wavelength of two microns. The aim of the study was to compare morphological changes of the great saphenous vein (GSV) wall after exposure to laser radiation with wavelengths of 1550 nm and 1940 nm at different linear energy densities.
Methods. IRE-Polus lasers (registered No. RZN 2013/850, Russian Federation) generating radiation in the range of 1550 nm and 1940 nm, Biolitec two ring radial fibres, and automatic extractor IRE-Polus were used in this study. Segments of the GSV 4—6 mm in diameter and 5 cm long were extracted during phlebectomy, washed, and fixed in a transparent cuvette filled with saline. A laser fibre was introduced into the lumen of the vein. Automatic fibre pull back was performed after laser activation. Different power settings were used providing a different linear energy density. After EVLA the vein segment was fixed in 10% formalin and underwent histological analysis. A total of 68 GSV segments were analysed.
Results. The 1940 nm wavelength laser damaged the wall of an isolated GSV segment significantly deeper compared with the 1550 nm wavelength laser at the same linear endovenous energy density (LEED). The same depth of the vein wall damage required significantly less LEED. These results suggest potential clinical advantages for a 1940 nm wavelength for EVLA.
Conclusion. Laser with 1940 nm wavelength provides sufficient damage to the GSV wall at a significantly lower LEED, which may have a number of clinical (less pain, lower incidence of paresthesia) and technical advantages (less tumescent anaesthesia needed). Appropriate clinical studies will evaluate whether a 1940 nm wavelength laser has significant clinical benefits to become a new standard in EVLA.

Mid Term Results, Complications and Their Treatment After Cyanoacrylate Embolisation of Saphenous Veins

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Background. The results of cyanoacrylate embolisation (CAE) of the great (GSV) and small (SSV) saphenous trunks in patients with varicose veins (VVs) of the lower limbs were evaluated.
Methods. This is an ongoing prospective observational study that started in 2017 at the Hospital Neftyanik, including patients with VVs who underwent CAE of the GSV and/or SSV by VenaSeal technology. Patients are followed with clinical and ultrasound evaluation at one week, three, six, and 12 months after surgery, and then every year. Efficiency criteria are the technical success of the vein occlusion; absence of recanalisation; GSV stump length; vein involution; absence of truncal reflux; absence of reflux at the junction; no need to remove tributaries; no need for re-intervention on the trunk; clinical class by CEAP; and disease severity by VCSS. Safety criteria are the absence of adverse effects (AEs).
Results. Between 2017—2019 CAE was performed on 122 limbs of 92 patients: 46 women and 46 men aged from 28 to 69 years (mean age, 45.3 $\pm$ 10.3 years) with the CEAP clinical of C2 (47.6%), C3 (35.2%), C4 (16.4%), and C5 (0.8%). The GSV trunk (diameter 4.5—18.0 mm; mean 9.0 $\pm$ 2.5) was treated in 82% and the SSV (3.7—13.0 mm; mean, 7.0 $\pm$ 2.3) in 18%. Technical success was achieved in all cases. The lengths of the GSV stump varied from 0 to 48 mm (mean, 19.0 $\pm$ 9.7). Sclerotherapy for varicose tributaries during the first three months was performed in 55 legs (45.1%). Patients were followed for three months (range one week—18 months). Additional sclerotherapy for varicose tributaries was required for 35 limbs (28.7%). Truncal recanalisation $>$ 5 cm was found in eight limbs (6.6%) 3—12 months after intervention and required second CAE (n = 1), laser ablation (n = 1) or sclerotherapy (n = 4). Other AEs that did not require re-intervention were GSV trunk phlebitis (n = 8; 6.6%) or tributaries (n = 5; 4.1%), allergic reaction (n = 4; 3.3%), cord sensation (n = 5; 4.1%), glue propagation to the junction (n = 2; 1.6%), glue propagation out of the junction (n = 2; 1.6%), altered sensation (n = 4; 3.3%), and puncture site haematoma (n = 1; 0.8%).
Conclusion. CAE is an effective method for saphenous vein ablation that is associated with an acceptable incidence of non-severe AEs with a low rate of re-interventions.

Long Term Results of Catheter—Directed Thrombolysis of Iliofemoral Thrombosis

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Background. The aim of the study was to evaluate the long term results of catheter directed thrombolysis (CDT) in patients with acute thrombosis of the iliofemoral segment.
Methods. This was a single centre prospective observational study started in 2016. Twenty-eight patients (58.2 $\pm$ 6.7 years; 64% women) with acute deep vein thrombosis involving the iliac or common femoral veins were included. The inclusion criteria were primary iliofemoral thrombosis confirmed by duplex ultrasound. Patients with contraindications to thrombolytic therapy were excluded. Twenty-eight limbs were treated by CDT with Alteplase under fluoroscopic guidance with a McNamara infusion catheter (Medtronic, USA). Alteplase was administered as a 10 mg bolus followed by a 1 mg/h infusion. The total dose of thrombolytic did not exceed 50 mg. Angiographic control was performed every 24 hours. Control phlebography was performed at the end of the procedure. Long term results were analysed in 24—28 months in all patients. Ultrasound was used to evaluate primary vein patency and deep vein reflux. The presence and severity of post-thrombotic syndrome (PTS) was assessed using Villalta scale.
Results. Immediate CDT technical success was observed in 24 (86%) patients. In 8 (29%) patients, CDT was supplemented with iliac stenting. At 24 month 96% of segments (27 limbs) were patent, in 7 (25.1%) cases venous reflux was detected. Moderate PTS (Villalta score $\geq$5) was detected in 9 patients (32%), 19 patients (68%) were free from PTS. At two years the mean Villalta score was 3.8 $\pm$ 0.9, and in 19 patients (79%) it was $\leq$5. There were no cases of severe PTS (Villalta $\geq$15).
Conclusion. CDT prevents PTS and significantly reduces PTS severity in patients with acute iliofemoral thrombosis.

Comparative Analysis of Stenting and Hybrid Operations in Chronic Venous Obstruction of Iliofemoral Segments in Patients with Postthrombotic Syndrome

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Background. The aim of the study was to compare results of stenting and hybrid operations in chronic venous obstruction (CVO) of iliofemoral segments (IFS) in patients with severe post-thrombotic syndrome (PTS).