

ORIGINAL ARTICLE

Modern possibilities of usage of the endovenous welding in the treatment of patients with chronic venous diseases: method basics and applications results

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ABSTRACT

BACKGROUND: We offer the method of endovenous welding, in which the ablation of incompetent saphenous trunks executed under the influence of high-frequency current in automatic mode with relatively low heating. The aim of this study was to analyze the results of elaboration and clinical application of the endovenous welding.

METHODS: The impact of the endovenous welding was studied during the bench tests on remote segments of vena saphena magna with determination of electric parameters, temperature and morphological changes. The results of application of the method in 116 operations of 87 patients with chronic venous diseases C2–C3 (CEAP) were determined. Endovenous welding was executed in accordance with generally accepted methodology. Criteria for evaluating of the results: the intensity of postoperative pain, ultrasound data, complications.

RESULTS: The welding in each of different areas of veins has been lasted for 12 seconds with heating to 55–80 °C, resulted in denaturation of the venous wall without damage of paravasal fatty tissue. The absence of postoperative pain was detected at 67 (57.7%) cases, moderate pain – at 49 (42.3%). After the 6-month fibrosis of target veins was detected in 116 (100%) cases. No complications were detected.

CONCLUSIONS: Endovenous welding allows to perform the controlled ablation based on denaturation of the venous wall. The results of the application of method are encouraging fibrosis of the target veins during the observation period of 12 months were obtained in 100% of cases. The automatic mode of welding provides relatively low heating, eliminates the influence of subjective factors on the ablation results, which makes it possible to use method including patients with large diameter veins.

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KEY WORDS: Endovascular procedures; Laser therapy; Welding.

Problematic methodological aspects of application of endovascular laser ablation (EVLA) and radiofrequency ablation (RFA) in the treatment of chronic venous diseases (CVD), which are associated with high temperature exposure and the risk of burn, thrombotic and neurological complications, variability of choice of energy parameters^{1, 2} predetermine the relevance of the search for a new method of thermal ablation with less heating of tissues and a more sophisticated control algorithm. We believe that the

suggested method of endovenous welding (EVW) is the most appropriate to these criteria.

The idea of using of electro-thermal effects in the treatment of CVD was first suggested by Firt, Heigal, Jrivora in 1959. The method was called endovenous electrocoagulation (EEC) and involved the use of a monopolar catheter that warmed up under the influence of an electric current and caused the coagulation of the venous wall.³ However, the method was not widely accepted due to numerous