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RESEARCH ARTICLE

FOAM SCLEROTHERAPY FOR BELOW KNEE VARICOSE VEIN: SERIES OF 30 CASES

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ABSTRACT

Varicose vein is quite common disease seen in 10% of general population. It presents as dilated, tortuous veins or telangiectasias with reticular varicosities. Various risk factors in development of varicose veins include female sex, obesity, inactivity and family history. Our study was conducted on 30 patients with below knee varicose veins satisfying the inclusion and exclusion criteria, chosen from the in-patients of Surgery Department, J.S.S. Hospital, Mysore. Foam sclerotherapy was performed in below knee GSV with 3% polidocanol using TESSARI method. Patients were scored pre and post operatively with CEAP and duplex scan. Data was compared for CEAP grading, complications, pain scaling, cosmetic improvement, pre-operative and post operative duplex scan. Patients showed good cosmetic results with foam sclerotherapy as a significantly effective method for treatment of varicose veins. Side effects like haematoma, DVT and wound infection were not seen in our study.

INTRODUCTION

Varicose vein is quite common disease seen in 10% of general population.[1] It presents as dilated, tortuous veins or telangiectasias with reticular varicosities. Various risk factors in development of varicose veins include female sex, obesity, inactivity and family history.[2] They are classified into two types - primary and secondary. Primary varicose vein occurs due to intrinsic abnormalities of the venous wall, while secondary varicose veins are associated with superficial or deep venous insufficiency. Symptoms seen in most patient are heaviness, ache, pruritis, early fatigue of leg, oedema and in severe cases thrombophlebitis, hyperpigmentation, lipodermatosclerosis, ulceration, bleeding and equinus deformity.

Foam Sclerotherapy

Foam sclerotherapy is the advanced technique in sclerotherapy and recently has become established for treatment of larger varicose veins.[3,4] Especially for below knee varicose veins foam sclerotherapy is used to avoid damage to long Saphenous nerve.[4,5] Detergent type sclerosant can be easily transformed into foam by special techniques.

MATERIALS AND METHODS

Source and Size of Data: Data is collected from 30 patients of varicose veins satisfying the inclusion and exclusion criteria, chosen from the in-patients of Surgery Department, J.S.S. Hospital, Mysore during the study period of JUNE 2013 to JUNE 2014.

Inclusion Criteria: Diagnosed cases of long saphenous varicosity with or without perforator incompetence undergoing the procedure.

Exclusion Criteria: Venous ulcer, Secondary varicose veins due to deep vein thrombosis, AV malformation, Arterio-venous fistula, Pelvic tumors, Recurrent varicose veins, Isolated short saphenous varicosity, Allergy to sclerosant and Pregnancy

Pre-Operative Evaluation

1. Detailed history and examination of patient as mentioned in proforma
2. Investigations: routine and special both investigations are done

Routine Investigations like-Hemoglobin percentage, Bleeding and clotting time, Blood sugar, Blood urea, Serum creatinine, Chest X-ray, ECG

3. Special investigations -Doppler/ Duplex scanning of venous system
4. Consent for procedure
5. Pre-operative scoring
6. Prophylactic Antibiotic Inj. Ceftriaxone 1g I.V. stat given on table

Treatment Protocol And Methodology

Basic Facility: Operation theatre, **Sclerosant Used**: Polidocanal 3%, **Equipment**: Three way cannula, syringe 10 ml, infant feeding tube (size 5/6) and other operative instruments.

Above Knee Varicose Veins – All patients underwent Trendelenburg procedure with stripping of GSV up to knee.

Foam generation: The Tessari method is used for foam generation. Air is accepted as gas component for foam generation. The ratio taken for liquid sclerosant to air for foam

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generation is 1:4 (1 part of sclerosant + 4 part of air). Maximum amount of foam sclerosant to 1 leg is 10ml.

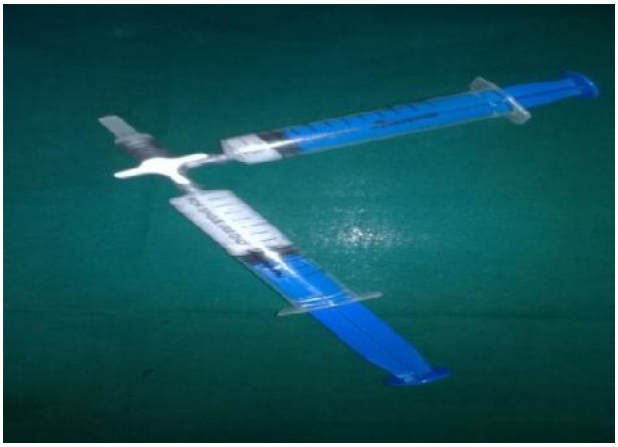
METHOD

Great Saphenous vein is exposed. The below knee GSV is canulated with infant feeding tube size 5/6 up to medial malleolus. Foam is generated by using Tessari method. Slowly foam is injected through infant feeding tube with gradual withdrawal. Proximal end after injecting foam is ligated. Not to move the leg for 5 minutes to prevent migration of foam to deep veins.Closure of the skin with nylon (3-0) and dressing was done.

Post procedure

NSAID is not used for 6 weeks and crape bandage application for 6 weeks.

Sclerosant-Polidocanal



Foam Generation-Tesseri Method

Intra-Operative (Foam Injection)

Pre Operative

Post Operative

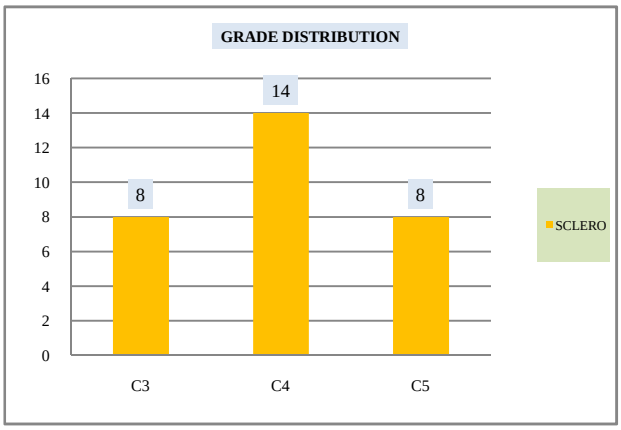
Pre and post operative scoring assessment

Score	Clinical criteria	Duplex criteria
0	No visible varicose veins/ Normal veins	Complete disappearance of treated veins/ complete occlusion/ fibrous cord
1	Decreased visible varicose vein/ improved CEAP grading	Partial occlusion of varicose veins/ remnant veins
2	No change in varicose veins/ Worsen varicose veins/ Same CEAP grading	Complete patency of vein or perforator/ recurrence

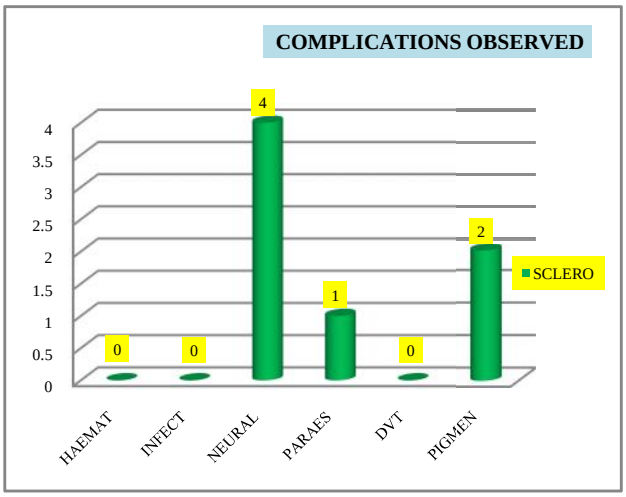
Maximum Score = 4 and Minimum Score = 0. Preoperatively, all patients will have score of 4 (because all patients had clinically significant varicose veins and patent incompetent perforators according to pre op duplex scan). Postoperatively, assessment was done on the basis of above parameter. We have taken clinical and duplex criteria both for better scoring and to minimise the bias.

Statistical Analysis And Data Obtained

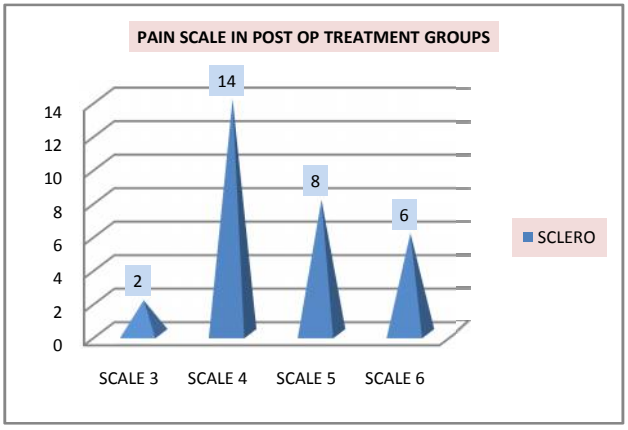
1. Clinical grade of varicose veins were calculated in each patient according to the CEAP classification. Out of total 30 patients who underwent surgical intervention grade C3 was present in 8 patients , C4 in 14 and C5 in 8 patients



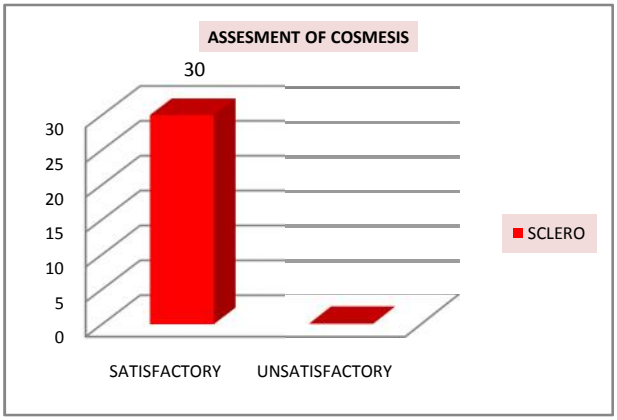
2. In our study post op complications like haematoma(haemat), infection(infect), neuralgia(neural), paraesthesia(paraes) and pigmentation occurred in few patients. No patient reported DVT as a complication while neuralgia was commonest followed by pigmentation.



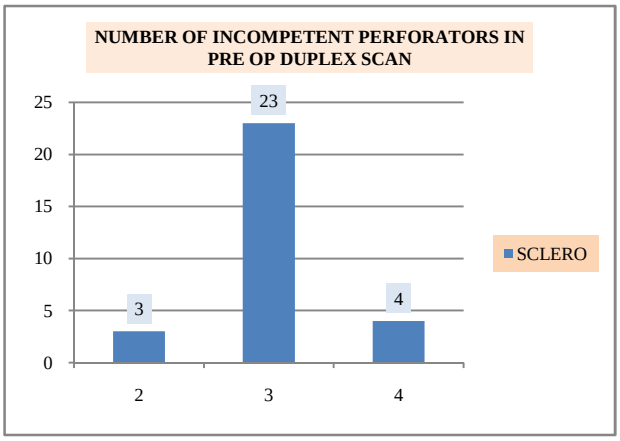
3. In our study, pain was calculated using visual analogue pain scale. Pain was graded in levels of pain scale like 3,4,5 and 6. Most of the patients belonged to scale 4(14 patients) and 5(8 patients)and 6 (6 patients) while pain scale 3(2 patients) was least common.



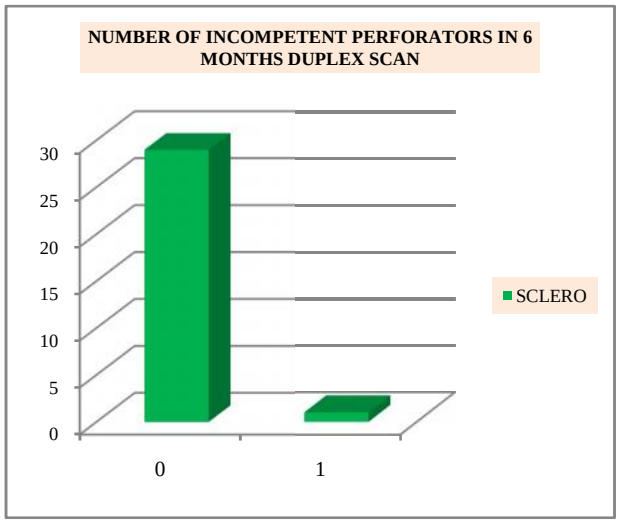
4. Assessment of cosmetic improvement whether satisfactory or unsatisfactory was performed. All 30patients showed satisfactory improvements while none were unsatisfactory.



5. Number of perforators incompetence in pre op duplex scan was recorded for every patient. Out of 30 patients on pre op duplex scan, 3 patients had 2 incompetent perforators. 23 patients had 3 while 4 patients had 4 incompetent perforators.



6. Out of 30 patients on post op duplex scan 1 patient had 1 incompetent perforator. Other 29 patients had no perforator incompetence in post op duplex scan.



RESULTS

The probability value or p- value was calculated for comparison of difference between score 1(pre operative) and score 2(6 months post operative) for sclerotherapy patients statistically**.** Probability value calculated by test above was =

0.000. If p-value calculated is <0.05 then hypotheses is proven to be true. So, this proves significant reduction in varicose veins with treatment of foam sclerotherapy.

DISCUSSION

Foam Generation

According to TESSSARI technique foam generated at low concentrations is fine bubbled and fluid while at high concentrations is viscous in nature. Air is proposed and mostly accepted as gas component for generating foam sclerosants for all indications. A mixture of oxygen and carbon dioxide is also used. The most preferred ratio for generating foam sclerosant is 1:4 (1 part liquid + 4 parts gas)[6.] Various ratios in between (1:1) and (1:5) for foam sclerosant have been used for reticular varicose veins and spider veins. The maximum recommended foam volume per leg per session (given in a single injection or in several injections) is 10 ml.

Complications

Complications and adverse events following sclerotherapy can be grouped as neuro-sensorial deficits (visual disturbances, headache, migraine, transient ischaemic attack and stroke), thrombotic complications (DVT, superficial thrombophlebitis, PE), general complications (allergy, anaphylaxis, infection, chest tightness), and local complications (hyper pigmentation, intra-arterial / extra venous injection, skin ulceration, necrosis and nerve injury). These complications occur with variable frequency depending on a number of factors including technical skills, type, nature, concentration, and volume of sclerosant used; Over all however, they are estimated to occur at a rate of 0.22% per session with liquid, and 0.58% per session with foam.

Varicose veins were divided into various grades according to clinical grading of CEAP classification. Out of the total 6 grades from C1- C6 , commonest was grade C4 seen in 46.66% of patients followed by grade C3 having 26.66%. Less number of cases were seen in grade C5 showing less willingness for treatment in healed ulcer type of disease. No cases were seen of grade C2 or C1 showing unwillingness for treatment in very mild form of disease (Reference Table 1)
Some post-operative complications were reported in few patients during the study period. In our study conducted on total 30 patients post op complications like haematoma, wound infection and DVT was nil. Post op complication of neuralgia occurred in total 4 patients. 87.67% of total study population were free from post op complication of neuralgia. No female developed neuralgia as complication Paraesthesia was observed in one patient after treatment. Pigmentation was observed in only 2 patients. Rest 93.34% of patients were free from pigmentation as complication (Reference Table 2)

Varicose veins sometimes do not have any symptoms. Mild calf pain is generally the common symptom encountered. But pain after post op procedure is a common complaint. In our study pain was graded in various levels using visual analogue pain scale. Out of the total 30 patients, 8 patients had pain scale 5 while 14 patients had pain scale 4. Only 2 patients of total were in pain scale 3 (Reference Table 3). Treatment of varicose veins also gives additional benefit of improved cosmetic appearance. Improvement in cosmetic appearance has become one of the important reasons for increased demand of treatment by the patient. All patients with sclerotherapy had satisfactory cosmetic improvement (Reference Table 4)

Number of perforator incompetence in pre op duplex scan was recorded for every patient. Out of 30 patients on pre op duplex scan 3 patients(10%) had 2 incompetent perforators. 23 patients(76.67%) had 3 perforator incompetence in pre op duplex scan and 4 patients(13.34%) had 4 incompetent perforators(Reference Table 5) .Number of perforator incompetence in post op duplex scan was recorded for every patient. On post op duplex scan only 1 patient had 1 incompetent perforator. So, only 3.34% of total study population had 1 incompetent perforator in post op duplex scan. Rest 96.66% patients had no perforator incompetence (Reference Table 6)

CONCLUSION

Patients in whom foam sclerotherapy was performed with 3% polidocanol showed good results and significantly effective method for treatment of varicose veins. Side effects like haematoma, DVT and wound infection were not seen in sclerotherapy.Pigmentation, neuralgia and paraesthesia as complications were significantly less. Post-operative duration of stay in hospital was less than 4 days in all patients. Over all cosmetic appearance of the limb was found to be significantly good with foam sclerotherapy. Mean reduction rate of varicosity by foam sclerotherapy was calculated to be 69.10%

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