

Interest and limits of endoluminal laser ablation and radiofrequency ablation



Dr J-F Luthi
Spec. in Angiology
Lausanne
Switzerland

The different endovenous treatments

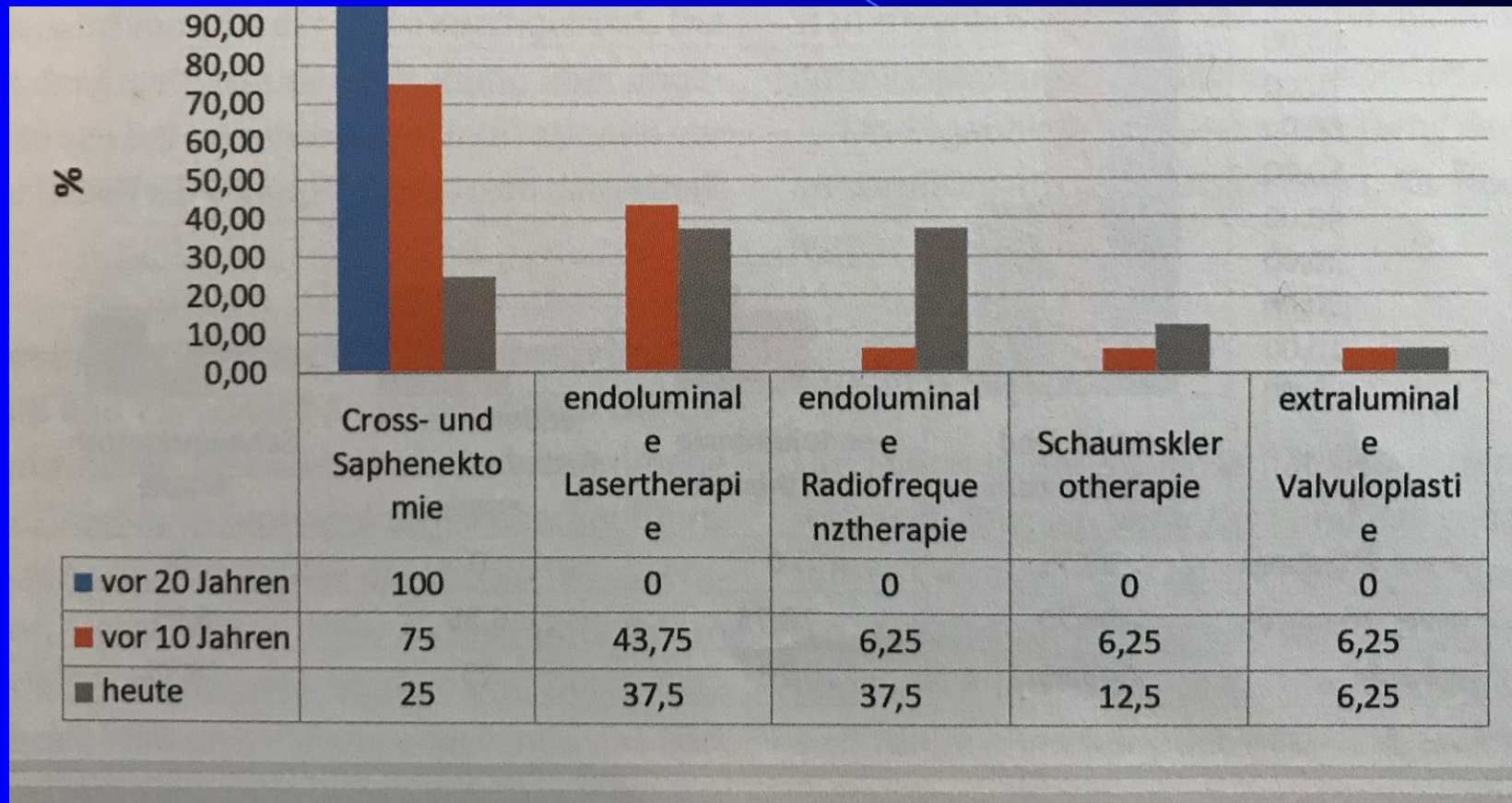
- Radiofrequency thermoablation.
- Laser thermoablation (EVLA).
- Steam thermoablation.
- Ablation by cyanoacrylat glue (VenaSeal) : no tumescence.
- Mecanochemical ablation (MOCA).
- Foam sclerotherapy.

Current indication of varicose vein treatments : US recommendations

- Endovenous treatment should constitute the first treatment of choice for people with confirmed varicose veins and truncal reflux :
- IA compared to surgery.
- IA compared to foam.

Evolution, Germany, C2-C3

(GS, < 10 mm diameter)



Required conditions for thermoablation

- Have a color duplex scan and master the exploration technique.
- Master the echoguided puncture.
- Master the Seldinger method and the fiber positioning.

Indications

- Stage C2 to C6 (CEAP) of venous chronic disease, mostly C2-C4.
- Effective on « rectilinear » recurrences with significant perforating veins.
- Anticoagulation : no contraindication.

Indication according to the depth of the trunk to be treated

- Intrafascial, « deep » and rectilinear : thermal ablation.
- Suprafascial : phlebectomy.
- Both : mixed treatment.

Essentiel points related to thermoablation

- Protocol well followed.
 - Quality of the result :
 - On the correct indication.
 - On the quality of tumescence.
 - On the amount of energy delivered.
-
- Less collateral damage, pain and morbidity than surgery.

Tumescence

- 500 cc NaCl 0.9 % or Ringer's solution.
- Addition of 25 cc lidocaïn 1 %.
- Addition of 5 cc sodium bicarbonate 8.4%.

Study of the energy delivered (radiofrequency)

- 1 cycle for a vein diameter less than 6 mm.
 - 2 cycles of 7 to 10 mm.
 - 3 cycles for more than 10 mm.
-
- Dr Lebard, presentation SEP : 3 cycles of 9-11 mm; 4 cycles of 11-15 mm; 5 cycles of 15-18 mm!

To consider...

- Local anesthesia at the point of puncture (needle 30 G).
- No narcosis or spinal anesthesia.
- Tumescence : lower flow.
- Antithrombotic prevention : enoxaparine 40 mg sc for 5 days.
- Immediate walking.
- Short work interruption.

Results of persistent occlusion after several years

- EVLA and radiofrequency: similar results greater than 90%.

Complete occlusion (GS, at 3 months, 1 year, 5 years)

EVLA 980	n=159 (95.7 %)	n=107 (99.1 %)	n=114 (88.4 %)
EVLA 1470	n=212 (100 %)	n=155 (98.7 %)	n=153 (93.3 %)
RFA	n=189 (99.5 %)	n=125 (99.1 %)	n=107 (85.6 %)

Prospective study: JVS 2013 : results at 5 years.

Original article

Five-year results from the prospective European multicentre cohort study on radiofrequency segmental thermal ablation for incompetent great saphenous veins

T. M. Proebstle¹, B. J. Alm², O. Göckeritz³, C. Wenzel³, T. Noppeney⁴, C. Lebard⁵, C. Sessa⁶, D. Creton⁷ and O. Pichot⁶

¹Department of Dermatology, University of Mainz, Mainz, ²Dermatologikum Hamburg, Hamburg, ³Venenzentrum Leipzig, Leipzig, and ⁴Gemeinschaftspraxis Nürnberg, Nuremberg, Germany, ⁵Hospital St Michel, Paris, ⁶Centre Hospitalier Universitaire Service de Chirurgie Vasculaire, Grenoble, and ⁷Clinique Ambroise Paré, Nancy, France

Correspondence to: Professor T. M. Proebstle, Department of Dermatology, University Medical Centre Mainz, Langenbeckstrasse 1, 55131 Mainz, Germany (e-mail: thomas.proebstle@web.de)

European Multicenter Study, Journal of Vascular Surgery: 2013 Proebstle, Gockeritz, Lebard, Pichot

- 295 GSV processed in 2006 and 2007.
- 8 European centers (Germany and France).
- Occlusion rate:
- Immediate occlusion 99.5% to 100%.
- at 2 years: 96.9% occlusions (98% without reflux).
- at 5 years: 91.9% occlusions (95% without reflux).
- 1.5% repermeation per year.

FAST GROUP STUDY

few side effects :

- Bruising: 5.8%
- Paresthesia: 3%
- Pigmentations: 2%
- Hematoma: 1.4%
- SVT: 1%
- | | | |
|--|--------|----------|
| | 3 days | 3 months |
|--|--------|----------|
- DVT = 0%
- Return to normal activity in 1.6 days.

ClosureFast : side effects

follow-up interval	1 week	3 months	12 months	24 months
ecchymosis (%)	5.8	-	-	-
paraesthesia (%)	3.4	2.0	0.4	0.4
pigmentation (%)	2.4	1.4	1.0	1.1
erythema (%)	2.0	-	-	-
haematoma (%)	1.4	-	-	-
phlebitis (%)	1.0	-	-	-
DVT/PE (%)	0.0	-	-	-

Tab. 1

Frequency of side effects during follow-up after segmental thermal ablation (n = 280 limbs)

Phlebologie 2/2010

Conclusions : Moderate profile of side effects.

T. Proebstle, Phlebologie 2010;39:69-71

EHIT : (Endovenous Heat induced thrombosis)

Kabnick (13) les classe en 4 catégories (schémas)

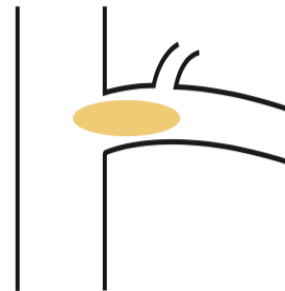
- Type 1 : pôle supérieur avant la jonction
- Type 2 : extension en VFC moins de 50 % en diamètre

- Type 3 : plus de 50 % en diamètre
- Type 4 : occlusion fémorale complète

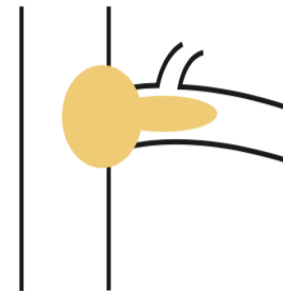
Type 1



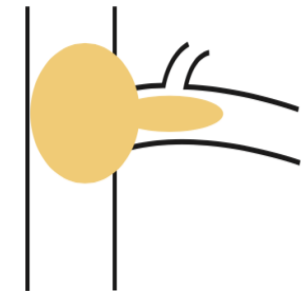
Type 2



Type 3



Type 4



R 1978

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Dr Luthi

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VEINEUX SUPERFICIEL

TIS0.0 MI 0.5

L18-5

49Hz

RS

M3

2D

69%

R Dyn 50

P Bas

HRés



✦ Dist 1.73 cm

Results for 5 years, personal retrospective serie (1)

- n = 100
- Average age : 56,5
- Female : 91%
- CEAP : 93% : C2 ; 5% : C3 ; 2% : C4
- Average diameter saphenous vein : 6,3 mm.
- Average diameter below knee : 5,5 mm.
- Associated phlebectomy in 53%
- Initial blockage of the catheter passage : 13%

Results at 5 years (2) : side effects

- Deep vein thrombosis : 0%
- Superficial vein thrombosis : 1%
- Pulmonary embolism : 1%
- Bruising : often
- Infection : 0%
- Cutaneous burn : 0%
- Paresthesia : 7% (all transient)
- Matting : 1%
- Pigmentation : 1%

Results at 5 years (3)

- Saphenous visible : 7%
- Failure : 2% (both small saphenous vein)
- Trunk visible : 0%
- Subjectively, overall improvement : 93%
- Would accept to repeat : 100%

Limits of endovenous thermal ablation.

- Tortuosity of the vein.
- Diameter ... rather no.
- Saphenous vein very superficial.
- Major sequelae of thrombophlebitis.
- Technical failure (puncture, spasm, passage of the catheter).
- Pain or intense stress ... hospital environment.
- Small saphenous vein: nerves: exceptional.

Anatomical rules to avoid complications

- Make an abundant tumescence to protect the nerves and the skin.
- Control the thermal energy applied.

Advantage of thermal ablation

- Ambulatory, without hospitalization.
- Under local anesthesia by tumescence.
- Not very painful intraoperatively.
- Fast recovery of the activity.

VEINEUX SUPERFICIEL

TIS0.1 MI 0.7

L18-5

45Hz

RS

2D

70%

R Dyn 50

P Bas

HRés

CLOSUE 3E JOUR

✚ Dist 1.67 cm

✕ Dist 1.12 cm



hadorn, 06-04-10-191128

Dr LUTHI - Angiologie - Lausanne

PHILIPS

10.04.2006

19:17:51

HD

+Long. = 0.565 cm

VNUS 72 h.

+

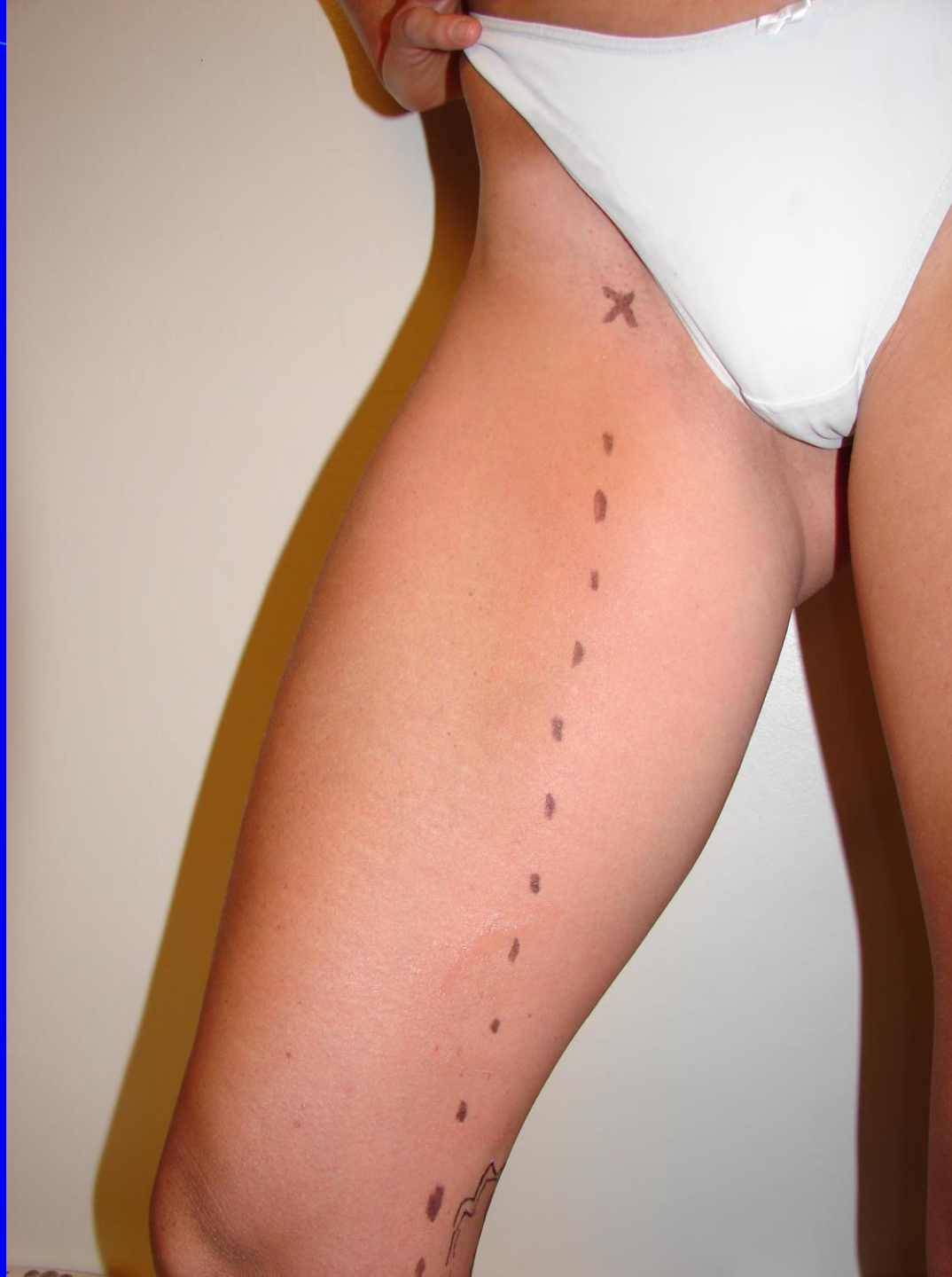
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T
P  R
5.0 12.0 

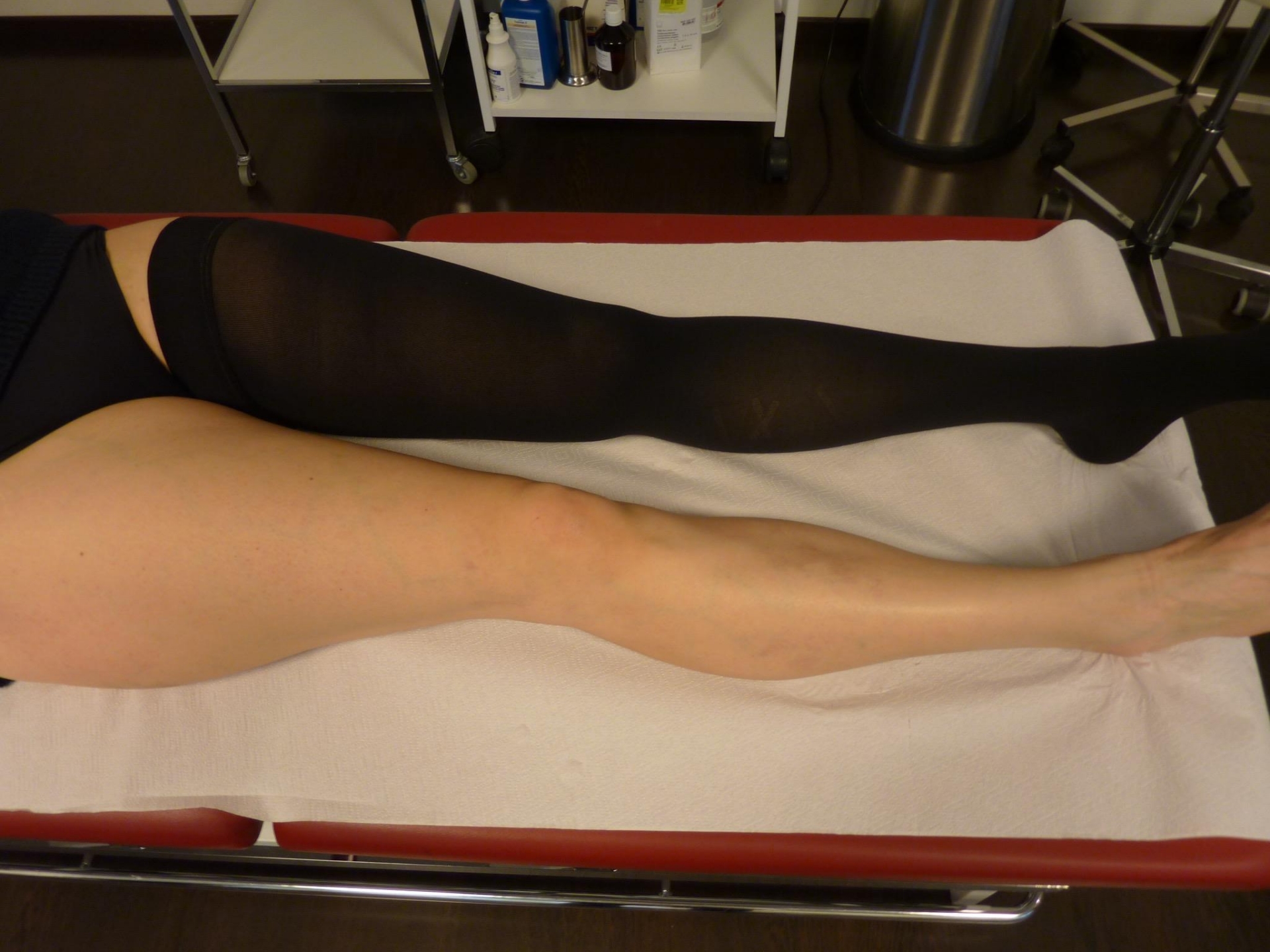
< Veines MI
L12-5 50
IM 0.7

F 3
40 %
232dB/C4
E/2/4

42 Hz
4 cm







Conclusion

- Classic surgery is no longer suitable for first-line use according to international recommendations.
- The heat treatments are not very painful and are very effective.
- They can be practiced both in the hospital and in the office.
- The method seems simple, but requires experience.

Thank you for your attention

