

# THERMOCOAGULATION OF VARICOSE VEINS TC3000-EVRF

6 Years of Treatments at Georges Pompidou European Hospital, Paris, France

## INTRODUCTION

Varicosities are permanent dilations of the micro veins located in the epidermis. They are at a depth which varies from 0.08 mm to 0.2 mm (80 to 200 microns). In the lower part, one finds the reticular derma with veins of the same name. The varicosities are mainly found on the level of the lower limbs: thigh - knee - leg - ankle and foot. They are of bluish or purple color. It is not simple to measure the diameter of the varicosities precisely. But it is reasonable to assume that the great majority have a diameter smaller than 500 microns.

The varicosities can be associated with a varicose disease, but not necessarily. More than 50% of the patients having varicosities don't have a varix. 15% of the patients having advanced varixes do not have telangiectasies.

Their physiopathology remains still quite dubious. Many factors are likely to support them: Dilated drainage veins - cellulitic infiltration - hormonal treatment - corticotherapy - systemic disease - motionless upright prolonged station - heat - compression...

This aesthetic embarrassment suffered by many patients explains the increasing request for treatment of the varicosities. Various suggested treatments are a more or less successful. For example, abrasion under dermis and micro-phlebectomy. Both have, due to their traumatic action, problems of pigmentation, and even of matting.

The laser industry tried to conquer this "market". The results, in spite of different generations of laser and wavelengths, are far from being what was hoped for. Its elective indication is the treatment of the small red varicosities. The laser is responsible for considerable side effects.

Under these conditions, micro-sclerosis is the treatment of choice for the varicosities. It has its limits however. It cannot treat the varicosities smaller than 0.3 mm (dimension of the smallest needle) and 50% of the varicosities have a diameter smaller than 0.3 mm. It requires a long training and is not without risk of potential side effects.

## THERMOCOAGULATION

Because of the insufficient results with previous mentioned treatments and in the hope to improve the effectiveness of the treatment of the varicosities, we have used the technique of thermocoagulation for more than 5 years.

Thermocoagulation is based on the eradication of the varicosities by temperature. This thermal damage is produced by a modulated Radio Frequency wave of about 4 MHz. Thermocoagulation is to be differentiated from the electrocoagulation which acts by a chemical phenomenon (with release of soda).

The source is a generator, the Veinwave. These last years technological progress allowed a noticeable improvement of high frequency generators.

- The energy (power) can be set from 20% to 100% of 3 Watts. A common used setting is 30%
- The time of impulse is variable between 0.2 and 0.8 seconds. Common settings are 0.2 to 0.4

## POPULATION

- We treated 1620 patients having spider veins on lower limbs.

- 99% of the patients were women.
- The great majority have been re-examined after 3 months then after 1 year for follow up.
- The average age of the patients was 44 years, with the range going from 19 to 78.
- They received an average of 5 sessions each (in different areas) representing a total of 7600 sessions.

## PROTOCOL OF USE

- The parameters selected on the generator were 0.2 second for the pulse time and 30% for the power
- We used isolated Ballet needles with a diameter of 0.075 mm (K3)
- We followed the recommended protocol.

## CRITERIA of INCLUSION

- All skin types were accepted. There was a majority of Fitzpatrick 1 to 3, a great number of phototype 4 and three phototype 5.
- All types of spider veins benefited from the treatment.
- All areas of the lower limbs were treated: hollow poplity – knees – thighs – feet – legs – ankles.

## CRITERIA OF EXCLUSION

Patients presenting:

- an important varicose in the vicinity
- a post-phlebotic disease
- an allergy to chromium or nickel
- patients with Pacemaker .

## TRANS-ILLUMINATION

- With trans-illumination via polarized headlamp, we observed the state of the reticular veins subjacent with the treated spider veins.
- In this population 50% had dilated reticular veins, meaning that 1 in 2 spider veins are not related to dilated reticulars.

## DIAMETER OF THE TREATED VARICOSITES

- To measure the spider veins, we compare them with the needles at our disposal 0.3 – 0.4 – 0.5 mm and the needles Ballet (0.15 in particular).
- The diameter of the spider veins treated is < or equal to 0.4 mm what represents more than 80% of the spider veins
- Many spider veins have a diameter between 0.1 and 0.3 mm.

## RESULTS

- The results were very satisfactory, but very dependant on the selected protocol.
- Respect of the recommended protocol yields results higher than 80% on all zones with spider veins of small size.
- 3 studies carried out between 2000 and 2004 give similar results.
- According to the treated zones, the effectiveness may vary.
- Cellulitic or areas with oedema (knees – thighs) are more resistant to the treatment and often require 2 or 3 additional sessions.
- The “dry” areas (feet – ankles – legs) are very receptive and frequently only one session is enough.
- The phototype is not a selective criterion.

## AFTER THE TREATMENT

- Erythema immediately after which persists a few hours.
- Micro-edemas in the hours which follow and disappear rather quickly
- Micro-crusts at the 4° day and disappearing at the end of approximately 4 weeks.

## PATIENT ACCEPTANCE

- Those which have a needle or blood phobia will be comfortable with this technique.
- As a whole, the session is well accepted on the pain level; and has the same discomfort as micro-sclerosis.
- The higher the power, the more the treatment is felt.
- In sensitive patients, it is advised to lengthen time between 2 impulses and not to exceed 200 impulses per session.
- What is appreciable is the absence of pain or discomfort immediately after the session.
- No bandage or compression garments are necessary.
- Satisfaction of the patients is very good.

## SIDE EFFECTS

- None, if the recommended protocol is respected.
- The described side effects are always transitory:
  - Pigmentation (too much energy or not enough distance between impulses )
  - Burns (even etiologies) with aspects of bubbles or erythema

## CONTRA-INDICATIONS

- Allergy to chromium and nickel
- Pacemaker
- Cutaneous infection

## ADVANTAGES

- Very powerful result
- No side effects
- Comfortable for the patient: no bandage – no post-intervention pain
- Can be practiced all year around (it is recommended to avoid solar exposure for 48 hours)

## DISADVANTAGES

- Success is operator dependent and protocols must be respected.
- Micro-crusts might persist a few weeks

## DISCUSSION

Many vein centers use this innovative treatment – some with great success, others with more random results.

Why?

- The adjustment of the parameters and the protocol used varies at different vein clinics. Those who respect the advised protocol do not have failures.
- In the failures, 80% is caused by too much energy and 20% by hitting next to the vein.

Taking this result into account, it is imperative:

- Treat the spider veins under the best conditions which means good vision.
- Position yourself perpendicular to the treated zone (which it is on a horizontal plan) and use the illuminated polarized headlamp or powerful magnifying glasses (minimum enlargement of 6).
- Do not insert the needle in the vein while pricking, but lightly hit the surface.
- We must forget the feeling of our needles penetrating the skin, for a treatment that should not penetrate the skin but only compresses it moderately. It is the “impulse test” of the protocol.

Can one decrease the duration of the micro-crusts?

- We currently are testing the gold needles. They have the reputation to minimize the cutaneous reactions.

Can one treat larger spider veins?

- If the diameter of the spider vein is higher than 0.5 mm, the power must be increased to 60%.
- But precaution is essential, because such an amount of energy consequently causes an inflammatory reaction with erythema lasting several weeks.
- In the event of resistance of a varicosity (< 0.4 mm) located in a cellulitic zone, it is preferable to increase the time of impulse to 0.5 of second.
- Many patients are open to thermocoagulation treatments.

## ***CONCLUSION***

- Thermocoagulation is a treatment of great effectiveness on spider veins.
- It avoids the pitfalls of the other treatments in terms of effectiveness and side effects.
- Clinical studies carried out since 5 years and the experimental follow-up made at the Georges Pompidou European Hospital – Paris – France, consolidates this selective treatment of spider veins.
- It is necessary for us now to harmonize our working methods and respect the advised protocol.
- It is why, following this way, thermocoagulation should become the treatment of choice and first intention of spider veins.