COMPARISON OF ENDOVENOUS SAPHENOUS VEIN OBLITERATION TECHNIQUES: 810 nm VERSUS 1320 nm VERSUS RADIOFREQUENCY

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Background and Objective: A number of techniques for endovenous laser ablation and occlusion of saphenous veins have been utilized. These include 810 nm as a hemoglobin specific wavelength and radiofrequency (RF) as a method to contract collagen by heating the vein wall. The objective of this study was to compare the effects of a water specific 1320 nm wavelength to a hemoglobin specific wavelength of 810 nm and use of RF for thermally induced vein wall contraction.

Study Design/Materials and Methods: The treatment of 36 saphenous veins with the 810 nm wavelength was compared to the treatment of 42 saphenous veins with the 1320 nm wavelength and 174 saphenous veins with fast pullback at 90 C with RF. Results were evaluated by Duplex ultrasound at 1 day, 1 month, 6 months and 1 year. Endovenous occlusion was performed using single puncture cannulation of the treated vein with duplex guided tumescent anesthesia. The 810 nm was performed by manual pullback and the 1320 nm by motorized pullback at 1 mm/sec. RF pullback was guided by temperature feedback from the embedded thermocouple feedback loop.

Results: Treatments were analyzed for post-operative pain, bruising and efficacy of occlusion of the saphenous system. 810 nm had the highest incidence of side effects with 19/36 (52%) experiencing significant pain interfering with walking for 2–3 days and 99% with significant bruising covering 75% or greater of the treated area. Success at one year was 31/36 or 86%. Pullback time averaged 3 minutes. For RF using fast pullback at a setting of 90ºC as target temperature, the average time of pullback was 7.14 minutes. Success rate was 95% and significant pain and bruising was 0%. For 1320 nm, side effects of bruising and pain were 0% similar to RF, pullback was automatic and averaged 5.21 minutes. Success rate was also 95% at one year.

Conclusions: The 1320 nm wavelength specific for water absorption with automatic pullback delivers predictable contraction of the vein with far fewer side effects than 810 nm. Results are similar to RF. Patient satisfaction and immediate post-operative results are best with the 1320 nm Nd:YAG laser and RF although long-term outcomes are similar with both wavelengths. The 810 nm diode has the highest side effect rate with the lowest long term success rate.