

Laser versus Sclerotherapy in the Treatment of Lower Extremity Telangiectasia and Reticular veins

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Presented By
Nada Abd El-Sattar Mahmoud

M.B.BCH, Ain Shams University
M.S., Ain Shams University

Supervised By

Prof. Dr. Amr Ali Salah

Professor of Plastic Surgery
Faculty of Medicine,
Ain Shams University

Prof. Dr. Ali Sadek Sabbour

Professor of General Surgery
Faculty of Medicine,
Ain Shams University

Prof. Dr. Saad Salah El Fayomy

Professor of Plastic Surgery
Faculty of Medicine,
Ain Shams University

Dr. Karim Samir Massoud

Assistant professor of Plastic Surgery
Faculty of Medicine,
Ain Shams University

Faculty of Medicine
Ain Shams University

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Aim of the work

The aim of this thesis is to evaluate and compare the efficacy, effectiveness, safety and complications of laser treatment using long pulsed - dye laser versus sclerotherapy using polidocanol in the treatment of unwanted lower extremity blood vessels ranging from 0.1 - 4mm in diameter. Also to study the effect of contact cooling on treatment results in case of using long pulsed - dye laser.

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LIST OF ABBREVIATION

Abbrev	Content
POL	Polidocanol
SPTL	Selective photothermolysis
Nd:YAG laser	Neodymium: Yttrium Aluminum Garnet laser
GSV	Great saphenous vein
LSVS	Lateral subdermic venous system
CWD ultrasound	Continuous-wave Doppler ultrasound
CMTC	Cutis marmorata telangiectasia congenita
HTT	Hereditary hemorrhagic telangiectasia
UNT	Unilateral nevoid telangiectasia
FDA	Food and drug administration
TM	Telangiectatic matting
PDL	Pulsed dye laser
IPL	Intense pulsed light
P test	Pearson Chi – Square test
S	Significant
STS	Sodium tetradecyl sulfate

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Discussion

Injection sclerotherapy and laser are the most widely used therapy in treatment of lower extremity telangiectasia and reticular veins. Various studies reported the difference between the sclerosing agents and their clinical efficacy in treatment of lower limb telangiectasia; however, other studies reported the efficacy of different types of lasers in management of telangiectasia.

Sclerotherapy is a popular and effective therapeutic modality for the treatment of varicose and telangiectatic leg veins. The procedure deserves its gold standard label if performed in a logical, stepwise fashion. There were many different categories of sclerosing agents, and there were multiple studies done to compare between them. The two most widely used sclerosing solutions world wide were sodium tetradecyl sulfate (STS) and polidocanol (POL).

Polidocanol was reported by ***Goldman et al., in 1987, Sadick in 1994, Weiss in 1994 and Noel in 2004*** as an effective, safe sclerosing solution with distinct advantages of being forgiving with extravasation and having an extremely low risk of allergic reactions. The incidence of post sclerosis pigmentation and telangiectatic matting in different sclerosing solutions including polidocanol with different concentration was conducted

in a study done by **Weiss and Weiss in 1990**. They stated that these complications were related both to vessel size and to sclerosing concentration. They detected that a higher percent of complications occurred with polidocanol 1% rather than 0.5%, also the percentage of complications increased with increasing vessel size (1-2mm in diameter).

Polidocanol at concentrations of 0.25%, 0.5%, and 1.0% was injected in the dorsal rabbit ear model by **Goldman et al., in 1987**. They reported that POL at concentration of 0.5% and 1.0% produced histologic and clinical vein disappearance, whereas POL at 0.25% did not produce clinical vein resolution. In addition, they noted recanalization at the low concentration of 0.25%.

Numerous studies were performed to compare the effect of different sclerosing agents in management of telangiectasia and reticular veins. They used polidocanol in different concentrations in their comparison. **In 1987 Carlin and Ratz** used polidocanol 0.25% in liquid form on 20 patients. The patients were injected every 4 weeks until all vessels had disappeared or for a maximum of six visits. They reported that 13 patients had good to excellent disappearance of veins and two had poor results. They stated that the level of overall improvement was good. However, they believed that the concentration of polidocanol that they used may have been too low, resulting in slower clearance of the vessels.

Another study used polidocanol 0.25% was presented by **Kern et al. in 2004**. They used POL in both forms either as liquid or foam. A single sclerosing session was performed in each patient. They proved that polidocanol concentration of 0.25% had a lower efficacy in clearing the telangiectatic and reticular veins in either forms.

Polidocanol at a concentration of 0.5% was used by **Sadick in 1994** to treat reticular veins of 2-3mm in diameter in 20 patients. A single sclerosing session was performed in each patient. He stated that polidocanol at this concentration was successful in the treatment of reticular vessels. **In 2005** another study was presented by **Rao et al.** using polidocanol in both forms, foamed and liquid. Their study was carried on twenty patients with reticular and telangiectatic leg veins. The veins were classified according to their diameter into one of the following categories: veins <1mm in diameter, veins 1 to 3mm in diameter, and veins 3 to 6mm in diameter. They used POL 0.5% solution in treatment of vessels < 1mm in diameter, POL 1% solution to treat vessels 1-3mm in diameter, and POL 1% foam to treat vessels 3-6mm in diameter. They emphasized that POL in both forms was found to be effective in causing the clearance of veins in all size categories. Ecchymosis and reversible hyperpigmentation being the most common adverse events occurred. Of note, no skin

necrosis, no recanalization was observed in any subject treated with either form. All subjects tolerated POL very well and were pleased with their treatments. Their study confirms that POL, in both solution and foam formulations, have similar efficacy, tolerability, and patient satisfaction.

In this work we used polidocanol 0.5% solution in liquid form for treatment of telangiectasia and reticular veins on 60 patients. 241 vessel were injected (72.6 % were injected only once, 27.4% were injected twice with 4 to 6 weeks interval). These vessels were classified according to their diameter into 4 groups.

Clearance occurred in all groups but its percentage was higher in group II (92.2%). When we examined the clearance of each vessel individually we found that all diameters was cleared but with different percent, the higher was for a diameter 0.7mm while the lower was for the diameter more than 3mm. This may be due to the use of POL at concentration of 0.5% which may be low to sclerose such a diameter. Hyperpigmentation was the only complication that occurred during treatment, percentage of hyperpigmentation was higher in group I. This may be due to extra volume or rapid injection in small caliber vessels which leads to damaged or destroyed vessel with extravasation of the erythrocytes. As regard patient satisfaction, all patients were

satisfied but by different degrees. The highest degree was very good by (65.1%).

In recent years the use of lasers to treat a wide range of cutaneous conditions has expanded greatly. Most of lasers used in the treatment of leg veins are based on the theory of selective photothermolysis. Flashlamp-pumped pulsed dye lasers especially 595nm pulsed dye laser are highly effective in the treatment of many cutaneous vascular lesions (**Goldman and Fitzpatrick 1990, Alora et al., 1999, Weiss and Dover, 2002, and Rohrer et al., 2004**).

Sclerotherapy is the golden standard of treatment of telangiectasia; however, **Goldman and Fitzpatrick in 1990, Lee and Lask in 1997 Weiss et al., in 2001 and Weiss and Dover in 2002** stated that there are several clinical states in which lasers are indicated. When patients prone to pigmentation from sclerotherapy, failed sclerotherapy, fine matting post sclerotherapy, ankle telangiectasia and needle phobia.

Multiple studies have assessed the effectiveness of 595 nm pulsed dye laser in the treatment of leg veins. The overall results were variable. In all patients the vessel diameter treated was less than 1 mm. **Goldman et al., in 1990** stated that only 60% of patients with a small, red telangiectases that are less than 100µm

in diameter may show a response to treatment with the pulsed dye laser. This Response was usually inconsistent and unpredictable. **In 1997** a single treatment session was performed by **Hsia et al.** with energies of 15 or 20 J/ cm². Fifty percent of the treated vessels cleared at a fluence of 15 J/ cm², and 67% cleared at 18 J/ cm². A similar study was done by **Garden and Backus in 1996** and their final results were similar. However, **Lee and Lask in 1997** performed a maximum of three treatment sessions at 6-week intervals with energies of 15 or 20 J/ cm². Their treatment response was variable and unpredictable: some patients had complete resolution, and some had only slight improvement. The best results were achieved at 20 J/ cm². In another study done by **Reichert in 1998** the treatment period varied from one to four treatment sessions according to vessel diameter. He detected that the areas treated in his study achieved total clearing after one or two treatments 6 weeks apart in all vessels with diameters up to 0.5 mm. However, vessels from 0.5 to 1.0 mm in diameter faded in approximately 80% of the cases after as many as four separate treatments. Ice packs were used to cool the skin before treatment sessions in all previous studies. Scarring, thrombophlebitis, and telangiectatic matting never occurred in any of the previous studies; however, crusting, transient hyperpigmentation and hypopigmentation occurred.