A new gluing modality for insufficient veins

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EVF St. Petersburg 2015

background

Thermo-occlusive techniques or sclerotherapy achieve just a slow and often symptomatic vein regression, while gluing could close and minimize veins immediately.

A first and intermediate step is continuous gluing with aggressive, almost non-resorbable acrylates (VenaSeal®).

We examined a new modality which combines sclerotherapy with pointwise gluing (ScleroGlue®).

purpose

1) to achieve rapid endothelium denaturation by catheter sclerotherapy;

2) to add pointwise gluing to instantaneously obtain closure and vein wall adhesion.

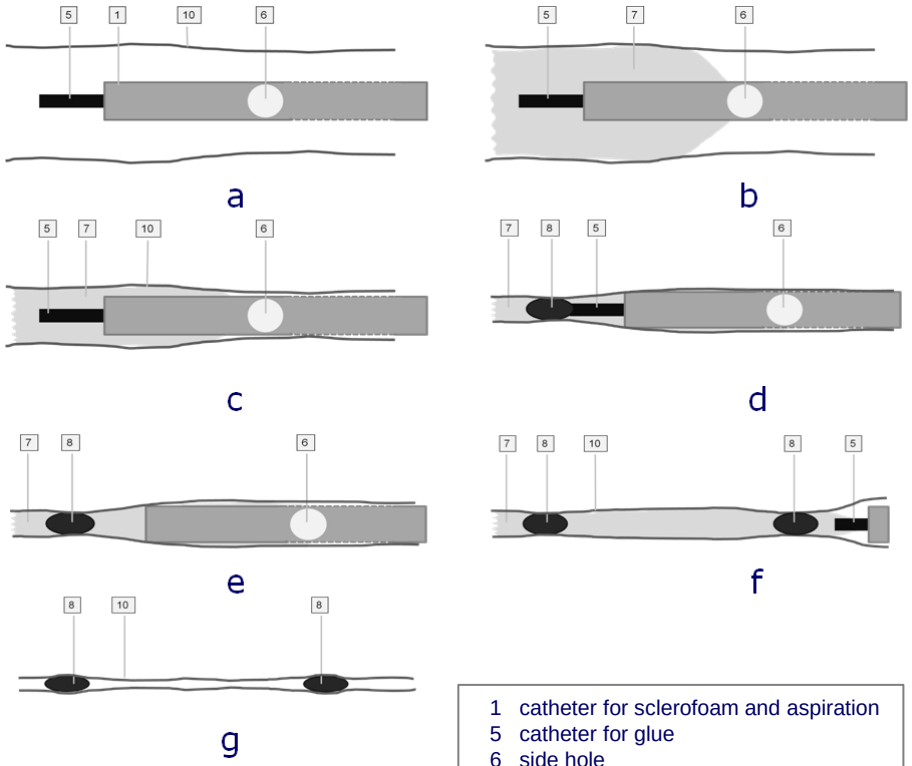
Target: Superficial veins selected for phlebectomy

Technique: Prototypes for investigational use

methods

System:

a) coaxial catheters
b) foam deployment
c) aspiration,
negative pressure
d) glue deployment
e) single glue deposit
f) repeated gluing
e.g. every 5 cm
g) final result

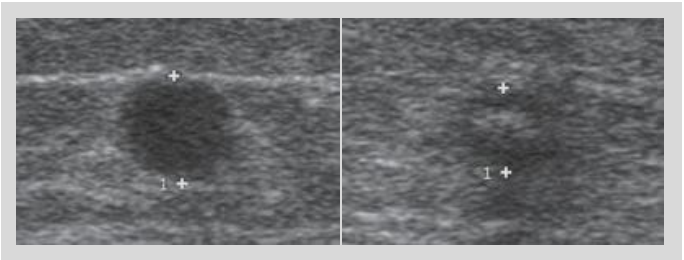


1	catheter for sclerofoam and aspiration
5	catheter for glue
6	side hole
7	sclerofoam
8	glue spot
10	vein

methods

Non-branched superficial vein segments (n = 32), length 10 - 20 cm, 6 - 12 mm Ø (mean: 8.4 mm).

- application of ScleroGlue system
- sclerosant: Aethoxysklerol 1%, 1+4 with air
- glue: butyl-cyanoacrylate
- removal of target veins
- histology (640 samples)

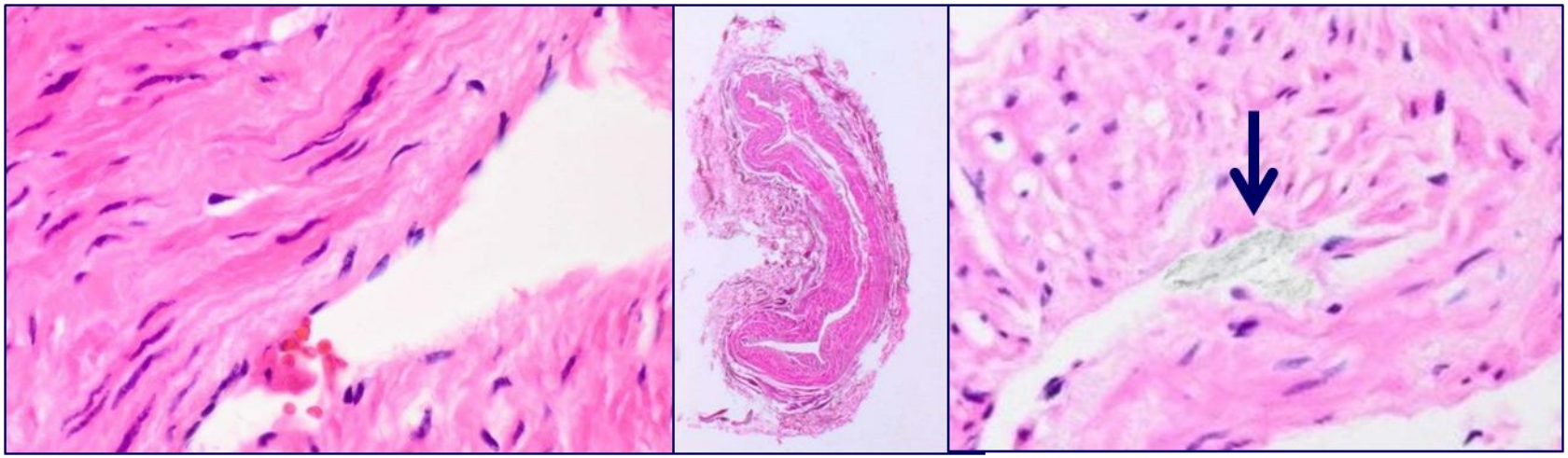


vein without glue glue spot

results

- In 29/32 vein segments histology showed total denaturation of the endothelium, while in 3/32 vein segments denaturation was 93 - 99%.
- 72 of 81 glued spots (88%) were strongly cohesive when exposed to forces of up to 10 N.
- The amount of glue used: 3 - 6 mg (mean: 4.8 mg) per cm vein, corresponding to a mean of 240 mg for a 50 cm segment.
- Application time: 6 – 11 s/cm (mean: 8.5 s)

examples



a b c

a) foam area: endothelium destroyed
b) cut close to glue spot, well attached vein walls
c) glued area with traces of glue (arrow)

discussion

- As the gluing effects are achieved independently from external compression, the method could be applicable even in obese patients.
- In vivo, selective inclusion of tributaries and perforators could be rapidly achieved without additional punctures.
- Application time may be estimated to just about 7 minutes for a 50 cm segment.

conclusions

- The initial experience with ScleroGlue® prototypes provides reliable endothelium denaturation and economical point-wise gluing.
- Some parameters like size of glue spots and length of glue-free intervals may need further investigation.
- Further tests and clinical application will be considered as soon as rapidly bioresorbable glue is available.

read more: www.venartis.org (non-commercial)