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# Day Case Management of Varicose Veins

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Additional information is available at the end of the chapter

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## 1. Introduction

Lower limb varicose veins are a common disease that affects almost a quarter of the adult population. They are one of the commonest conditions requiring intervention. They affect women more frequently than men, and are reported in 20-60% of the general population. Approximately one million people in the United Kingdom are affected with VV. Nearly half a million seek advice from their primary care practitioner about VV in the lower limbs and their related symptoms every year. Of those, 75,000 patients receive some form of intervention. It is estimated that surgical treatment of varicose veins are responsible for 54000 hospital episodes per year in England. They constitute a large part of elective surgical waiting lists [1, 2 and 3].

The treatment of primary varicose veins is considered appropriate by the majority of vascular surgeons if the veins are symptomatic. Common symptoms include poor cosmesis, aching and itching. Less common problems are haemorrhage, thrombophlebitis, ankle pigmentation, lipodermosclerosis and ulceration. The extent of visible veins does not correlate with the severity of the symptoms experienced by patients [4].

Treatment options available for varicose veins traditionally included either conservative management with lifestyle advice and compression hosiery or surgery. Surgery involves saphenofemoral junction disconnection and stripping of the long saphenous vein and multiple stab avulsions for varicose veins stemming from saphenofemoral reflux; saphenopopliteal disconnection for saphenopopliteal reflux [2].

Results from traditional surgery are excellent and have stood the test of time. However, there has been an expansion of less invasive treatment modalities for VV, such as radiofrequency ablation, endovenous laser treatment, sclerotherapy (liquid and foam), transilluminated powered phlebectomy, and subfascial endoscopic perforator vein surgery. These minimally invasive therapies are attractive to both patients and healthcare professionals but there is paucity of good quality data from randomized control trials [5].

Moreover, the need for specialized equipment and additional training to become proficient at new techniques, prevent surgeons from practicing these procedures.

In the United Kingdom, until there is long-term follow-up with the less invasive procedures, the gold standard for VV surgery is still a standard saphenofemoral junction ligation and disconnection (SFJLD) with stripping of the long saphenous vein and multiple stab avulsions. As stripping of the long saphenous vein is painful, this surgery requires a general anaesthetic and an overnight in-patient stay for satisfactory recovery.

We propose a new approach to addressing problems with VV in the lower limb that obviates the need for a general anaesthesia. After SFJLD, the varicosities in the long saphenous system are rarely fed retrogradely unless there are incompetent perforators—thus, varicosities in the lower limb would be expected to diminish in size and length. If the long saphenous vein is left in situ without stripping and stab avulsions are not done at the time of groin exploration for SFJLD, VV surgery can be done safely under local anaesthetic. Currently, we perform multiple stab avulsions (under local anaesthetic) as a second-stage procedure at 6 months post-SFJLD.

The purpose of this study was twofold. The first aim was to study the longitudinal functional and cosmetic outcome in a consecutive series of patients who had SFJLD under local anaesthetic. Our second aim was to identify the optimum time gap from SFJLD to multiple stab avulsions for residual VV.

## 2. Methods

A prospective observational study was designed by the Scarborough General Hospital Vascular team. It was carried out between June 2006 and June 2008.

The patients were recruited in two different out patient clinics, including Scarborough General Hospital Outpatient department and Malton County Hospital Outpatient Department. Both clinics were supervised by a single Consultant Vascular Surgeon.

A very specific inclusion criteria was devised to select the patients to be included in this study:

1. Patients met the National Institute of Clinical Excellence guidelines for treatment of Varicose Veins.
2. Patients with clinical evidence of Primary varicose veins of the Long Saphenous Vein distribution.
3. All patients had clinical and ultrasonographic evidence of incompetence at the Saphenofemoral junction. This was demonstrated using, either a Hand Held Doppler Machine or a Venous Duplex Ultrasound Scan.
4. All patients were suitable for Local Anaesthetic Surgery in a day case setting
  - Patients had a BMI less than 35
  - Patients had transport arranged to go back home as they were not allowed to drive themselves

- Patients had a responsible carer to look after them postoperatively
- Patients were ASA (American Society of Anaesthesiologist Classification) I, II or III
- Patient/Carer must have access to a private telephone
- Patients residence must be within one and a half hour of a Hospital with Accident and Emergency and Vascular facilities

Exclusion criteria included

1. Pregnancy
2. Age below 18 years
3. Allergy to Local Anaesthetic Agents
4. Patients with Varicose veins of the Short Saphenous System distribution
5. Recurrent Varicose Veins
6. Patients with complex varicosities
7. Previous history of Deep Vein Thromboembolism
8. Areas of active ulceration (CEAP Classification C6)

## 2.1. Veins and questionnaire assessment

Suitable patients were seen preoperatively in the Outpatient Clinic. All the visible varicose veins were marked with a permanent ink pen. After that, the length of varicosities was measured using a cartographer's wheel (Figure 1)

The outer ring of the cartographer's ring measures the length of varicosities in centimetres and gives us an accurate measurement of the extension of the Varicose Veins. This measurement was done by a single assessor.

A higher measurement on the wheel cartograph meant a greater volume of varicose veins.

Every patient taking part in the trial was asked to fill up four standardized health questionnaires:

### 1. CEAP score

Mark	DEFINITION
C	Clinical signs (grade 0-6) supplemented by (s) for symptomatic and (a) for asymptomatic presentation
E	Ethiological Classification (Congenital, Primary, Secondary)
A	Anatomical Distribution (Superficial, Deep, Perforator)
P	Pathophysiology Dysfunction (Reflux, Obstruction)

**Table 1.** Classification of chronic lower extremity venous disease. CEAP score



Figure 1.

Class	Cinical signs
0	No visible or palpable signs of venous disease
1	Telangiectases, reticular veins, malleolar flare
2	Varicose Veins
3	Oedema without skin changes
4	Skin changes ascribed to venous disease (pigmentation, venous eczema, lipodermatosclerosis)
5	Skin changes in conjunction with healed ulceration
6	Skin changes in conjunction with active ulceration

Table 2. CEAP Clinical classification of chronic lower extremity venous disease

2. Venous clinical severity score

Attribute	Absent = 0	Mild = 1	Moderate = 2	Severe = 3
Pain	None	Occasional	Daily	Limit activities
Varicose veins	None	Few, scattered	Multiple (LSV)	Extensive (LSV, SSV)
Venous Oedema	None	Evening, Ankle	Afternoon, leg	Morning, leg
Pigmentation	None	Limited area	Wide (lower 1/3)	Wider (Above 1/3)
Inflammation	None	Cellulitis	Cellulitis	Cellulitis
Induration	None	Focal (<5 cm)	<lower 1/3	Entire lower 1/3
Number of AC	None	1	2	3
Duration of AC	None	<3 months	3 months- 1 year	>1 year
Size of AC	None	<2 cm diameter	2-6 cm diameter	>6 cm diameter
Comp therapy	Not used	Intermittent use	Most days	Continually

### 3. Aberdeen varicose vein severity score

1. Please draw in your varicose veins in the diagram below: Vein grid
2. In the last two weeks, for how many days did your varicose veins cause you pain or ache?
3. during the last two weeks, on how many days did you take painkilling tablets for your varicose veins?
4. In the last two weeks, how much ankle swelling have you had?
5. In the last two weeks, have you worn support stockings or tights?
6. In the last two weeks, have you had any itching in association with your varicose veins?
7. Do you have purple discolouration caused by tiny blood vessels in the skin, in association with your varicose veins?
8. Do you have a rash or eczema in the area of your ankle?
9. Do you have a skin ulcer associated with your varicose veins?
10. Does the appearance of your varicose veins cause you concern?
11. Does the appearance of your varicose veins influence your choice of clothing including tights?
12. During the last two weeks, have your varicose veins interfered with your work/housework or other daily activities?
13. During the last two weeks, have your varicose veins interfered with your leisure activities(including sport,hobbies and social life)?

### 4. SF36

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#### SF-36 Health survey

Instructions for completing the questionnaire: Please answer every question. Some questions may look like others, but each one is different. Please take the time to read and answer each question carefully by filling in the bubble that best represents your response.

Patient Name: \_\_\_\_\_

SSN#: \_\_\_\_\_ Date: \_\_\_\_\_

Person heling to complete this form: \_\_\_\_\_

1. In general, would you say your health is:

- q Excellent
- q Very good
- q Good
- q Fair
- q Poor

2. Compared to one year ago, how would you rate your health in general now?

- q Much better now than a year ago

- q Somewhat better now than a year ago
- q About the same as one year ago
- q Somewhat worse now than one year ago
- q Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

c. Lifting or carrying groceries.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

d. Climbing several flights of stairs.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

e. Climbing one flight of stairs.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

f. Bending, kneeling or stooping.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

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g. Walking more than one mile.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

h. Walking several blocks.

- q Yes, limited a lot.
- q Yes, limited a little.
- q No, not limited at all.

i. Walking one block.

q Yes, limited a lot.

q Yes, limited a little.

q No, not limited at all.

j. Bathing or dressing yourself.

q Yes, limited a lot.

q Yes, limited a little.

q No, not limited at all.

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

a. Cut down the amount of time you spent on work or other activities?

c Yes c No

b. Accomplished less than you would like?

c Yes c No

c. Were limited in the kind of work or other activities

c Yes c No

d. Had difficulty performing the work or other activities (for example, it took extra time)

c Yes c No

5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

a. Cut down the amount of time you spent on work or other activities?

c Yes c No

b. Accomplished less than you would like

c Yes c No

c. Didn't do work or other activities as carefully as usual

c Yes c No

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

q Not at all

q Slightly

q Moderately

q Quite a bit

q Extremely

7. How much bodily pain have you had during the past 4 weeks?

q Not at all

q Slightly

q Moderately

q Quite a bit

q Extremely

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8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

q Not at all

q Slightly

q Moderately

q Quite a bit

q Extremely

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks.

a. did you feel full of pep?

q All of the time

q Most of the time

q A good bit of the time

q Some of the time

q A little of the time

q None of the time

b. have you been a very nervous person?

q All of the time

q Most of the time

q A good bit of the time

q Some of the time

q A little of the time

q None of the time

c. have you felt so down in the dumps nothing could cheer you up?

q All of the time

q Most of the time

q A good bit of the time

q Some of the time

q A little of the time

q None of the time

d. have you felt calm and peaceful?

q All of the time

q Most of the time

q A good bit of the time

q Some of the time

q A little of the time

q None of the time



e. did you have a lot of energy?

- q All of the time
- q Most of the time
- q A good bit of the time
- q Some of the time
- q A little of the time
- q None of the time

f. have you felt downhearted and blue?

- q All of the time
- q Most of the time
- q A good bit of the time
- q Some of the time
- q A little of the time
- q None of the time

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g. did you feel worn out?

- q All of the time
- q Most of the time
- q A good bit of the time
- q Some of the time
- q A little of the time
- q None of the time

h. have you been a happy person?

- q All of the time
- q Most of the time
- q A good bit of the time
- q Some of the time
- q A little of the time
- q None of the time

i. did you feel tired?

- q All of the time
- q Most of the time
- q A good bit of the time
- q Some of the time
- q A little of the time
- q None of the time

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?

- q All of the time
- q Most of the time
- q Some of the time

- q A little of the time
- q None of the time

11. How TRUE or FALSE is each of the following statements for you?

a. I seem to get sick a little easier than other people

- q Definitely true
- q Mostly true
- q Don't know
- q Mostly false
- q Definitely false

b. I am as healthy as anybody I know

- q Definitely true
- q Mostly true
- q Don't know
- q Mostly false
- q Definitely false

c. I expect my health to get worse

- q Definitely true
- q Mostly true
- q Don't know
- q Mostly false
- q Definitely false

d. My health is excellent

- q Definitely true
- q Mostly true
- q Don't know
- q Mostly false
- q Definitely false

The clinical component from CEAP scores ranges from 0 to 6; Higher scores denote greater severity.

The VCSS consist of clinical variables, each ranging from 0(none) to 3 (severe). Thus, the VCSS ranged from 0 to 30; Higher scores denote greater severity of varicose veins.

The AVVSS assessment consisted of 13 clinical variables and the completion of a vein grid. Each question was given a weighted score. For each limb, the AVVSS produced a score ranging from 0 to 50; Higher scores meant greater severity of Varicose Veins.

The SF-36 is a multi-purpose, short-form health survey with only 36 questions. It yields an 8-scale profile of functional health and well-being scores as well as psychometrically-based physical and mental health summary measures and a preference-based health utility index. It is a generic measure, as opposed to one that targets a specific age, disease, or treatment group. Accordingly, the SF-36 has proven useful in surveys of general and specific

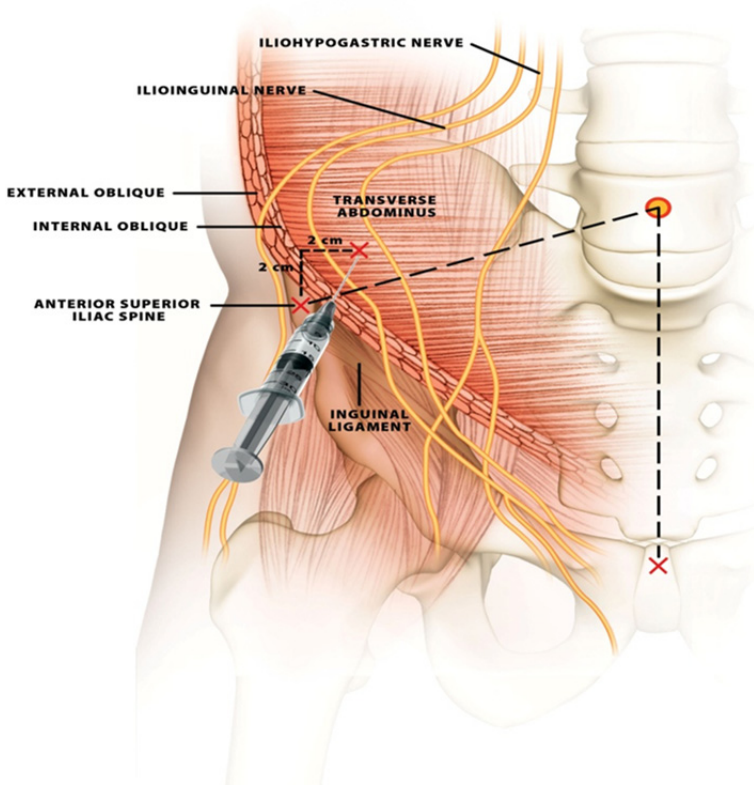
populations, comparing the relative burden of diseases, and in differentiating the health benefits produced by a wide range of different treatments.

### 3. Operative details

The procedure was carried out by, or supervised by, a single consultant.

Patients were prepared with non alcoholic povidone-iodine and draped with sterile disposable materials.

1% Lignocaine with Adrenaline was used to anaesthetize the groin and perform a Ilio-inguinal nerve block, according with the guidelines of Local Anaesthetic use [11] (Figure 2)



**Figure 2.**

The incision in the groin is placed medial to the Femoral pulse and 1 centimetre above the inguinal crease.

The dissection begins with the identification of the Long Saphenous Vein and the Sapheno-Femoral junction where the Long Saphenous Vein joins the Deep Femoral Vein. All

tributaries of the Long Saphenous Vein are tied with 3.0 Vicryl sutures (Ethicon Inc Somerville, NJ). Smaller tributaries are dealt with Bipolar Diathermy. The proximal end of the Long Saphenous Vein is suture-ligated with 1.0 Vicryl and disconnected 0.5 cm flush from the Deep Femoral Vein.

Fascial layers are closed with interrupted 2.0 Vicryl sutures and the skin approximated with 2.0 Monocryl sutures (Ethicon Inc., Somerville, NJ).

Patients go back to the Day Unit where they are observed for 2 hours after their procedure and discharged from the Unit provided there are not complications.

### 3.1. Follow up

All patients who had Sapheno-Femoral junction Ligation and Disconnection(SFJLD) under Local Anaesthetic were reviewed in the Outpatient Department at 1,3 and 6 months postoperatively. At each of these times, the veins were examined clinically, marked and measured with the cartographer's wheel and the four questionnaires were repeated.

After a final assessment post- SFJLD, patients are listed for Multiple Stab Avulsions under Local Anaesthetic.

A three month Outpatient Department appointment is given to every patient for further clinical assessment. In addition, all patients were contacted at the end of the study to assess the recurrence of Varicose Veins.

### 3.2. Statistics

The data collected were found to be parametric. The repeated measures analysis of variance test was used to compare continuous variables within the same groups of patients. Means and 95% confidence intervals were calculated for all variables. A  $p$  value of  $<0.05$  was deemed significant

### 3.3. Results

There were 48 patients (15 men; mean age: 54 years; 95% CI: 29-79). Mean follow-up period after surgery was 43 (95% CI: 38-48) months. In all, 30 (91%) patients had immediate cosmetic and symptomatic improvement after surgery.

On follow-up, the volume of VV reduced significantly over the three postoperative time points when compared with preoperatively (112 [95% CI: 88-136] vs. 75 [95% CI: 55-97] vs. 65 [95% CI: 43-87] vs. 58 [95% CI: 31-86],  $p = 0.001$ ) (Fig. 3).

Using the CEAP (Fig. 4), VCSS (Fig. 5), and AVVSS (Fig. 6) questionnaires, severity of VV improved postoperatively when compared with preoperatively ( $p = 0.001$  for all three). Likewise, using the SF-36 questionnaire, significant improvements in quality of life were noted postoperatively (Fig. 7) ( $p = 0.032$ ).

The results from the aforementioned analysis suggest that improvement in both the extent and severity of VV can occur to a maximum of 6 months after SFJLD under local anaesthetic. The second-stage procedure of multiple stab avulsions can therefore be performed to a maximum of 6 months after the index procedure without clinical deterioration.

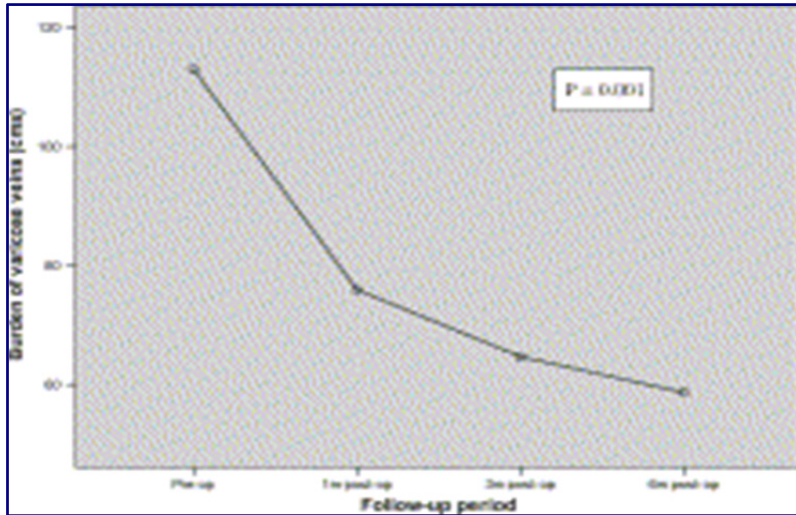


Figure 3. Follow-up of burden of varicose veins after surgery.

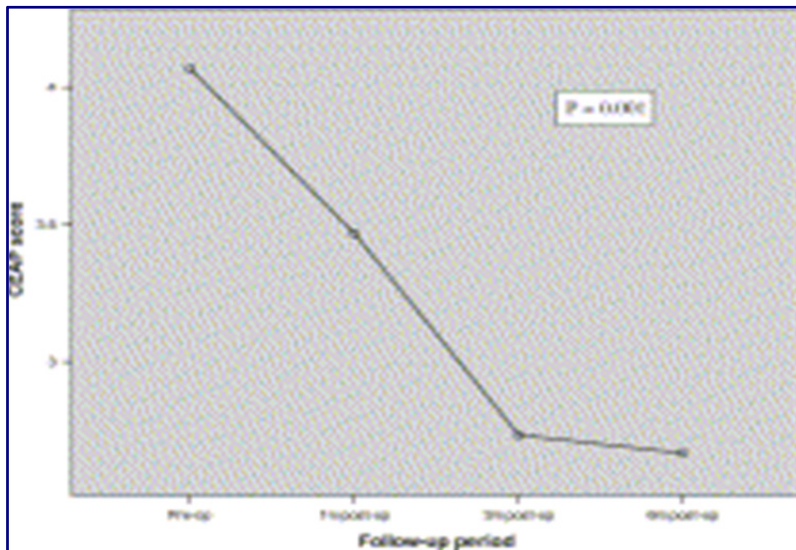


Figure 4. Follow-up of Clinical Etiology Anatomy Pathology scores after surgery.

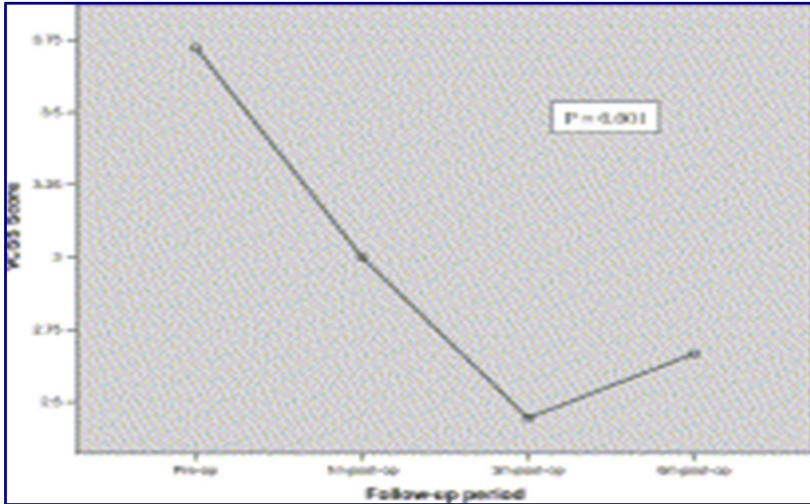


Figure 5. Follow-up of Venous Clinical Severity Scores after surgery.

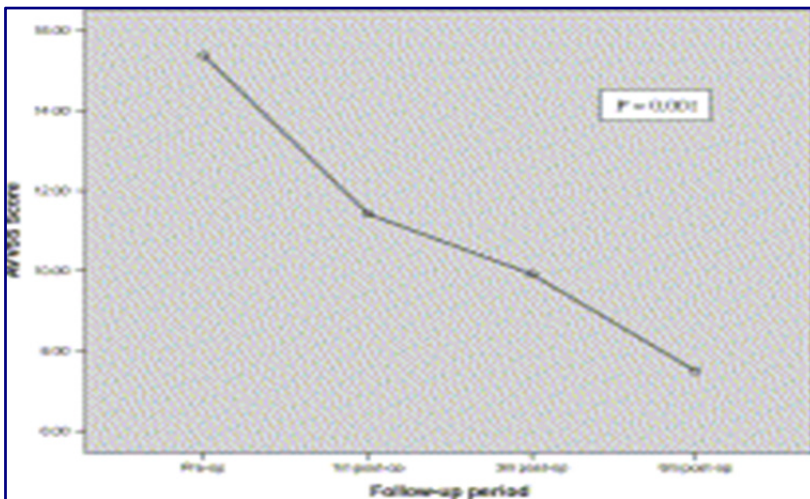
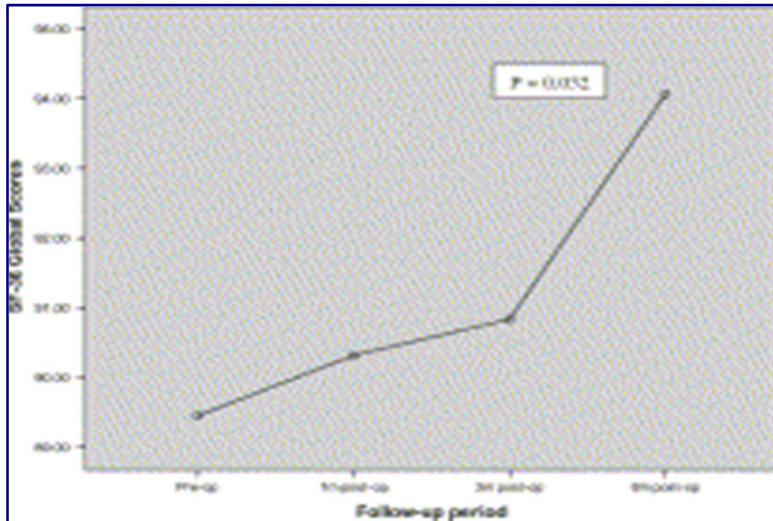


Figure 6. Follow-up of Aberdeen Varicose Vein Severity Scores after surgery.

On maximum follow-up, six (13%) patients had recurrent VV. Of these, two patients opted for redo surgery. This consisted of re-exploration of the groin and stripping of the long saphenous veins under a general anaesthetic.



**Figure 7.** Follow-up of Short Form 36 scores after surgery.

#### 4. Discussion

The results from present study suggest that SFJLD under local anaesthetic confers symptomatic and cosmetic improvement 1 month after the procedure. Improvements are sustained on early follow-up, thereby allowing multiple stab avulsions to be performed as a staged procedure within 6 months of the index procedure.

Currently, there is an increasing demand and need for VV surgery. Despite this demand, waiting lists are increasingly “controlled” and the funding is “regulated” by primary care trusts because VV are deemed to be a cosmetic disease without any life-threatening consequences. Ligation of the great saphenous vein at the SFJ, with or without stripping, is a long described method of VV surgery with varying successes [12, 13, 14]. We believe that SFJLD under a local anaesthetic, is a feasible procedure for VV disease, particularly for those with early disease. There are several advantages. Our method does not require a general anaesthetic and the procedure can be done as a day case without an in-patient stay. As such, surgery for VV can be done in peripheral cottage hospitals where specialized equipment and support from anaesthetic colleagues may be unavailable. The shift of work to peripheral hospitals reduces the demand and pressure on waiting list in larger central hospitals where general anaesthetic lists are being done.

The results obtained from the various VV questionnaires were reassuring. The procedure used in the present study resulted in significant cosmetic and functional improvement on

short-term follow-up. We saw significant improvements with all three VV-specific questionnaires (CEAP, VCSS, and AVVSS questionnaire). Although the AVVSS questionnaire was initially designed to assess severity of varicosities in both lower limbs, we were still able to use it for unilateral assessment. The assessment was performed unilaterally in our series of patients because the total volume of local anaesthetic that was used for the procedure was often the limiting factor in surgery. Results from the SF-36 questionnaire have to be interpreted with caution. We noted significant improvements in quality of life up to 6 months postoperatively. The SF-36 is a global quality of life questionnaire, which may not be sensitive enough to detect improvements in quality of life as a direct consequence of VV surgery. However, to date, we are unaware of a more specific quality of life questionnaire, which has been designed for patients who underwent VV surgery.

There were several limitations to our study. First, the size of our patient population was small. We have been selective in the recruitment of patients for this study. Patients in our study had simple VV with minimal chronic venous changes; thus, they were patients who had early VV. We did not perform Duplex studies in any patients preoperatively. Certainly, the rates of early recurrent VV in our study are higher than conventional studies and this may be secondary to our failure to perform Duplex studies. This would have identified the anatomy of the long saphenous veins and potential perforators associated with it.

To further validate the study it may have been useful to have pre- and postoperative formal Duplex studies for comparison and to help explain disease recurrence. The reported rate of clinical recurrence ranges from 20 to 80% after a period between 5 and 20 years [15]. The average time between the first and the second surgical treatments is long ranging, from 6 to 20 years [16, 17].

As long-term data are lacking in our series, our recurrence rate of 13% at maximum 3 years follow-up may underestimate total disease recurrence. At 2 years follow-up, a recurrence rate of 16% was demonstrated by clinical and Duplex evaluation in a study by Coufinhal [18]

The rate of disease recurrence increases with time, probably because of progression of the disease. Kostas et al identified three main causes of disease recurrence [19]. The first was attributable to inadequate initial treatment and results in recurrence in 55-70% of cases. It arises either as a result of failure in identifying all incompetent veins or a failure in carrying out adequate primary treatment. The second group of causes arises from disease progression resulting in development of varices in previously normal veins and accounting for 20-25% of recurrences. The third cause of recurrence is neovascularization, in which varices arise in the track of previously stripped or ligated veins and account for 5-25% of recurrences. Dissection of the tributary vessels at the SFJ may contribute to our early rates of recurrence. Taking vessels back beyond the primary, or even the secondary tributaries, may be a cause of neovascularization in the groin. Duplex ultrasound surveillance has supported this finding [20].



## 5. Conclusion

SFJLD under local anaesthetic is a suitable procedure with early VV. Patients who undergo this procedure show improvement in cosmesis and function. However, on short-term follow-up, it appears to be associated with higher rates of recurrent VV when compared with conventional techniques.

## Author details

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