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Radiology

KEY WORDS: EVLA, varicose veins, venous ulcers, ablation.

A REVIEW OF ENDOVENOUS LASER ABLATION OF VARICOSE VEINS, EFFICACY AND IMMEDIATE, DELAYED AND LONG TERM COMPLICATIONS.

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ABSTRACT

A retrospective study to analyse the efficacy of Endovenous Laser Ablation(EVLA) in patients of lower limb varicose veins and venous ulcers, with varying professions, calculated on the basis of immediate, delayed and long term complications. 20 patient's data was retrospectively analysed with procedures carried out between 1st Jan 2017-30th Sep 2017 and followed up till 30th Sep 2018. In our study, we found results to be more efficacious as compared to conventional methods of stripping and ligation, higher patient compliance and very few post procedural morbidities. With standardisation in the method, ready availability of skilled interventional radiologists and necessary equipments, EVLA is poised to be mainstay method in treatment of varicose veins and venous ulcers.

INTRODUCTION

Varicose veins is a lifestyle disease and commonly affects patients in the age group of 30-70 years. In our country it is commonly seen to affect patients who are farmers, traffic policemen, doctors, medical health workers such as ward boys and nursing staff. the common risk factors include prolonged hours of standing, chronic venous insufficiency, obesity, smoking among others. The etio-pathogenesis of the disease is [1]weakness in the walls of veins, [2] causing stasis of venous flow and peripheral pooling as seen by dilated veins, [3] elicited by abnormal venous remodelling. Complications can be several as per the degree of involvement and can manifest as simple skin discolouration and sinister as chronic non healing venous ulcers, thrombotic disease and haemorrhage. Treatment usually involves lifestyle modifications, cessation of smoking, weight loss, surgical method of stripping and ligation and relatively newer method of EVLA. EVLA was first described by Magi G et al, though its popularisation is largely attributed to Dr. Carlos Boné.

MATERIALS AND METHOD:

20 patients who came to the Interventional Radiology OPD with great saphenous (GSV)and/or short saphenous(SSV) varicose veins and/or non healing venous ulcers; between 1st jan 2017-30th sep 2017 were suggested and underwent the day care procedure of EVLA and were followed up till 30th jan 2018. Patients of any age, gender and profession who were willing for EVLA were included in this study. Complications were defined broadly into 3 categories 1 Immediate complications (within 6 hours of the procedure), 2 delayed complications (1 month after the procedure and 3 long term complications (1 year follow up). Immediate complications were defined as swelling, pain and thrombus formation; delayed complications as thrombus formation and or dilated veins in the treated lower limb arising from or the previously untreated vein and long term complications as recanalisation of vein, recurrence of varicosities and need to repeat procedure.

Criteria for assessment:

A. Immediate Complications

1 Pain
2 Local hematoma
3 Parasthesia

B. Delayed complications

1 Thrombus formation in Deep venous system
2 Swelling
3 Dilated veins
4 Ulcer healing

C. Long term complications

1 Recanalisation of vein by collaterals
2 Recurrence of Varicosities
3 Repeat EVLA/Surgical intervention

Procedure

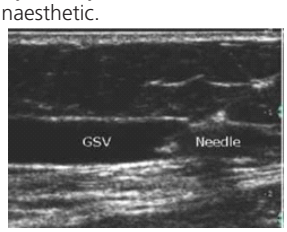
For GSV: The patient is placed in supine position, the affected lower limb is abducted and flexed at the knee for easier access of the GSV along the limb's medial aspect.

Under antiseptic precautions, painting and draping is performed, under the guidance of Ultrasound machine (Ge Logiq P5, linear probe 10-12) GSV is isolated, local anaesthetic such as lidocaine 2% is given at the caudal most part of GSV and then superficially around it. Vein is then punctured using a vascular access kit. Once puncture is achieved, the dilator is introduced and the vascular sheath is advanced. After removing the dilator treatment sheath is introduced upto 5cm from Sapheno-femoral junction. Next, tumescent i.e. anesthesia is administered using an IV set all along the course of GSV under US guidance so as to visualise the GSV within a dark pool of anaesthetic. The laser fiber is then introduced through the sheath in place. An appropriate wattage on the laser generator is selected (Lasotronix 15W/1470nm) (7-8 watts above knee joint and 5 watts below knee joint), and the laser fiber is activated via foot pedal. Care should be taken to continually withdraw the fiber at a pullback rate of 5mm/s, while monitoring the ablation response via US. The patient may feel warm at the ablation site and if the pain is unbearable tumescent can be injected or cold saline gauze pieces can be put directly above the ablated site. The ablation is stopped as the fiber tip approaches the puncture site, the sheath is removed and the distal most part is ablated gradually. Care is taken to prevent superficial injury to the skin and subcutaneous tissue in the caudal most part.

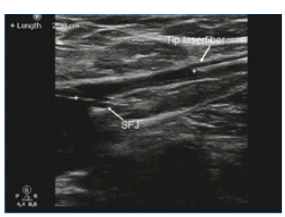
After the procedure, a quick reconnaissance Doppler was done to see the response and immediate complications. Compression bandages are applied from the ankle to the groin, along with application of full-length compression stockings.

For SSV: The patient is put in prone position and under ultrasound guidance a puncture is made in the distal most part of SSV and the aforementioned procedure is repeated.

Tumescent: It is a mixture of 440cc normal saline, 25cc 1% lidocaine and 10cc 7.5% sodium bicarbonate mixed in a kidney tray and injected around the vein to be ablated. It acts as a local anaesthetic.

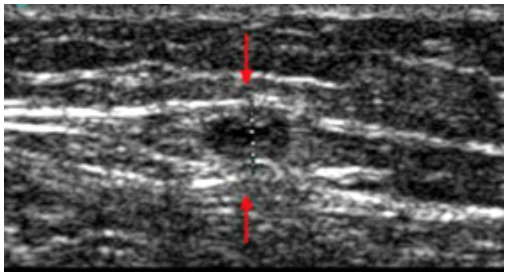


US guided puncture of GSV.



Laser fiber is retracted by upto 5 cm away from Sapheno-Femoral Junction.

GSV seen within Anechoic collection of tumescent.



Echogenic occlusion of GSV after EVLA noted.

Observations:

Patient Demography and Presenting complaints

Case No.	Lower limb side	Age	Sex	Occupation	H/O prolonged standing	Swelling	Discoloration of the skin	Ulceration	H/O any previous procedure (Surgical)
1	R	31	M	Farmer	Yes	localised	Yes	No	No
2	L	54	M	Farmer	Yes	localised	Yes	No	Yes
3	R	66	M	Farmer	Yes	localised	Yes	Yes	Yes
4	R	69	M	Farmer	Yes	localised	Yes	Yes	Yes
5	B/L	58	M	Surgeon	Yes	localised	Yes	No	No
6	L	42	F	Cook	Yes	localised	No	No	No
7	L	48	F	Cook	Yes	localised	No	No	No
8	B/L	55	M	Shopkeeper	Yes	localised	Yes	Yes	Yes
9	B/L	48	M	Constable	Yes	localised	Yes	Yes	No
10	R	52	M	waiter	Yes	localised	Yes	No	No
11	L	56	M	Shopkeeper	Yes	localised	Yes	No	No
12	B/L	34	F	air hostess	Yes	localised	No	No	No
13	R	72	M	Farmer	Yes	localised	Yes	Yes	Yes
14	R	28	M	waiter	Yes	localised	No	No	No
15	L	39	F	Anaesthetist	Yes	localised	No	No	No
16	R	45	M	Constable	Yes	localised	Yes	Yes	No
17	L	65	F	Cook	Yes	localised	Yes	No	Yes
18	R	59	M	ward boy	Yes	localised	Yes	No	No
19	B/L	40	F	nurse	Yes	localised	No	No	No
20	R	39	M	Constable	Yes	localised	No	No	No

In our study it was observed, that all the patients had a history of prolonged standing and localised oedema thereby this being a lifestyle disease and affects one in disbursing their professional activities. Out of 20 patients, 6 patients had undergone surgical procedures and had unfavourable outcomes in the long term. Prognosis was increasingly unfavourable with advancing age and venous ulceration.

Case No.	Venous ulcer	Stripping and Ligation	Ulcer debridement
1	Absent	Yes	No
2	Present	Yes	Yes
3	Present	Yes	Yes
4	Present	Yes	Yes
5	Absent	Yes	No
6	Yes	Yes	No

The patients were then scheduled for EVLA and assessed with US guided colour doppler immediately after the procedure, 1 month after the procedure and after 1 year of the procedure

Immediate Complications:

Total Cases	**Pain**	**Local Hematoma**	**Parasthesia**
20	18	15	5
Percentage	90%	75%	25%

Delayed Complications

Total Cases	Thrombus Formation in deep veins	Swelling	Dilated veins	Repeat Procedure
20	0	2	2	2
Percentage	0	10%	10%	10%

Cases with Chronic Ulcers	Showing signs of healing	No resolution
6	4	2
Percentage	66.66%	33.33%

2 patients with previously non healing ulcers, had developed swelling, thrombus formation in deep veins and also showed dilated collateral veins and were subjected to repeat procedure and ablation of SSV was also carried out.

4 out of 6 patients with ulcers showed resolution in their symptoms and ulcer wound had started to heal.

Long term complications:

Total Cases	Recanalisation	Recurrence of varicosities	Repeat Procedure/ intervention
20	0	2	2
Percentage	0	10%	10%

RESULTS:

As per our study criteria, 90% of patients have had complete resolution in their symptoms.

2 cases(10%) which had to undergo repeat procedures were patients of advanced age with chronic non healing ulcers and extensive collateral network. In such cases, it is advisable to trace the collaterals arising from Superficial venous system and Deep venous system and if need be conduct EVLA in both SSV and GSV at a suitable interval.

Patient compliance had markedly increased in other cases of non healing ulcers(4 cases,75%) with previous surgical intervention, they showed signs of healing on monthly follow up and complete resolution after 1 year.

Patient compliance was also found to be higher as the procedure was aesthetically pleasing, less painful and resolution of symptoms was quite frankly immediate.

CONCLUSION:

Collectively our results show EVLA is less traumatising procedure

and shows promising results in being the mainstay method of treatment of varicose veins than conventional surgical methods. Standardisation of technique, ready availability and reasonable cost of machinery involved is the need of the hour.

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