

## **An Experience with Colour Doppler Guided Foam Sclerotherapy in the Management of Varicose Veins of Lower Extremity**

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### **Original Research Article**

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**Abstract:** Colour Doppler guided foam sclerotherapy is supposed to be a viable option in the treatment of varicose veins of lower extremity. It can be undertaken as OPD procedure with early return to normal activities and without any need for general anaesthesia.

**Keywords:** Colour Doppler, general anaesthesia, varicose veins, Sclerotherapy.

### **INTRODUCTION**

Sclerotherapy involves injection of a sclerosant solution in the lumen of the varicose vein. The solution causes inflammation of the intimal layer of the vein wall which ultimately adheres to each other obliterating the vein. In foam sclerotherapy much larger quantity of the drug can be used. Foam minimises thrombosis by pushing the blood out of site of the vessel where action is needed. Air get absorbed between foam and the endothelial lining is destroyed. Ultrasound guidance can increase the precision and efficacy of the procedure.

Consequently, the present study has, therefore, been undertaken to define and establish the role of ultrasound guided foam sclerotherapy as well as to define its complications in the management of varicose vein of the lower extremity.

### **MATERIALS AND METHODS**

The study was conducted on 60 patients (42 male and 18 females) of varicose veins of lower extremity attending surgical OPD of Patna Medical College and Hospital from Jul 2016 to Jun 2017.

Written informed consent were taken from all the patients. Only those patients were selected for the study who had symptomatic (CEAP score 2-6) venous disease and shown significant reflux (>.5 second) on ultrasound study. The treatment was not offered simply for cosmetic reasons. The patients with evidence of deep vein thrombosis were excluded from the study.

The procedure was undertaken as an outpatient procedure in the ultrasound room. Foam was prepared by taking 1 ml of Sodium Tetradecyl sulfate (STD 3%) with 4 ml of air in a 5 ml syringe. The syringe was connected to another 5 ml syringe with a three way stopcock. 20 alternative movements from one syringe to the other will prepare 5 ml of foam. 30 ml of such foam was prepared using 6 ml of STD.

Now the varicose veins were drawn and site for injection were marked on the skin. The skin was prepared. Under ultrasound guidance needle was placed in the lumen of the vein, the vein was milked to empty it and then injection of foam was made. The bubbles

were verified inside the vein and simultaneously massaging with ultrasound probe to check that the foam fills all the desired veins. While injecting in the proximal part of LSV the upper end of saphenous vein was compressed with the ultrasound probe to prevent foam from entering into the deep veins. The needle was removed and a ball of cotton was placed securing it with an adhesive tape. Similar injections were made at all the desired sites, working from proximal to distal direction. All 30 ml of the foam can be injected depending on the extent of the disease. Now a crepe bandage is applied followed by Grade 2 compression stocking to be maintained for at least 6 weeks. The patient was allowed to walk in the waiting room and to rest there for half an hour.

### **OBSERVATIONS AND RESULTS**

The study comprised of 60 patients. There were 42 males (70%) and 18 females (30%) with an age range of 19 to 43 years (mean age 24 years). Majority of the patients belonged to CEAP grade C2 (51.7%), followed by C3 (23.3%); C4 (6.7%); C5 (10%) and C6

(8.3%) consecutively. The studied anatomical pattern of venous reflux was both superficial and deep in 75% while 25% of the patients shown superficial reflux only.

The affected segments of the venous system which were injected were: great saphenous vein in 11 patients (18.3%), short saphenous vein in 8 patients (13.3%), great saphenous vein and varices in 32 patients (53.3%) and short saphenous vein and varices in 9 patients (15%). Majority of the patients (45 patient, 75%) needed single session of sclerotherapy. 11 patients (18.3%) needed two sessions while 4 patients (6.7%) required three sessions of sclerotherapy.

Discolouration of skin was found to be the most common minor complication (in 23.3% of patients) followed by pain at the site of injection and blistering (both in 15%), superficial thrombophlebitis in 13.3% and headache in 8.3% of the patients.

All the patients had been followed at least for 6 months. At 6 months on colour Doppler study 76.6% of the patients shown complete occlusion and 18.3% partial occlusion. All the patients shown improvement in CEAP score.

**Table 1: Table showing complications following foam sclerotherapy**

	Complications	No. of patients (%)
1	Discolouration of skin/pigmentation	14 (23.3%)
2	Superficial thrombophlebitis	8(13.3%)
3	Allergic reaction	4(6.7%)
4	Pain at the site	9(15%)
5	Skin blistering	9(15%)
6	Visual disturbances	Nil
7	Headache	5(8.3%)
8	Stroke	Nil
9	Deep vein thrombosis	Nil

**DISCUSSION**

Sclerotherapy and its subsequent refinement of US guided foam sclerotherapy is now an established method for obliterating the varices. It can be taken as an outpatient procedure and is associated with minor side effects and complications and with rapid return to daily activities. The recurrences, which may be difficult to operate, can be treated simply and safely usually by a single injection of foam.

In the present study of 60 patients majority of the patients belonged to CEAP grade C2 (51.7%), followed by C3 (23.3%); C4 (6.7%); C5 (10%) and C6 (8.3%) consecutively. The anatomical pattern of venous reflux was both superficial and deep in 75% while 25% of the patients shown superficial reflux only. Most cases (75%) required single session of sclerotherapy. In the study of Gamal *et al.* [5] CEAP clinical stages were 48 patients with 60% in C2, 8 with 10% in C3, 17 with 21.25% in C4, 2 with 2.5% in C5 and 5 with 6.25% in C6 and the anatomical pattern of venous reflux were superficial and deep was 70% and 30% with superficial cases only. Darvall *et al.* [1]. observed out of 91 patients, C 59% belonged to C2, followed by C3 in 4.5%, C4 in 23%, C5 in 9% and C6 in 4.5%. Superficial and deep reflux was observed in 94.5% and superficial only at 5.5%.

Gamal *et al.* [5] also found foam sclerotherapy to be effective treatment both for main trunk and minor vein disease. In the present study majority of the patients (45 patient, 75%) needed single session of sclerotherapy. 11 patients (18.3%) needed two sessions while 4 patients (6.7%) required three sessions of

sclerotherapy. Darke *et al.* reported need of single session for complete occlusion in 55.5% as opposed to two sessions in 27.8% of patients

Concerning safety, serious adverse events including arterial events, pulmonary embolism, deep vein thrombosis, cutaneous necrosis and ulceration were statistically nil. The commonest adverse events associated with foam sclerotherapy in our study were skin discoloration in 23.3% of Patients, Pain at the site and blistering both in 15% and Superficial thrombophlebitis in 13.3% of patients. Thomasset *et al.* [3] observed superficial thrombophlebitis in 18%, pain in 14%, skin staining in 28%, deep vein thrombosis (DVT) in 1% of patients, allergic reaction in 1% and skin blistering in 1% of patients. A total of 48 patients experienced one, or more, of these complications. No patients experienced visual disturbance, a headache or other neurological symptoms. Myers *et al.* [4] observed deep vein thrombosis in 3.2% of patients. This is somewhat higher than reported in other studies.

In present study the follow up with colour Doppler ultrasound was done at 6 months 76.6% of the patients shown complete occlusion and 18.3% partial occlusion. 5.1% of the patients were lost to follow-up. Thomasset *et al.* [3] followed the patients for three months. He observed complete occlusion in 79% as opposed to partial occlusion in 14% of the patients. CEAP score declined in 97.6% of the patients. Darvall *et al.* [2] observed recanalization in 1.5% of the patients after initial complete occlusion at 6 months after the procedure.

## **CONCLUSION**

Colour Doppler Guided Foam Sclerotherapy is a recommendable modality of treatment of primary venous incompetence, isolated venous incompetence, recurrent and residual varices as well as patients with venous ulcers. It is an outpatient procedure and the patient can return to work early. It can be repeated safely with few minor complications. Single or sometimes two or three sessions leads to complete occlusion of superficial reflux in almost all the patients.

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