence. Primary outcome was anatomic success. Secondary outcomes were initial technical success, Venous Clinical Severity Score, Aberdeen Varicose Vein Questionnaire score, and complications.

Results: Fifteen articles met the inclusion criteria. Pooled anatomic success for MOCA and CAVA was 94.7% and 94.8% at 6 months and 94.1% and 89.0% at 1 year, respectively. Venous Clinical Severity Score and Aberdeen Varicose Vein Questionnaire score significantly improved after treatment with MOCA and CAVA.

Conclusions: These results are promising for these novel techniques that could serve as alternatives for thermal ablation techniques. However, to determine their exact role in clinical practice, high-quality randomized controlled trials comparing these novel modalities with well-established techniques are required. (J Vasc Surg: Venous and Lym Dis 2017;■:1-17.)
Early Results of a Randomised Clinical Trial of Mechanochemical Ablation versus Cyanoacrylate Adhesive for the Treatment of Varicose Veins (MOCCA)

A Belramman¹, R Bootun¹, TY Tang², TRA Lane¹, AH Davies¹

¹ Section of Vascular Surgery, Imperial College London, United Kingdom
² Singapore General Hospital, Singapore
Symptomatic patients with varicose vein reflux > 0.5/seconds on venous Duplex

Consenting patients complete VCSS, AVVQ, CIVIQ and EQ-5D

Mechanochemical ablation

Pain Score immediately following endovenous ablation

2 week F/U: Pain score over first 10 days, time to return to normal activities/work, VCSS, AVVQ, CIVIQ and EQ-5D

3,6,12 months F/U: VCSS, AVVQ, CIVIQ and EQ-5D, Venous Duplex

Randomisation

Cyanoacrylate ablation
Average Discomfort Post-Treatment

- MOCA: 0-40
- CAE: 40-100

- MOCA: 0-10
- CAE: 0-10

- Average Discomfort Post-Treatment: p=0.457
- Average Score Post-Treatment: p=0.702
Treatment Time

\[ p = 0.08 \]
Pain Score Since Procedure

Visual Analogue Scale (mm)

Number of Days since Treatment

MOCA
CAE
## Ecchymosis

<table>
<thead>
<tr>
<th>Percentage area covered with ecchymosis</th>
<th>MOCA (%)</th>
<th>CAE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% or less</td>
<td>84</td>
<td>85</td>
</tr>
<tr>
<td>&gt;25%</td>
<td>15.2</td>
<td>14.3</td>
</tr>
</tbody>
</table>

p=0.355
The Future of Non-Thermal Ablation is The Future of Endovenous Ablation

“Time will tell just who fell
And who’s been left behind
When you go your way and I go mine”

–Bob Dylan,
“Most Likely You Go
Your Way and I’ll Go Mine”
Don’t Worry, Be Happy
Vein Disease Is An
Incurable Disease
ASVS Trial From Singapore

A/Prof TANG Tjun Yip MD FRCS(Gen) FAMS

Singapore General Hospital, Singapore