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USG GUIDED EVLT PLUS INJECTION SCLEROTHERAPY - AN EMERGING SOLUTION FOR VARICOSE VEINS

General Surgery

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ABSTRACT

Objective: The aim of the study is to emphasize upon the feasibility of EVLT with foaming sclerotherapy in patients with varicose veins along GSV and SSV. Background: Varicose veins are common affections of lower limbs and so, significantly affects quality of life of the person. The literature shows the treatment of the disease has evolved, especially since 1990, when laser energy was first applied to ablate the involved veins. **Materials and methods:** We present our findings in 8 patients in whom, USG guided EVLT and injection sclerotherapy was performed and results tabulated since February 2021- May 2022. **Results:** USG guided EVLT and foaming sclerotherapy have been individually tried in patients of varicosity. But, when applied cumulatively, has challenged the results achieved with other surgical options available. **Conclusion:** Our study on 8 patients has further strengthened the efficacy USG guided EVLT and injection foaming sclerotherapy conjure up in the cure of varicosity of lower limbs.

KEYWORDS

EVLT, injection sclerotherapy, USG, varicose veins

INTRODUCTION:

Varicosity of lower limbs are common, affecting 15% males and 35% females. Pathophysiology ranges from venous valve defect with pooling of blood in the lower extremities leading to gradual dilatation of the superficial venous system and symptoms of thinness of parts of veins with rupture. Chronicity leads to lipodermatosclerosis to phlebitis to ulcers. The disease has believed to affect people having long standing hours.[1,2]

To evaluate the severity of the disease, CEAP[Clinical, Etiological, Anatomy, Pathophysiology classification still remains the gold standard:

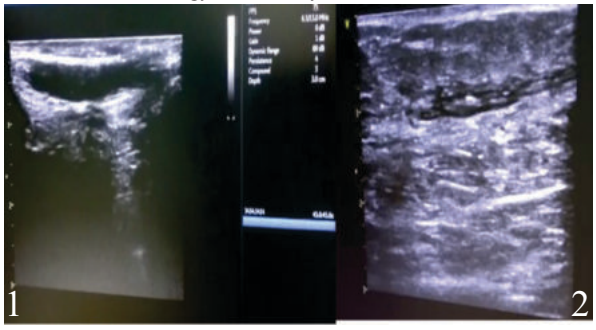
Courtesy: veno.com.hk/varicose-vein.html Till 90s, foaming sclerotherapy, high ligation and stripping of great saphenous vein, multiple perforators ligation were commonly practised procedures to treat varicose veins. In 1999, Dr Luis Navarro, Dr Carlos Bone and Dr Robert Min took the initiative to use 810nm laser for treating varicose veins. Following this, 980nm came into use, until it was realised that 15W 1470nm diode laser interacts with water more than blood at a lower energy and so, has targeted action on vessel wall rather than absorbed in blood. Also, pain scores were less for the latest wavelength used. USG guided sclerotherapy in conjunction has undoubtedly challenged the curative benefits of high stripping and ligation of saphenous veins and perforators, with added perks of minimally invasive technology and early recovery.

Endovenous laser ablation is basically an USG guided therapy to injure venous endothelial cells leading to fibrosis. This offers less complications in terms of skin necrosis, surgical scarring, less bleeding etc.

Aims and objectives: The aim of the study is to establish the procedure- USG guided EVLT plus injection sclerotherapy in treating varicose veins in increasing number of patients in future. Limitation: The authors, accept the fact that with limited number of patients, our documentation is an addition to the series of patients tested with the procedure in the literature search. We moreover assert the steps, and thus the virtue of treating varicose veins with EVLT of GSV, SSV, accessory veins plus injection foaming sclerotherapy.

Methodology:

After pre-anaesthetic fitness and work up, 8 patients underwent the treatment under spinal anaesthesia and supine position. All patients were confirmed to have normal arterial flow and no evidence of deep venous thrombosis. USG guided 20Gauge needle of radiointroducer kit [Terumo] was inserted and retrograde flow of blood confirmed[Figure 1]. Guide wire was then introduced and sheath along with dilator was rail roaded. The skin may have to be incised a bit with 11number blade. Guide wire is withdrawn and radial fibre is introduced to cannulate the vein involved [GSV or SSV or straight accessory veins]. Tumescence [20milliequivalents soda bicarbonate mixed with 500millilitres normal saline] was injected in the subcutaneous tissues along the length of veins, so as to prevent injury to bystanding important neurovascular structures. The laser settings were on impulse mode, delivering 64Joules/centimetres energy and 8seconds pause for above knee veins and 36Joules/centimetres energy and 6seconds pause for below knee veins. The laser[Lasotronix smart^{m}] firing and post ablation venous flow was confirmed with ultrasound[Figure 2]. The laser fibre is pulled continuously after every beat of impulse mode, until the black strip on the radial fibre appears which marks the time to withdraw sheath and further, the fibre is pulled with every beat of impulse mode, until the second black strip on the fibre is seen, which marks the end of vein. The firing should be stopped here to avoid skin necrosis. Till this procedure is taking place, another assistant prepares for foaming sclerotherapy. Maximum of 4millilitres of sodium tetradecyl sulphate(60milligrams/2millilitres) with air and normal saline were included in the preparation. USG guided cannulation of various damaged accessory veins were done and sclerosant injected[Figures 3 and 4]. Straight accessory veins can be ablated with laser energy alternatively.



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USG guided cannulation of great saphenous vein

Laser radial fibre tip seen on USG while withdrawal

Massaging was done while pressure applied over SFJ and SPJ, so as to avoid damage to the deep veins by the sclerosant. Crepe bandage pressure was applied over gamjee roll was applied as dressing.

Leg elevation for 24hours, followed by compression stockings(grade II- 15-20millimetres of mercury) for 10-12hours a day for 3months were advised. Physical exercises were allowed after 1week.

Figures 1-4 [from upper left clockwise]

RESULTS: Statistical data were tabulated using means.

Table 1

S. No.	Demography [Age/Sex]	Complaints and history	Clinical Diagnosis [On CEAP basis]	Follow up after 3 weeks of surgery	Follow up after 6 weeks of surgery
1	40years/Male	Pain, swelling, hyperpigmentation, recurrent ulcers, Occupational history of army personnel	C5SESASPPR	Doing well, no complaints	Doing well, no complaints
2	27years/Female	Pain, swelling, Occupational history of housewife	C2SESASPR	Doing well, no complaints	Doing well, no complaints
3	30years/Male	Pain, swelling, large ulcer, Occupational history of labourer	C6SESASPPR	Doing well, ulcer healed, no complaints	Doing well, no complaints
4	40years/Male	Pain, swelling, hyperpigmentation, recurrent ulcers, Occupational history of labourer	C5SESASPPR	Doing well, no complaints	Doing well, no complaints
5	55years/Male	Pain, swelling, hyperpigmentation, Occupational history of retired engineer	C4SESASPPR	Doing well, no complaints	Doing well, no complaints
6	32years/Male	Pain, swelling, hyperpigmentation, recurrent ulcers, Occupational history of labourer	C5SESASPPR	Doing well, numbness along ankle	Doing well, sensations improved but not completely normal
7	25years/Male	Pain, swelling, hyperpigmentation, recurrent ulcers, Occupational history of army personnel	C5SESASPPR	Doing well, complained of a remnant swelling below knee	Doing well, USG guided sclerotherapy done in remnant accessory vein
8	18years/Male	Pain, swelling, Occupational history of student [had job recruitment concerns]	C2SESASPPR	Doing well, no complaints	Doing well, no complaints

DISCUSSION:

USG guided EVLT + injection sclerotherapy offers the capability of yet another minimal access technique.[3,4] This offers a safe and efficient treatment option with reduced complications. 15W 1470nm is a diode laser and the heat generated produces steam bubbles causing damage to endothelium and the layer beneath resulting in coagulative necrosis and occlusion of veins. Studies have proven that histological examination at 3 and 6months after EVLT suggest failure of endothelial regeneration.[5,6]

A continuing education activity on "varicose veins" written by authors Meghal R Antani; Jeffery B Dattilo concluded that RFA and EVLT are equally successful in treating the ailment with fewer side effects with RFA. They also stressed the importance of excluding DVT before surgery and post operative care, especially compression stockings usage for more than 2weeks. Wasim M D, Azeez Pasha et al in 2018 demonstrated EVLT with foam sclerotherapy. They used 980nm bare and radial fibres and inferred that bare fibre is less effective and can cause perforation of vessel wall. They recommended usage of EVLT with foam sclerotherapy below knee to avoid nerve injury. Butros Karam, Fady Haddad et al in 2009 and Gang Cao, Han-Cheng Gu et al in 2019 studied the curative effects of EVLT over high ligation and stripping of varicose veins.

CONCLUSION:

Considering safety and curability, USG guided EVLT and foaming sclerotherapy offers a promising treatment option for lower limbs varicose veins, in the arena of minimal access surgeries.

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Abbreviations:
DVT- Deep venous thrombosis
EVLT- Endovenous laser therapy/ablation
GSV- Great saphenous vein
RFA- Radiofrequency ablation
SFJ- Sapheno femoral junction
SPJ- Sapheno popliteal junction
SSV- Short saphenous vein
USG- Ultrasound

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