ENDOVENOUS LASER ABATION AND FOAM SCLEROTHERAPY: EXPERIENCE IN 450 CONSECUTIVE PATIENTS

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Purpose
Endovenous laser ablation (ELA) is a well-established alternative to surgery in the treatment of truncal and perforating vein insufficiency. After the remaining truncal or perforating vein is ablated, the remaining varicosities are either removed with sclerotherapy, or alternatively, treated with sclerotherapy (1-3). Sclerotherapy is traditionally performed using liquid agents, but foam sclerotherapy is becoming more and more popular (4). In the literature, there is little data on concomitant use of foam sclerotherapy following ELA (4). In this single-center series, we present our experience in 450 patients in whom ELA and foam sclerotherapy were performed in the same session.

Methods
Between July 2005 and March 2010, concomitant foam sclerotherapy of the varicose veins were performed in 450 out of 510 patients who underwent endovenous laser ablation for truncal and/or perforating vein insufficiency. Demographic and clinical data of these patients are presented in Table 1.

In all patients, ELA was performed with US guidance under local tumor necrosis. In 157 patients, a femoral or sciatic nerve block was also done to provide better analgesia. In patients with bilateral disease, ELA was performed in both extremities (Table 2). Depending on the diameter of the refluxing veins, 50-90 Joul/cm energy was given during the laser ablation. After all ELA procedures were completed (unilateral or bilateral), the remaining varicosities were treated with ultrasound-guided foam sclerotherapy (USGFS). For USGFS, first, multiple butterfly needles were placed into the varicosities under US guidance with the patient in the reverse Trendelenburg position. Then, a thick foam was prepared according to the Tasker method, using a mixture of 1%-3% podoacetic acid and air in a 1:4 ratio. The foam was then injected via the butterfly needles into the varicosities under US guidance with the patient in a slight Trendelenburg position (Figure 1).

Whenever possible, the foam was intentionally directed into the laser-ablated veins to create additional ablation of the refluxing veins with the foam. When all the varicosities were filled with echogenic foam, the injection was stopped. The patient then put on compression stockings and walked for 20-30 minutes.

Follow-up color Doppler US were performed at 1, 6 and 12 months.

Results
ELA was technically successful in all cases although another venous puncture was necessary in 30 patients devoleped dry calf vein thrombosis. In our experience, concomitant use of foam sclerotherapy (1-3) is most commonly preferred in the treatment of pelvic-gonadal vein insufficiency and for the ablation of remaining varicosities after ELA of truncal and perforating veins (4). In the literature, we could find only 2 studies reporting the combination of ELA and USGFS after ELA (4.6). In both, the combined treatment was associated with a high success rate (98-100% closure of the refluxing veins) and a low complication rate. Similarly, during the 1-48 months follow-up, we have seen only 2 patients with recanalization of the refluxing veins in our study. We believe that routine Doppler US follow-up of all patients including the asymptomatic ones, repeated USGFS of varicose veins until no reflux was seen and intentional manipulation of the foam into the laser-ablated veins to create additional ablation after ELA may have decreased the recanalization rate in our series.

In our study, we saw some minor complications immediately after USGFS including coughing, nausea/vomiting and transient visual disturbances, which invariably resolved within 15-20 minutes after the procedure. Other minor complications included hypopigmentation and telangiectatic matting (due to foam sclerotherapy) which mostly resolved within one year, and transient panneumia (due to ELA) which resolved within 4 months. In our study, major complications occurred in 8 legs (1.8%). Skin necrosis was seen in 5 legs and healed within 4 months, although systemic and topical antibiotics were necessary in 3 cases. Cali vein thrombosis was seen in one of the crural veins in 3 legs. In all patients presented with ankle swelling several days after the procedure, and successfully treated with low molecular weight heparin. In our study, we took some measures to reduce the risk of deep vein thrombosis. 1. Instead of injecting a large volume of foam in a single puncture, we injected small volume punctures (1-2 ml) at a time. 2. We avoided injection near to perforating veins. 3. When we saw filling of the deep veins with foam, we stopped the injection at that site and only performed ELA. 4. We performed USGFS after all ELA were finished, and made the patient walk for 20 minutes immediately after the procedure. 5. We instructed the patient to be active (walking or performing foot exercises) for at least 4 hours after each USGFS session. In our experience, concomitant use of USGFS with ELA provides some advantages: First, since the refluxing vein and the varicosities are treated in the same session, the total duration and cost of the treatment are reduced, and the period of compression stockings is shortened which is preferred by the patient. Second, if the varicose veins are intertwined following ELA, they may be thrombosed due to stagnation. This may complicate or interfere with the subsequent sclerotherapy (or phlebotomy) and may require anticoagulant treatment. USGFS performed shortly after ELA prevents this complication. And third, passage of the foam from the varicose veins into the laser-ablated refluxing truncal or perforating veins creates an additional ablation, and this may result in a more durable occlusion.

In conclusion, endovenous laser ablation and concomitant USGFS is feasible and effective. The procedures are associated with a low complication rate and can be performed in both legs in the same session. Concomitant use of laser and foam may potentially decrease the recanalization rate of laser-ablated veins.

References:

Figure 1. US-guided foam sclerotherapy.