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The immediate effects of endovenous diode 808-nm laser in the greater saphenous vein: morphologic study and clinical implications.

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Abstract

BACKGROUND: We conducted this study to evaluate the immediate venous morphologic alterations produced in the great saphenous veins by the endovenous diode 808-nm laser used for the treatment of superficial venous insufficiency and varicose veins of the lower limbs and to clarify the clinical implications of the histologic findings.

METHODS: Chosen for the study were 24 limbs of 16 patients with CEAP classification 3 to 6, ultrasound-documented greater saphenous insufficiency, and venous diameters between 3.9 mm and 17 mm (mean, 8.04 mm) without phlebitis, saphenous aneurysms, congenital malformations, or deep venous insufficiency. All limbs underwent surgical saphenofemoral disconnection, and the greater saphenous vein was treated with an endovenous diode 808-nm laser by continuous emission at 8 to 12 W and variable retraction speed (</>1 mm/s). Spinal or local, but not tumescent, anesthesia was used. Twenty-nine specimens (3 to 5 cm long) of 24 proximal greater saphenous and five anterior accessory saphenous veins were excised and studied by light microscopy for diameter and thickness of the venous wall, extent of injury into the intima, media, and adventitia, as well as penetration of thermal damage.

RESULTS: The histologic evaluation showed thermal injury to the intima in all specimens and full-thickness intimal injury in 22 specimens (75%); the average penetration of thermal injury in 29 specimens was 194.40 microm (range, 10 to 900 microm; 14.61% of the mean wall thickness); complete intimal circumference injury occurred in 8 specimen veins <10 mm in diameter (27.5%), full thickness damage in 6 (20.7%), and perforation in 2 (6.9%).

CONCLUSIONS: Saphenous ablation using 808-nm laser by variable retraction speed, combined with saphenofemoral interruption, leads to sufficient vein wall injury to assure venous occlusion. Full thickness thermal injury or perforation is infrequent. Optimal results can be obtained in veins <10 mm in diameter.

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