

# **Foam sclerotherapy of saphenous veins comparing the effect of injection via needles and catheters of different size**

Johann C. Ragg, MD

Founder and head of angioclinic® vein centers

Berlin – München – Zürich

*EVF St. Petersburg 2015*

---

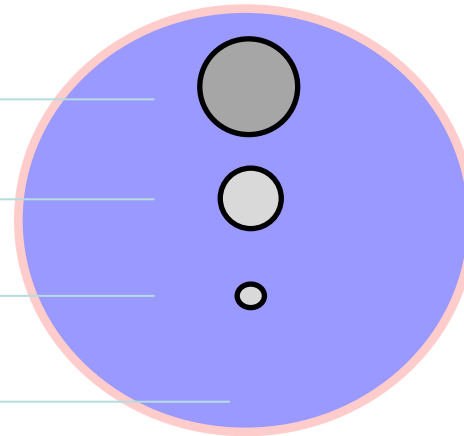
# background

---

Foam sclerotherapy is well established, but results are inferior to thermo-occlusion.

Could this be due to the size of the injection tool?

- catheter 1.7 mm
- microcatheter 1.2 mm
- needle 0.65 mm
- vein 8.6 mm



# hypotheses

---

- small injection tools will mix foam with blood or form a foam layer floating on blood;
- large injection tools will potentially replace blood completely with foam;
- considering size relations, tool diameters have to be compared to vein diameters at the time of injection (smaller than in the standing patient).

# patients

---

## comparative prospective study

- 50 patients (n = 10 each tool + 20 catheter pullback)
- insufficiency of the GSV, diameter: 6.0 – 17.8 mm
- segment length intended to treat: 45 – 50 cm
- clinical examinations 2 weeks, 8 weeks, 6 months:  
ultrasound (3D-Scan, color mode, stress tests)
- if required, additional sclerofoam injections

# methods

---

- local anaesthesia
- vein access
- 1 min. leg elevation
- horizontal leg position for injection
- 3 x injection (Aethoxysklerol 1%, 1+4 with air)
- or foam deployment in catheter pullback mode
- continuous ultrasound monitoring
- junction: compression by transducer edge, 1 min.

## Occlusion of the target segment (2 weeks)

	no flow	no reflux (>0,5 s)
catheter pullback mode	20	20
catheter	10	10
microcatheter	8	8
needle	6	7

# results

---

additional sclerofoam treatments < 6 months

catheter pullback mode 0/20

catheter 0/10

microcatheter 2/10 3 sessions

needle 4/10 6 sessions

FU 6 months: all target veins occluded

---

# results

---

Time consumption: initial procedures  
(local anaesthesia - first bandage)

microcatheter	mean 5:02 min.
needle	mean 5:12 min.
catheter 3 x inj.	mean 5:42 min.
catheter pullback	mean 3:45 min.



# results

---

Total time consumption  
including additional mapping + injection procedures

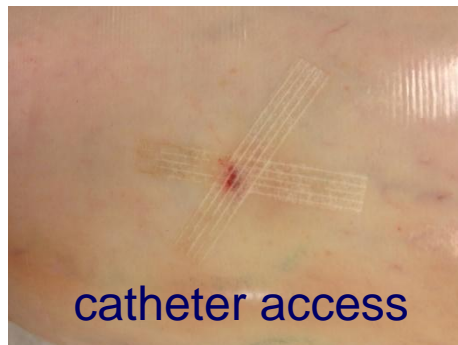
catheter pullback	mean 3:45 min.	2:40 – 5:32
catheter 3 x inj.	mean 5:42 min.	4:06 – 7:12
microcatheter	mean 7:36 min.	6:15 – 9:40
needle	mean 9:48 min.	8:05 – 11:35

# results

---

## complications

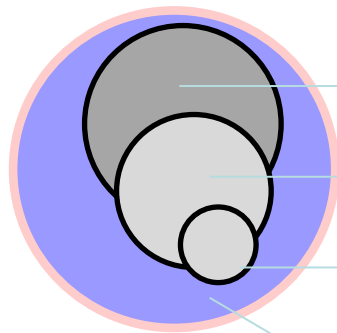
- no adverse events
- no bleedings from puncture sites
- no larger hematoma when using catheters



# results

---

average size relations at the time of injection



catheter 1.7 mm

microcatheter 1.2 mm

needle 0.65 mm

vein,  $d = 3.0 (2.5 - 3.2)$  mm

**Catheter size close to vein diameter: Effective blood replacement by foam injection.**

---

# conclusions

---

Foam sclerotherapy of saphenous veins...

- highly effective when **catheters** are used instead of microcatheters or injection needles;
- **time saving** when using catheters in spite of effort (guide wire, sterile coverings) as all procedures are "**one-step to success**";
- ready to compete with thermo-occlusion.

*read more: [www.venartis.org](http://www.venartis.org) (non-commercial)*