



i-MEET

NEXT GENERATION

Multidisciplinary European Endovascular Therapy

How shall we treat varicose veins
in the future ?

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J.C.Ragg - Berlin

Disclosure of Interest

Speaker name:R.Milleret

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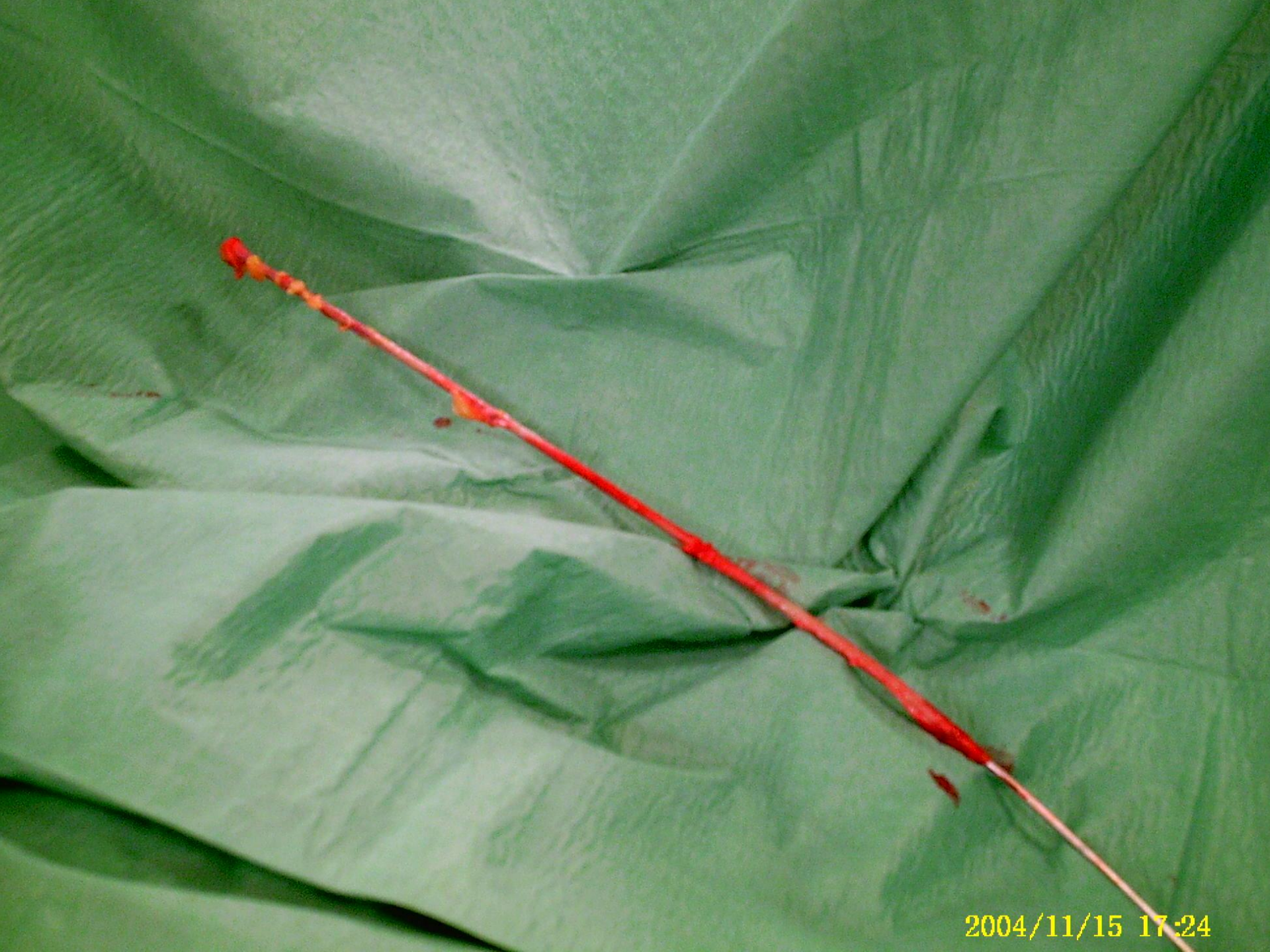
- I have the following potential conflicts of interest to report:
- Consulting : Quali Med
-
- Shareholder in a healthcare company : Miravas
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Past , Present , Future

- Past : REMOVE
Stripping
- Present : RETRACT
Thermal , Chemical techniques
- Future : REPAIR

Remove

Cryo stripping : 1978



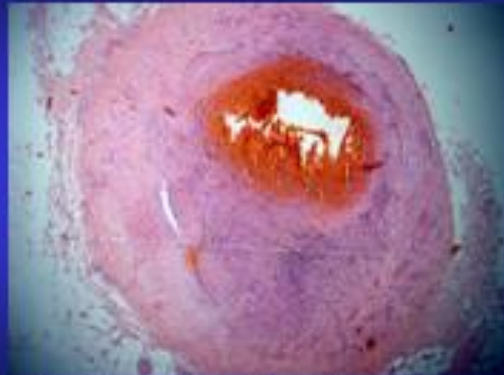
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RETRACT

- ENDOVENOUS TECHNIQUES :
 - Laser
 - RF
 - Steam

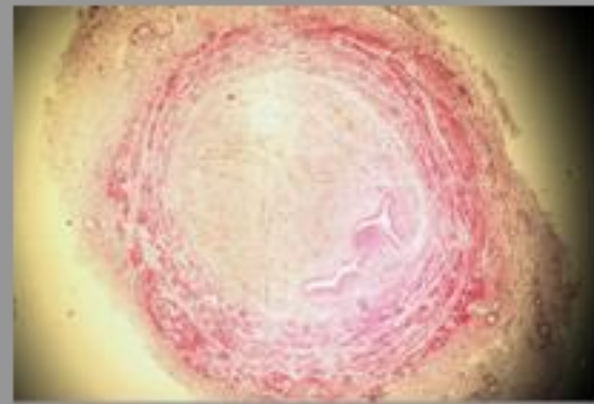
Histologic patterns

Thermal



Microscopic study after One month / Animal

Chemical



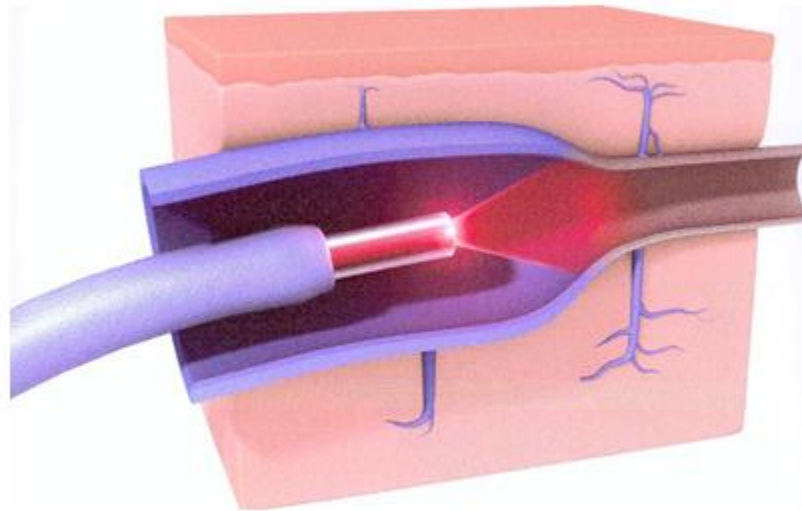
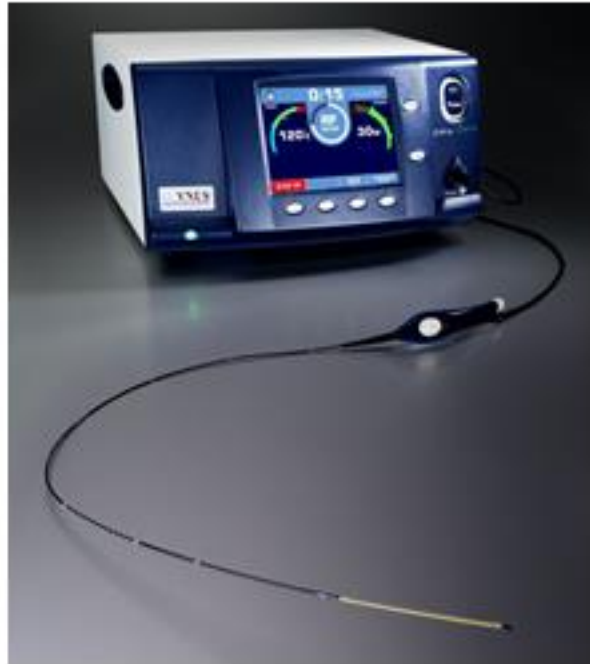


Image courtesy Sté Osyris



The Venifit® generator (Medtronic)



The Veno Steam®generator (Cerma Vein)

Combining thermal techniques

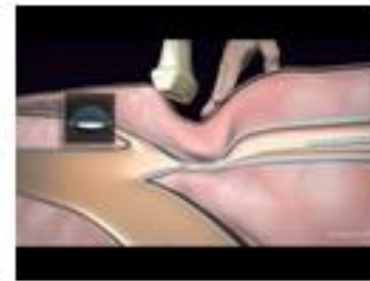
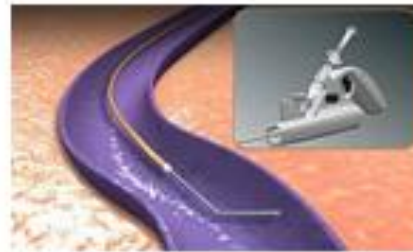
- Radio Frequency has a proven record of efficiency in Great Saphenous trunks ablation and is considered the Gold Standard .
- Steam is invaluable for tributaries and recurrences
- Both generators have been introduced nearly 10 years ago



Chemical techniques



Figure 1. The Clarivain occlusion catheter.



The Vena Seal®glue (Medtronic)



Figure 3. Varithena polidocanol injectable foam.



B.O.B : BALLOON ON BALLOON



Advantages

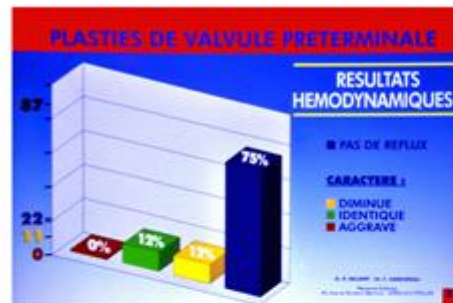
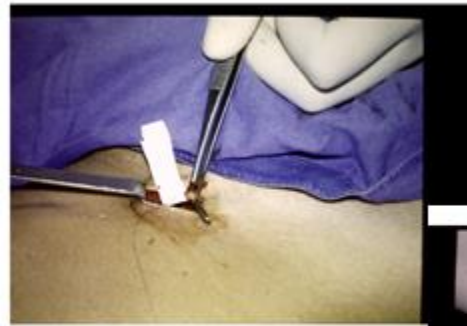
- No blood interface between vein wall and sclerosing agent
- Time of contact can be several minutes
- No tumescence
- No pain

Repair

- Non Invasive valvuloplasty :
in 25 % of our patients primary defect was
reflux at the subterminal valve (Matrix)
- Prosthetic valve

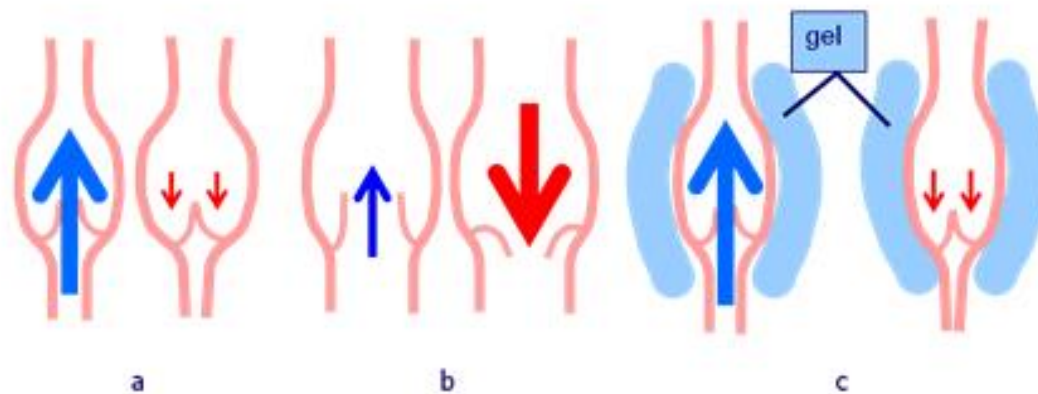
External cuffing - 1993

- We used 0,1 mm thickness Teflon pericardial patch (Gore®) because it does not induce fibrosis .
- Abolition of reflux was checked with a CW Doppler catheter which we developed .



Non Invasive Valvuloplasty

Johann Chris Ragg (Berlin)



Principle of percutaneous valvuloplasty: a) healthy vein, b) dilated and insufficient valve zone with preserved valve structures (early stage of vein disease), c) perivenous gel, valve zone diameter normalized, function restored.



a

b

c

Moderate reflux of proximal GSV and two side branches (1200 ms),
b: orthograde flow after injection of 6.8 ml hyaluronan gel (< 0,2 mm
particle size), c: gel distribution pattern



a

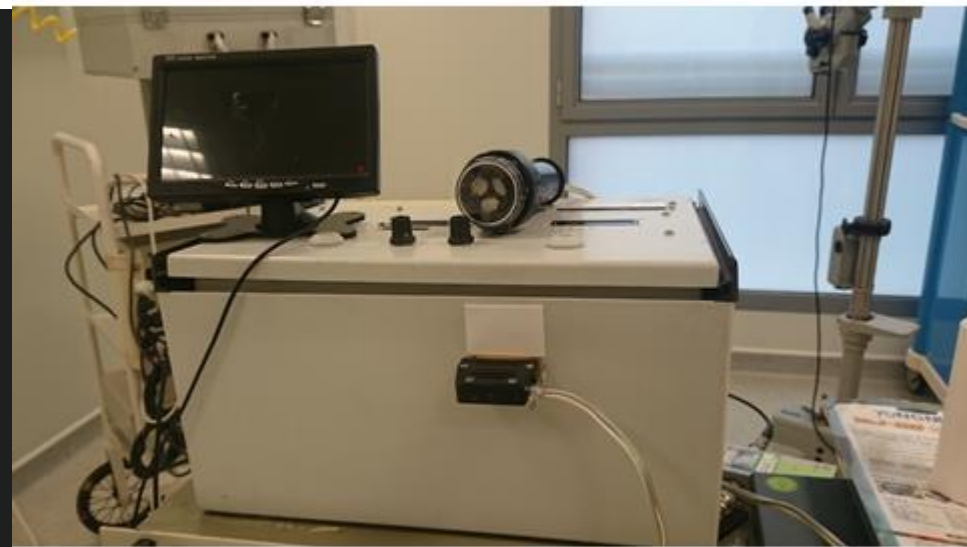
b

c

Another hyaluronan (Macrolane, particle size < 1 mm): a) Moderate reflux of proximal
GSV (1800 ms), elliptical shape most probably due to former postinflammatory adhesions,
b: orthograde flow after injection of 9.0 ml hyaluronan gel, c: gel distribution pattern

The problem : Gel embolization

Solution : Thermo sensitive gel
Injected as a liquid , heated by
ultrasound



Prototype Ultrasound device for transcutaneous heating

Prosthetic Venous Valves

- Many animal studies, some human implantations
 - With disappointing results

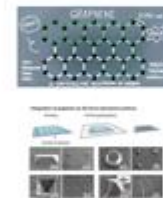


SOME PROTOTYPE VENOUS VALVES

2 Main Problems

- No **man made material** could reproduce the physical properties of valve tissue
- All these valves were supported by a **Rigid stent**, which is contrary to the Physiology of the vein wall

Graphene, the ideal material



Advantages

- **Graphene** can be used to manufacture very strong , thin and light elements .
- 3D Printers for Graphene are now available
- Graphene is non thrombogenic

The insertion ring

- Ultraviolet activated glue which does not harden when polymerized ,
- Hollow Silicone ring extruding the glue when correctly positionned
- * Inserted like an expendable stent .

Conclusion 1

- Thermal techniques were introduced in 1999/2000 but recommended as first choice by guidelines only 3 years ago .
- They will be used for many more years as the new procedures will need time to be reimbursed .
- * Home made Foam will be widely used too .

Conclusion 2

- Early detection of venous insufficiency is necessary to implement these conservative techniques .
- Patients with a family history of venous disease could be targeted first .
- Gene therapy will one day make our devices obsolete !