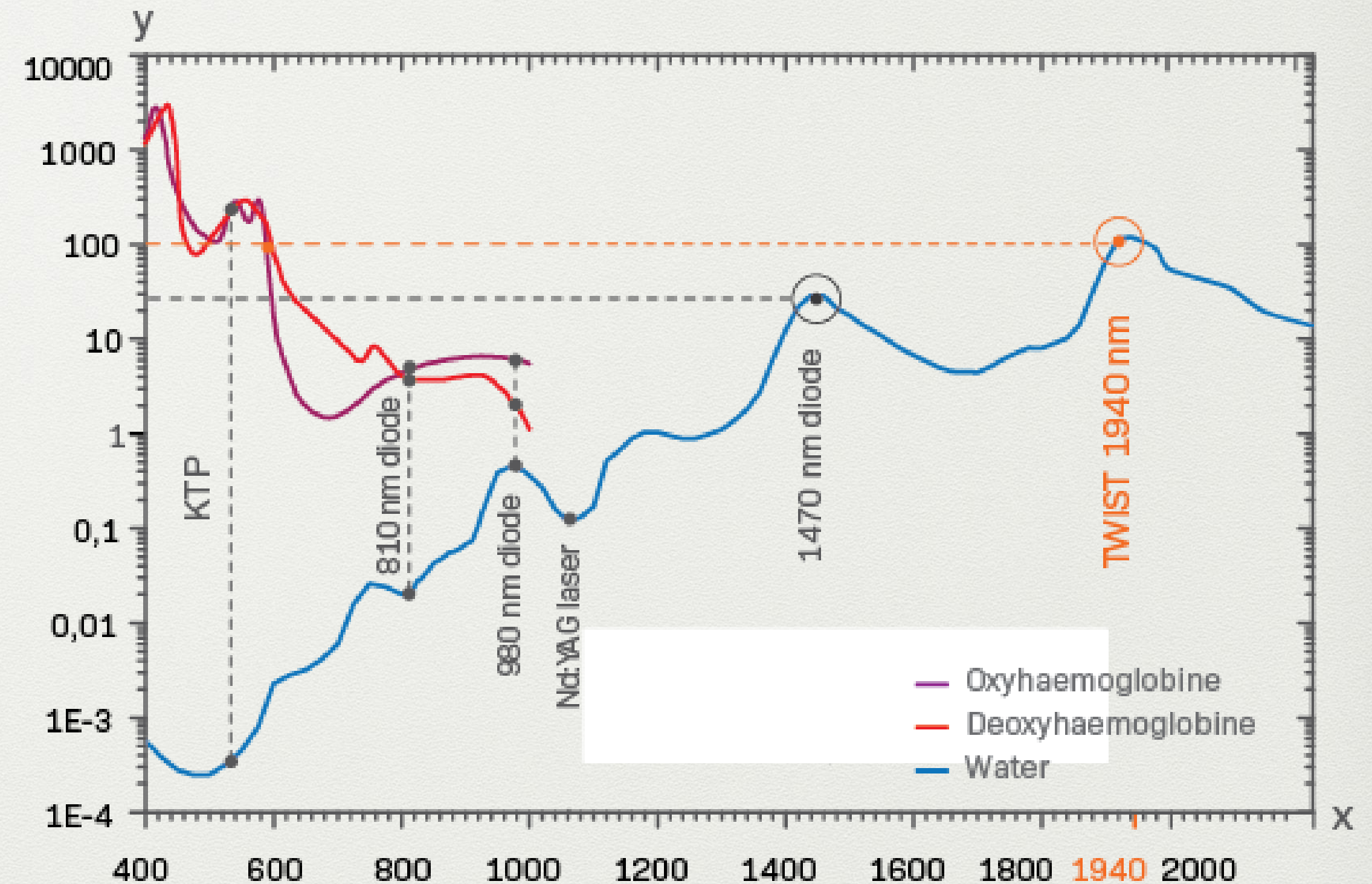


COMPARATIVE STUDY ON THE ENDOVENOUS  
TREATMENT OF VARICOSE VEINS BY LASER  
AT 1470 AND 1940NM WAVELENGTH

DR BOUNOUA

# History of of EVLA in Algeria

- 810 nm en 2008 university hospital of EHU Oran.
- 980nm: 2009 university hospital of EHU Oran
- 1470nm: 2012.
- 1940nm: 2023.



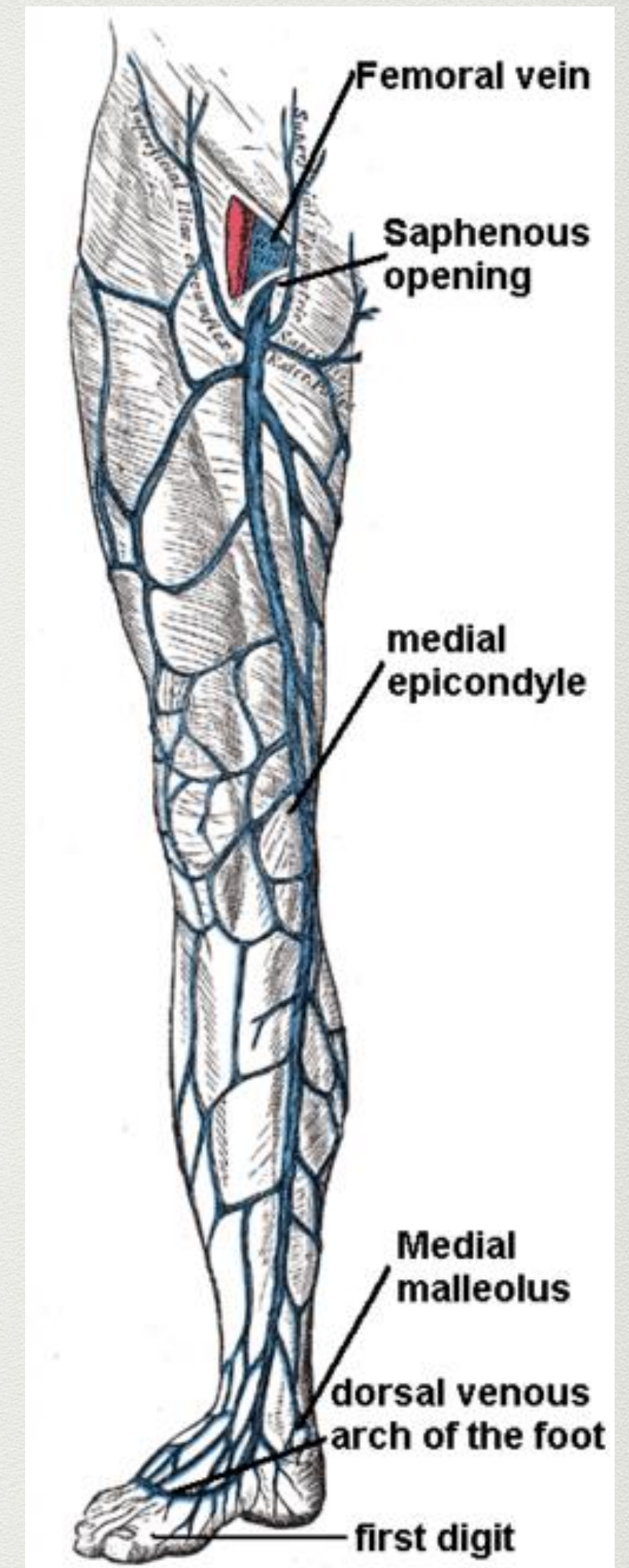
Axis y: Absorption coefficient [ $\text{cm}^{-1}$ ]

Axis x: Wavelength [nm]

# objective

- Evaluate the feasibility, effectiveness and safety of laser treatment with both wavelengths.
- compare the energy required and complications of treatment with a water absorption device and a hemoglobin absorption device
- Compare the side effects and complications of each wavelength.

- I operated from January 2023 to August 2023 on 98 patients, including 52 patients with the 1470nm device and 46 patients with the 1940nm device.
- This study did not include patients operated on for small saphenous veins, accessory veins and Jiacomini veins.
- this study did not include GSV below the knee and recurrences



- The devices used were from the GIGAALASER brand and the fibers from the LIGHTGUIDE brand with 360 degree cylindrical firing.
- while knowing that during the last few years I have worked with biolitec lasotronix gigaa: all good brands
- but my choice fell on this brand because of its advantage of using fibers from other brands

# METHODS

- Drugs: not for all patients, oral medication,
- on the day of treatment, the location of the veins to be treated was mapped on the patient's leg with the patient standing and using ultrasound guidance (GE).
- Percutaneous cannulation of the great saphenous vein (GSV).



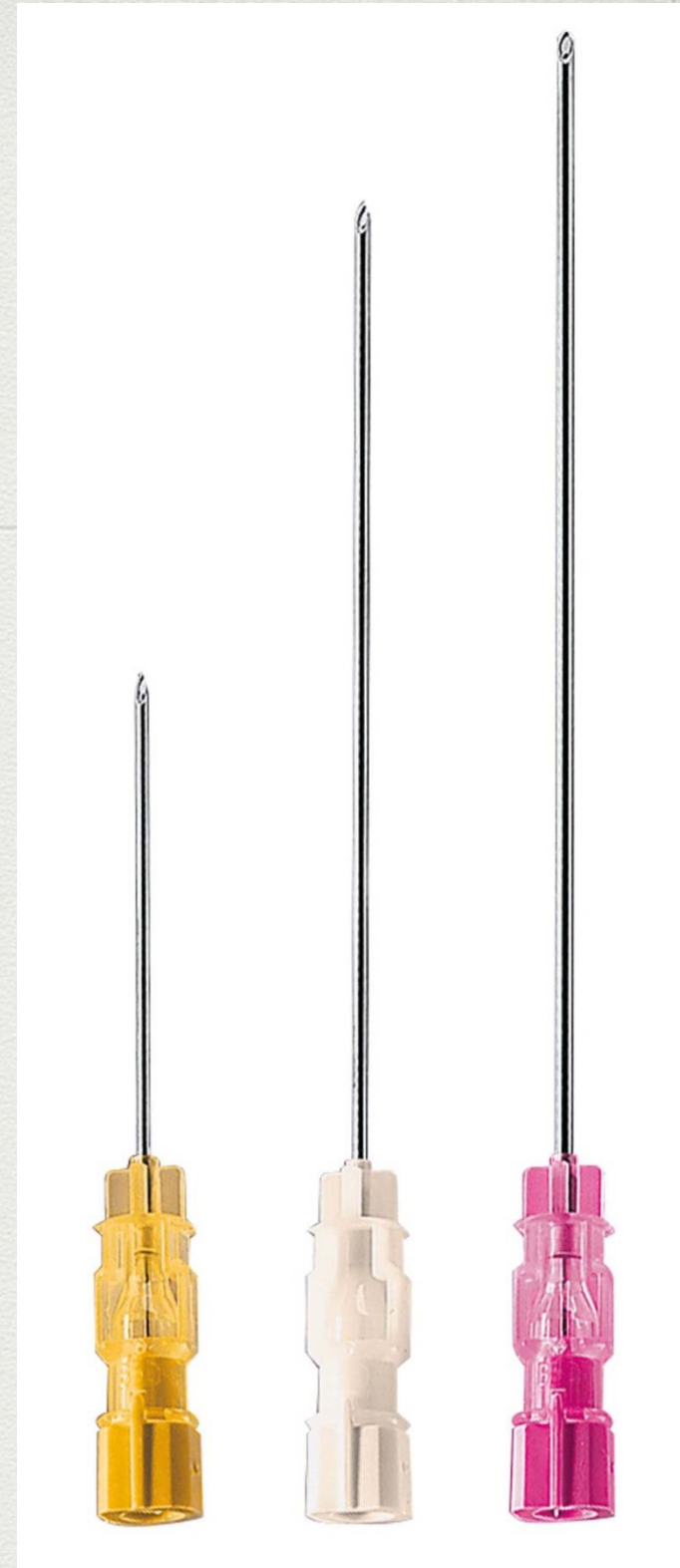
# Access

Keeping the procedure room warm


Excellent ultrasound skill is essential for successful venous puncture.

A second puncture site that is more central can be used at times of access failure - rarely

16-21 gauge needle.




- If tortuous vessel: Leg manipulation, hand pressure, 035" wire, 2nd acces.
- insertion of the laser fiber (600mm Lightguide, Germany), the fiber tip was advanced to the saphenofemoral junction.
- The distance from the laser tip to the SFJ wasn't always measured using ultrasound, the majority of the time I leave the first collateral free, 05-10mm is enough to ensure a safe distance.
- Local tumescent anesthesia was prepared using 500 mL of 0.9% saline, 50 mL of 2% lindocaine and 5 mL of 8.4% sodium bicarbonate.

 LIGHTGUIDE


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Phlebology    Proctology  
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- Gentle energy transfer with low peak temperature
- Very uniform emission
- Cylindrical 360° emission profile
- 100% direct irradiation to the target
- Reduced sticking to tissue
- Welded fiber tip design for highest safety

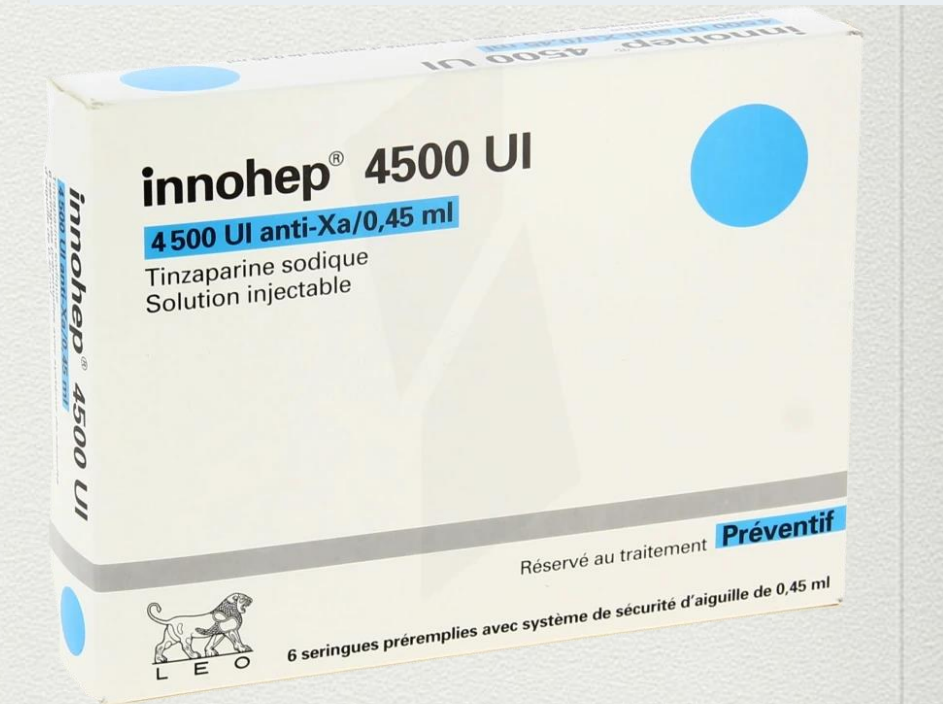
 [lightguide.com](http://lightguide.com)

- Local tumescent anesthesia was then infiltrated into the perivenous space under ultrasound guidance. Laser energy was then released at 8W for 1470nm and 6W for 1940nm, using a continuous mode.
- the pullback speed was controlled according to the evolution of the diameter.

- I have no preference between foam sclerotherapy {D30} and phlebectomy {at the same time as laser}, my decision is based on the diameter of the vein, the size of the venous bundle, superficial vein and the consent of the patient.
- For this study I completed the treatment with sclerotherapy at 30 days for two reasons.
- This gives patients time to have less pain and the second is that after thirty days the collaterals can become thrombosed and thus avoid doing sclerotherapy.



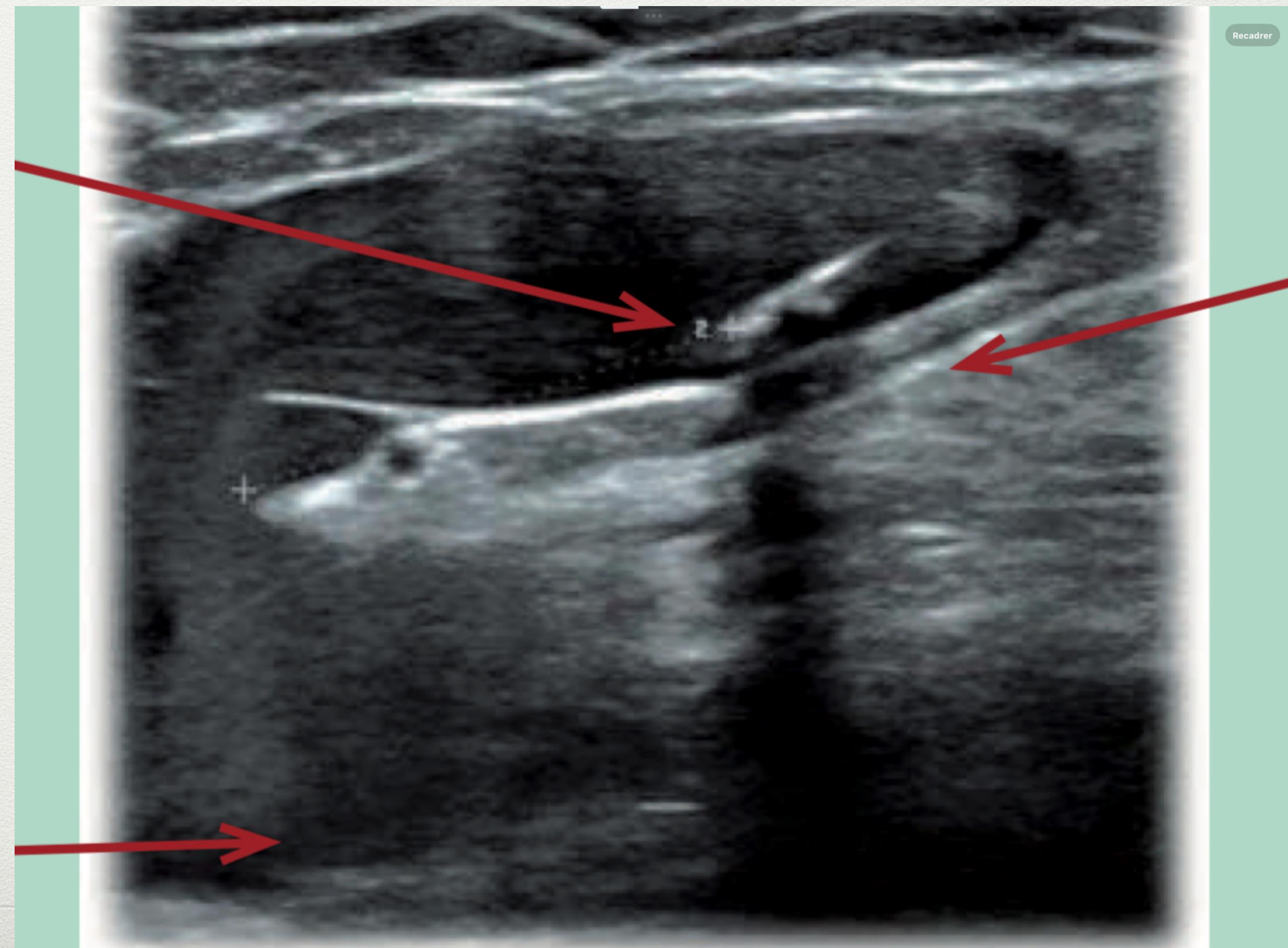
- The control is d04, d30, m3 and m6, Postoperative follow-up was done by Doppler ultrasound monitoring the suppression of reflux and occlusion of the vein.
- The patient was then instructed to wear a class 2 compression stocking during the day for 1 week. Compliance regarding the use of the stockings was not monitored.
- All the patients who had undergone EVLA routinely received thromboprophylaxis with a dose of 45000 UI/0.45ml of Tinzaparine sodique once daily for 4 days. The first dose of the anticoagulant was usually administered at 3-4 hours postoperatively.
- Routine mobilization was encouraged for the postoperative period without any limitations.



# RESULTS

- A total of 98 patients who had undergone EVLA: 52 patients (1470nm device) 82 great saphenous veins were treated and 46 patients (1940nm) 53 great saphenous veins were treated, a total of 135 great saphenous veins.
- In total : 29 patients had received bilateral treatment.
- 26 patients were excluded because these patients had undergone EVLA of recurrent varicose veins at a previously treated site (residual or neovascularization) or SSV.

- the diameter of the GSVs were between 04-12.1mm {diameter taken at mid-thigh} with sapheno-femoral junctions 05-27mm, the patients were classified according to the CEAP classification.



Demographic characteristics	(No).% or mean 1470nm	(No).%or mean 1940nm
Female sex	73 %	69.56%
Age, years	57±16	56±12
BMI, kg/cm <sup>2</sup>	31.5±7	30±9
History of phlebitis	(5) 9.61%	(4) 8.69%
CEAP class		
C2	(5). 5.10%	(4) 4.08%
C3	(17) 17.34%	(13) 13.26%
C4a	(9). 9.18%	(11). 11.22%
C4b	(5). 5.10%	(7). 7.14%
C4c	(8). 8.16%	(6). 6.12%
C5	(4). 4.08%	(1). 1.02%
C6	(4). 4.08%	(4). 4.08%

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Characteristic	(No).% or mean 1470nm	(No).% or mean 1940nm
Patients	(52). 53.06%	(46). 46.93%
Bilateral GVS (total)	30 (82)	7 (53)
Vein length, cm	33 +_ 16cm	34 + _ 15cm
Total diameter, cm	8.1 +_ 4.8mm	7.8 +_ 3.6mm
endovenous energy density J/cm	83.7+_ 18 J	78.8+_ 12 J
sclerotherapy	(44). 44.89%	(40). 40.81%

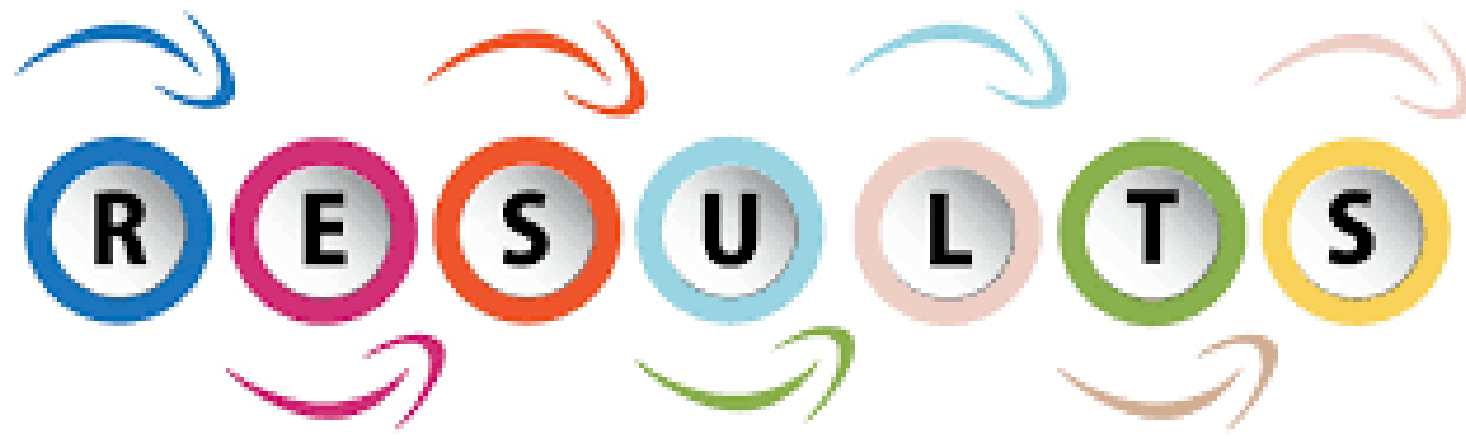
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- In this study the average diameter of the vein as well energy emitted are high because the patients are treated late.
- there is not a big difference in energy delivered for the two groups

OUTCOME	At 4 days	At 6 month
Total occlusion of truncal vein	98	98
DVT	0	0
PE	0	0
EHIT I to IV	01 patient EHIT II :30 days a prophylactic dose of anticoagulant	0
Superficial phlebitis	1	0
Paresthésia	5 (4 patients 1470- 1 patient 1940 )	0
Burns	1 (1 patient 1470)	0
Infection	3 (2 patient 1470 - 1 patient 1940)	0
Bledding (minor)	1 (1 patient 1470)	0

and paresthesia in the group of 1470.

- Tumescence under local anesthesia was carried out (no sedation was systematically administered) an energy emitted between 66 J/cm and 101 J/cm, the controls were carried out on d04 - d30 - d90 and m3.
- I recommend that patients wear compression stockings immediately post-operatively.
- Additional treatment with sclerotherapy was carried out on day 30 for the varicose leg package depending on the clinic and postoperative evolution.



- The occlusion rate is identical for the two groups although the absorption in water (1940) is greater than the absorption in haemoglobin (1470).
- Other studies have also shown that water-specific laser wavelengths are significantly more powerful than hemoglobin-specific laser wavelengths and that the direct transfer of energy to the vein allows for the use of lower energy to achieve adequate destruction of the vein wall.
- we see that the occlusion rate is excellent in both groups and this follows average energies emitted of 78 J/cm for 1940 and 83 J/cm for 1470.



- The energy emitted by 1940nm is less than that of 1470NM due to the absorption of water.
- this study aims to show that excellent results could be obtained with less energy on a water absorption device
- Post-operative advantage for 1940nm: less pain, less discomfort, reduced incidence of paresis, bruising, hyperpigmentation, infectious risks and therefore less need for tumescence.

Thanks