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POTENTIAL OF THE ENDOVENOUS LASER ABLATION (EVLA) IN CHRONIC VENOUS DISEASE (CVD) TREATMENT

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ABSTRACT

This research investigates the efficiency of the 980 nm wavelength laser irradiation used in endovenous laser ablation (EVLA) of patients with reflux of the great saphenous vein (GSV) and varicose veins.
Ceralas 25, (Biolitec, Germany) Laser System is used for the treatment in line with the technique described. 39 (34,7%) of the patients have been prescribed only laser treatment and the rest 73 (65,3%) of them have required a combination of EVLA with complementary therapeutic techniques (phlebectomy, sclerotherapy, lipolysis, etc.).
The efficiency of the laser treatment alone and in combination is discussed. The results obtained are estimated as good and the authors recommend EVLT as a method of choice for the treatment of chronic venous disease.

Key words: Chronic Venous Disease (CVD), Endo Venous Laser Ablation (EVLA), phlebectomy, sclerotherapy

INTRODUCTION

The Great Saphenous Vein (GSV) varicose in combination with involving to its main tributaries is observed in 58% to 65 % of the cases (3, 10). That fact makes the EndoVenous Laser Treatment (Ablation) (EVLT, EVLA) and the EndoVenous Radiofrequency Ablation (VNUS) exceedingly successful for the treatment of Chronic Venous Disease (CVD) (4, 10, 12 and 13).

The potential of the EndoVenous Laser Ablation for the CVD treatment along the GSV was reported for the first time by Min, Navaro and Bone in 2001. Later (in 2003) good results were reported for the endovenous laser ablation when treating varicose small saphenous vein (SSV) (8, 12). Currently the technique is extremely popular in medical practice and thanks to it for several years (2004 –2008) the volume of procedures by the Babcock method in the leading vascular surgery clinics worldwide has been reduced from 60% to 15% (3).

The anatomy of the lower limb varicose veins suggests, though, that the GSV EVLA alone for CVD treatment is perhaps not always efficient enough.

AIM

This study aims at analysing the possibilities for CVD treatment through EVLA alone and in combination with other treatment techniques and the results of the EVLA treatment alone and in combination.

MATERIAL AND METHODS

112 EVLT procedures were done in line with the technique described (2, 3, 4, 11) over a period of 2 years at the Vascular Surgery Department at the "St. Ivan Rilski Hospital", Stara Zagora. Only 39 (34,7%) of them were EVLT alone and the other 73 (65,3%) patients required a combination of EVLT with complementary procedures in order to achieve an optimum healing effect.

All the EVLT patients were treated with a 980 nm wavelength diode laser (Biolitec,

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Germany). The GSV was penetrated with an angiographic guide through the medial malleolus by applying miniincisoin and then a catheter was interpositioned into the insufficient GSV. Having removed the guide, a 0.6 mm laser optic fiber was inserted into the catheter and its tip was located 2 cm proximally from the catheter's end and 2 cm below the sapheno-femoral junction and position of the fiber was echography controlled. After an echography controlled tumescent anaesthesia, 15W maximum power endoluminal laser ablation followed. The quantity of the energy released was some 100 J per centimeter for the first 10 – 12 centimeters and then the energy was reduced to 80 J per centimeter. 12 – 10 W distally reduced endoluminal laser ablation was applied around the knee and distally. We used a technique we modified, where the energy released was reduced to 60 J per centimeter, for the laser obliteration in the lower half of the shank in order to protect the saphenous nerve in that area. The complimentary techniques we had to use simultaneously to the surgical intervention or at different times after the intervention were as follows:

1. Puncture of the lateral varicose veins followed by EVLA with the standard of technique.
2. Miniphlebectomy of reticular varicose veins less than 3 mm.
3. Lipolysis of varicose veins up to 3 mm with thicker laser beams.
4. Sclerotherapy of small varicose veins up to 3 mm with a fluid sclerosant.
5. Foam sclerotherapy of varicose veins over 3 mm in diameter.

Having completed the procedure, all the patients were prescribed elastic medical stockings, second compression class (35mm Hg over the malleolus) and active walking for 2 hours after completing the procedure. According to standard, a low molecular weight heparin prevention treatment was prescribed for 10 days. All the 112 patients were followed up actively on the 24th hour after treatment and on the 7th, 14th and 30th day - 102 of them were followed up for a period of 2 months, 96 for a period of 3 months and 82 for a period of 6 months. At the follow-up examinations the passability of the deep venous system was checked through echography, as well as the condition of the sapheno-femoral junction, the lack of reflux from it and the extent of the obliteration of the saphenous vein. During the follow-up one of the patients (0,9%) was noted to have restored the reflux at the beginning of the GSV below the sapheno-femoral junction and 2 patients (1,8%) had incomplete obliteration of the vein treated. One patient (0,9%) had to be operated on the third month of the follow-up – he had phlebocutaneoectomy along the lateral part of the shank outside the GSV basin due to the insufficient effect of the foam sclerotherapy. The patients' capacity to work and their ability to move were intact during the follow-up period.

We observed the following side effects: objective ones – hardening along the vein, ecchimosis and swelling around the malleolus; and subjective ones – paraesthesia, a sense of tension along the vein and reduced skin sensitivity in the distal part of the shank. It should be mentioned that at the end of the first month of the follow-up the side effects had died down with all the patients. No complications characteristic for that procedure were observed, including deep vein thrombosis.

DISCUSSION

The results we obtained confirmed the advantages of the technique described in the specialized literature but they also confirmed the fact that with only some 1/3 of the patients it can be used alone.

The EVLT advantages – minimal invasion, no skin incision (in the inguinal region and along the limb) and full protection of the lymphatic vessels – make the technique very attractive both for the vascular surgeons and the patients (2, 4, 12) and with combining the above mentioned techniques with a suitable choice of patients it could be a therapy of choice for the treatment of CVI in most of the cases.

The results of the EVLT effect multi-center trials worldwide recorded the superiority of that technique compared to the radiofrequency ablation (VNUS) since with the EVLT complete obliteration of the GSV was present in 98% of the cases over a period of 5 years whereas there were 90% of good results with VNUS over a period of 4 years (3).

The absence of the classic complication – deep vein thrombosis - after EVLT in our results can also be rendered as an advantage of that technique. We think that the lack of traumas after the intervention combined with a 10-day

low molecular weight heparin prevention treatment, active exercise and the elastic compression applied, are the base of the deep vein thrombosis prevention.

There are other more severe complications of the laser treatment described, such as thrombus protrusion from the laser-treated GSV to the deep venous system (12, 13) and the forming of an arteriovenous fistula after the procedure (15) but they are just isolated cases. However, they should be considered during the follow-up period and the ultrasonic testing and should be carefully looked for with the aim of early diagnosis and adequate treatment (12).

CONCLUSION

In conclusion, we should point out the following:

EVLA alone as a treatment technique is applicable in some 1/3 of the patients but its combination with complimentary techniques widens its application capabilities many times.

The lack of complications, the good tolerability of the patients to that technique and the extremely fast recuperation make it a method of choice for the patients and it should be more widely established as a treatment of choice for the vascular surgeons.

Combining EVLA with other techniques in practice makes its capabilities equal to the classic operative treatment and, considering the few traumatic conditions and the results obtained, we think it is the superior one.

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