

Original Research Article

EFFECT OF STAB AVULSION, SCLEROTHERAPY, SUBFASCIAL LIGATION ON BELOW KNEE PERFORATOR INCOMPETENCE

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ABSTRACT

Background: A disorder known as varicose veins is characterized by elongated, dilated and convoluted veins in the legs. Blood flow via this damaged valve reverses, which is its defining feature. Pregnancy, extended standing, female sex and a history of phlebitis are risk factors for varicose veins. The Trendelenberg procedure, vein stripping, stab avulsion, subfascial endoscopic perforator surgery, sclerotherapy and minimally invasive techniques including radiofrequency ablation and endovenous laser therapy are among the several treatment options for varicose veins. **Objectives:** To derive conclusions about efficacy of treatment in Perforator incompetence between stab avulsion, foam sclerotherapy and subfascial ligation.

Material and Methods: This study is single centre prospective single blinded randomized control trial on patients with varicose veins up to CEAP classification 2 in Kanyakumari Government Medical College Hospital, Asaripallam for 3 months.

Results: The study which was conducted among 45 patients with majority of male patients. Foam sclerotherapy is associated with lesser incidence of wound infection, hematoma formation, post-operative pain, scar /pigmentation and less recurrence rates than subfascial ligation and stab avulsion group.

Conclusion: Foam sclerotherapy is associated with lesser incidence of wound infection, hematoma formation, post-operative pain, scar /pigmentation and less recurrence rates.

Keywords: Stab avulsion, sclerotherapy, subfascial ligation, varicose veins.

INTRODUCTION

The Trendelenberg surgery with stripping of veins, stab avulsion, sclerotherapy and less invasive techniques including radiofrequency ablation and endovenous laser therapy are among the available treatment options for varicose veins. Depending on their cause, varicose veins can be categorised as primary or secondary. Primary varicose veins are caused by elasticity abnormalities and valvular incompetence resulting from developmental or genetic flaws in the vein wall. Primary varicose veins are the most frequent cause of isolated superficial venous insufficiency. The aetiology of secondary varicose veins can include trauma, deep

vein thrombosis (DVT), an arteriovenous fistula, or nontraumatic proximal venous occlusion such as a pelvic tumour or pregnancy. When the deep and perforating veins valves are damaged, chronic venous stasis develops.^[1]

Of all the illnesses that require surgical treatment, varicose veins account for 54,000 hospital in-patient episodes annually. Most vascular surgeons believe that if primary varicose veins are symptomatic, treatment is warranted. Varicose veins are commonly associated with symptoms such as poor cosmesis, pain and itching. Less common problems include haemorrhage (bleeding) and thrombophlebitis (inflammation of the vein wall with associated blood clot).^[2]

Complications and symptoms that restrict one's lifestyle are linked to varicose veins. Patients who do not respond to compression therapy may benefit from more intrusive procedures.^[3] Varicose veins can cause a variety of symptoms, the most common of which is soreness or heaviness that gets worse during the day. Itching and swelling in the ankles are other symptoms.^[4]

Foam sclerosants used in sclerotherapy have been documented in the literature for a long time. Foam sclerotherapy has been used with improved procedures since it was legally licenced in 2009, particularly for the treatment of small diameter veins. Following a successful course of sclerotherapy, the varicose vein eventually becomes a fibrous band of connective tissue, a phenomenon called sclerosis.^[5] More recently, outpatient treatment for varicose veins has been made possible by percutaneous interventional therapies such as chemical sclerotherapy employing foam.^[6]

The lower leg's perforator veins are cut and clamped in subfascial ligation to stop blood flow. It aims to cure chronic venous insufficiency, which is the primary cause of venous leg ulcers. As a result, it might be a successful treatment.^[7]

Nowadays, varicotomy and stab avulsion are thought to be the standard treatments for saphenous vein insufficiency. The question of whether incompetent perforator veins (IPVs) need to be treated is still up for debate.^[8]

MATERIAL AND METHODS

This study is a single centre prospective single blinded randomized control trial on a total of 45 patients (15 patients in each group) with varicose veins up to CEAP classification 2 who were

admitted to the general surgery wards of Kanyakumari Government Medical College Hospital in a period of 8 months.

There are three groups, Group A (stab avulsion), B(foam sclerotherapy)and C(subfascial ligation). Patients were allocated in each group based on closed envelope method. Consent for all the three procedure was obtained from the patients.

Statistical Analysis:

Analysis of variance (AVOVA) is used to compare three groups and compute f-value and p-value.

$$F (\text{Observed}) = \frac{\text{variance between groups}}{\text{variance within groups}}$$

Inclusion Criteria

1. Patients more than 25 years of age groups in both sexes presenting with varicose veins.
2. Patient with uncomplicated perforator incompetence.
3. Patients with CEAP classification up to 2.
4. Patients with small varicosities like thread veins and telangiectasia.
5. Patients with recurrent varicosities.

Exclusion Criteria

1. Patients less than 25 years of age.
2. Patient not consented for the study.
3. Patient with deep vein thrombosis.
4. Patient with active ulcer and lipodermatosclerosis.
5. Allergy to sclerosing agents.
6. Patients with peripheral arterial diseases

Parameters studied

The Parameters of the study includes age, sex, postoperative pain, hematoma formation, infection, scar/pigmentation, duration of hospital stay and recurrence.

CEAP classification

Clinical classification (C)	
C ₀	No visible sign of venous disease
C ₁	Telangiectases or reticular veins
C ₂	Varicose veins
C ₃	Edema
C ₄	Changes in skin and subcutaneous tissue (A) Pigmentation or eczema (B) Lipodermatosclerosis or atrophie blanche
C ₅	Healed ulcer
C ₆	Active ulcer
Etiologic classification (E)	
E _c	Congenital (e.g., Klippel-Trenaunay syndrome)
E _p	Primary
E _s	Secondary (e.g., postthrombotic syndrome, trauma)
E _n	No venous cause identified
Anatomic classification (A)	
A _s	Superficial
A _d	Deep
A _p	Perforator
A _n	No venous location identified
Pathophysiologic classification (P)	
P _r	Reflux
P _o	Obstruction, thrombosis
P _{rl}	Reflux and obstruction
P _n	No venous pathophysiology identified

RESULTS

Sex Distribution

In the Stab avulsion group among 15 patients, 10 (66.6%) were male, 5 (33.3%) were female. In foam sclerotherapy group among 15 patients, 8 (53.3%) were male patients and 7 (46.6%) were females. In Subfascial ligation group among 15 patients, 12 (80%) were men and 3 (20%) were women. There was no statistical significance among sex in all the three groups.

Age Distribution

The mean age in the study were 46,45,48 in stab avulsion, foam sclerotherapy and Subfascial ligation respectively. There was no statistical significance in age distribution among three groups.

Postoperative Pain

Visual Analogue Scale (VAS) is used to compare pain severity between groups. In Stab Avulsion, 2 patients (13.3%) were between 0 and 3 pain scores, 10 patients (66.6%) were between 4 and 6 pain score and 3 patients (20%) were between 7 and 9.

In Foam Sclerotherapy, 10 patients (66.6%) were between 0 and 3, 5 patients (33.3%) were between 4 and 6 and no patients (0%) between 7 and 9.

In Subfascial Ligation, 8 patients (53.3%) were between 0 and 3, 2 patients (13.3%) were between 4 and 6 and 4 patients (26.2%) were between 7 and 9. The f value is 49.28 and p-value is less than 0.00001. The result is significant.

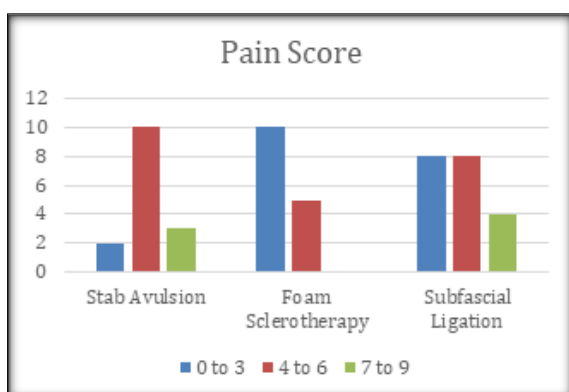


Figure 1: Postoperative pain score in stab avulsion, foam sclerotherapy, subfascial ligation

Hematoma formation

If there is any swelling at the location of the incision, it is described as a localised accumulation of blood at the surgical site. It was noted for a maximum of thirty days. Hematoma formation occurred in 4 patients (26.6%) in stab avulsion group, none (0%) in foam sclerotherapy group and 2 patients (13.3%) in Subfascial ligation.

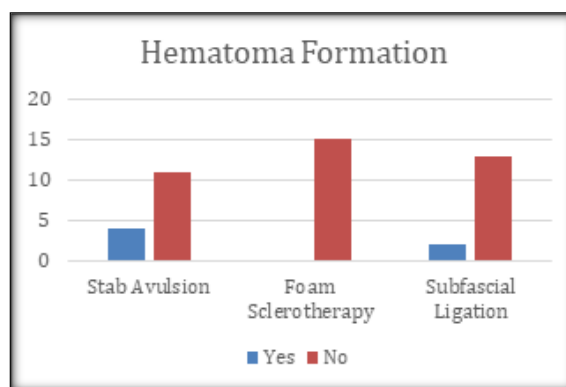


Figure 2: Hematoma formation in stab avulsion, foam sclerotherapy, subfascial ligation

Infection

Wound infection occurred in 3 patients (20%) in Stab avulsion, 1 patient (6.6%) in Foam sclerotherapy and 2 patients (13.3%) in Subfascial ligation.

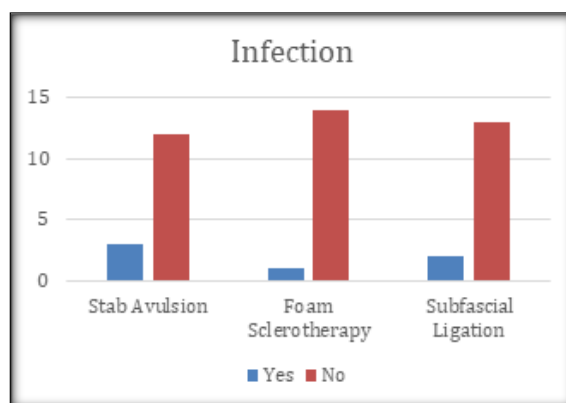


Figure 3: Wound infection in stab avulsion, foam sclerotherapy, subfascial ligation

Scar/Pigmentation

Scar / pigmentation occurred in 8 patients (53.3%) of stab avulsion, 4 patients (26.6%) in foam sclerotherapy and only 2 patients (13.3%) in subfascial ligation patients.

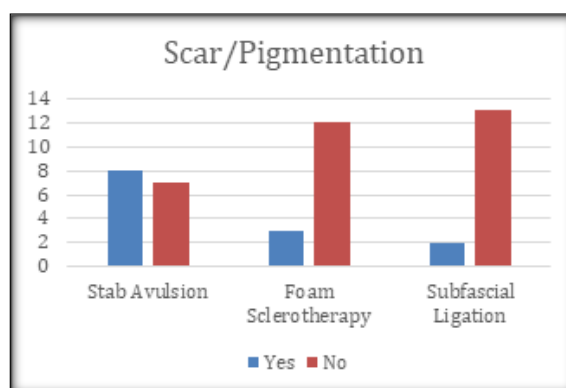


Figure-4: Scar in stab avulsion, foam sclerotherapy, subfascial ligation

Duration of hospital stay

In stab avulsion group, 3 patients (20%) were discharged within 1 week, in foam sclerotherapy group, 12 patients (80%) were discharged within 1 week and 10 patients (66.6%) were discharged within 1 week in subfascial ligation group. The f value is 12.71 and p value is 0.000118. The is statistically significant.

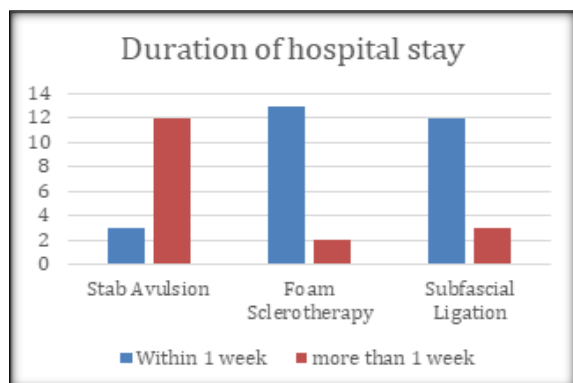


Figure-5: Duration of hospital stay in stab avulsion, foam sclerotherapy, subfascial ligation

Recurrence

In 3 months, 3 patients (20%) developed recurrence in stab avulsion group, 1 patient (6.6%) developed recurrence in foam sclerotherapy group and 2 patients (13.3%) developed recurrence in subfascial ligation group.

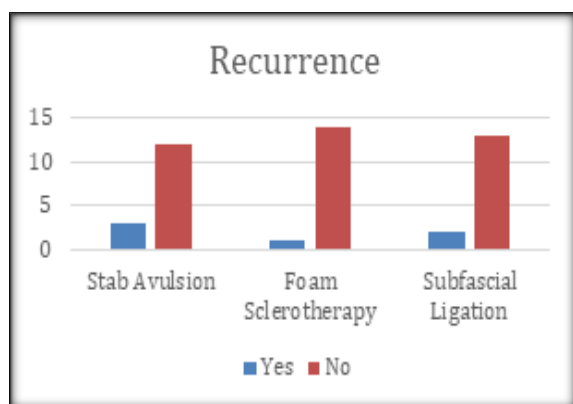


Figure 6: Recurrence in stab avulsion, foam sclerotherapy, subfascial ligation

DISCUSSION

The mean age group was similar in Stab avulsion, foam sclerotherapy and Subfascial ligation.

In the Stab avulsion group among 15 patients 10 (66.6%) were male, 5 (33.3%) were female. In foam sclerotherapy group among 15 patients 8 (53.3%) were male patients and 7 (46.6%) were females. In Subfascial ligation group among 15 patients 12 (80%) were men and 3 (20%) were women. This study predominantly consists male patients. But the age and sex distribution doesn't have statistical significance in the study. The study conducted by Arul Rajkumar M. and Neelakandan R. also says

that age and sex distribution does not have statistical significance.^[1]

There was significant difference in postoperative pain. Visual Analogue Scale is used to compare pain severity between groups. In Stab Avulsion, 2 patients (13.3%) score were between 0 and 3, 10 patients (66.6%) score were between 4 and 6, and 3 patients (20%) score were between 7 and 9. In Foam Sclerotherapy, 10 patients (66.6%) were between 0 and 3, 5 patients (33.3%) were between 4 and 6 and no patients (0%) between 7 and 9. In Subfascial Ligation, 8 patients (53.3%) were between 0 and 3, 8 patients (53.3%) were between 4 and 6 and 4 patients (26.2%) were between 7 and 9. so, it indicates that foam sclerotherapy is significantly better than stab avulsion. This result is similar to the study conducted by Arul Rajkumar M. and Neelakandan R,^[1] and Kumar S, Goswami P, Mukherjee P. Taking up subfascial endoscopic perforator surgery for patients of lower limb varicose veins with below knee perforators, in a government medical college-a review of eleven cases.^[9]

Foam sclerotherapy was associated with a statistically significant less incidence of Haematoma formation, wound infection than stab avulsion group and subfascial ligation group. This is because foam sclerotherapy is less invasive than the stab avulsion. The result is similar to study conducted by Arul Rajkumar M. and Neelakandan R.^[1]

The scar or pigmentation occurred in 53.3% of patients in stab avulsion, 26.6% of foam sclerotherapy patients and only 13.3% of subfascial ligation patients. The subfascial ligation is associated with much less scarring and a faster recovery than the open method. The result is similar to Kumar S, Goswami P, Mukherjee P. Taking up subfascial endoscopic perforator surgery for patients of lower limb varicose veins with below knee perforators, in a government medical college-a review of eleven cases.^[9]

Most of the people were discharged within one week from the hospital in foam sclerotherapy than stab avulsion group and subfascial ligation group. This is because foam sclerotherapy is less invasive than the stab avulsion. Foam sclerotherapy was associated with an earlier return to normal activities than stab avulsion. This may be due to the foam sclerotherapy is the simple procedure.^[1] Also, the mean hospital stay is less for subfascial ligation.^[9]

The stab avulsion has higher recurrence with 3 patients and the recurrence is lesser in foam sclerotherapy and subfascial ligation with 2 and 1 patients respectively. This might be because, foam sclerotherapy is technically easier to do with shorter learning curve. The study conducted by Arul Rajkumar M. and Neelakandan R. also stated the same.^[1]

Although insufficient or incompetent perforator veins are the most prevalent cause of recurrent varicose veins following treatment, they are frequently overlooked. Varicose veins and lower

extremity superficial venous reflux are most frequently caused by incompetent superficial veins. Intervention is frequently necessary for perforator vein insufficiency, which can cause discomfort, skin abnormalities, and ulceration. Minimally invasive treatments have replaced traditional surgical treatments for incompetent perforator veins.^[10]

CONCLUSION

Foam sclerotherapy is associated with lesser incidence of wound infection, hematoma formation, post-operative pain and less recurrence rates. Foam sclerotherapy is a simple procedure, and it is cosmetically better for young females.

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Conflict of Interest: Nil

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