

# ENDOVENOUS LASER TREATMENT (ELT) WITH 1064 nm ND:YAG IS EFFECTIVE IN OCCLUSION OF SAPHENOUS VEINS

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**Background:** Minimally-invasive treatment of varicose veins is becoming more and more important, since it represents fewer burdens to the patient and health system. The success of the different methods depends on their ability to eliminate reflux at the saphenofemoral junction (SFJ) or saphenopopliteal junction (SPJ) and the incompetent long (LSV) or short greater saphenous vein (SSV). To achieve this, laser endovenous obliteration of the LSV or SSV is becoming widely used.

**Objective:** To demonstrate a novel way of using Nd:YAG 1064 nm laser energy through an endoluminal laser fiber, for the minimally-invasive treatment of truncal varicosities and the elimination of SFJ or SPJ reflux.

**Method:** In a period of two and half years, 525 legs with US detected reflux in the SFJ and GSV or SPJ and SSV were treated, on an outpatient basis, under local anesthesia, with a 1064 nm Nd:YAG laser, emitting a 1 second long burst of pulses in so-called quasi-continuous mode (QCM). In the first 102 treatments, an average laser power of between 15 and 18 W was used, delivering 50 – 70 J of energy to every 1 cm length of vein.

After a review of the results and with reference to the latest experiences of other ELT practitioners, the average applied power was increased to 25 W, delivering an average energy of 170 J/cm into the vein, with the next 423 procedures being performed using these parameters. In all procedures the smaller branch varices were removed by mini phlebectomies.

**Results:** Patients tolerated the procedure well and they were released from the outpatient clinic, with compression stockings (CCL II) applied, immediately after the completion of the procedure. Except for some skin ecchymosis and mild induration, patients did not have any other problems after the treatment. The control US was made 1 week, 4 weeks, 6 months and 1 year after the procedure. At one year after the procedure, from the first batch of 102 legs, 12 legs were detected with partially-recanalized vein segment, i.e. at 1 year after treatment 88.23 % of the LSV or SSV on the treated legs were fully-occluded. Even those patients with incompletely occluded LSV or SSV following treatment were satisfied with the relief of the symptoms. The follow-up of the 423 legs from the second batch (after 4 weeks, 6 months and 1 year) showed only a single partial recanalization, giving an extraordinarily high occlusion rate of 99.8%.

**Conclusions:** Endovenous laser treatment with 1064 nm Nd:YAG laser is effective in occluding the saphenous vein and abolishing axial reflux. The unsuccessful treatment in 12 out of 102 legs was due to insufficient applied energy at the beginning. After increasing the laser power to 25 W and the average delivered-energy to 170.2 J/cm the method showed excellent results, without noticeable changes to the already-mild side effects.



## **Andrej Šikovec, M.D., M.Sc., Consultant Surgeon**

Dr. Šikovec held the positions of Chief Vascular Surgeon at the Novo Mesto Hospital and Chief Surgeon in Celje Hospital, before starting up his own private practice. Currently the position of Assistant Professor on the Cathedra for Surgery at the Ljubljana University Medical Faculty, and is considered a leading vascular surgeon in Slovenia. Dr. Šikovec performs vascular laser surgery procedures on a daily basis and has experience performing these procedures using various laser sources as well as radio-frequency technology. Having performed over 300 procedures in a two year period, he is one of only a few surgeons worldwide who are able to objectively compare surgical treatment modalities. In June 2006 Dr. Šikovec opened Avelana, his own clinic for vascular surgery. Dr. Šikovec often holds presentations on university lectures, seminars and congresses; both domestic and international, and has had more than 30 scientific articles published in Slovenian and international medical journals. He is a member of various domestic and international professional organizations and has completed additional professional trainings in the UK and the Czech Republic.