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Original Research Article

Clinical Study of varicose veins and their management

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Abstract

Varicose veins and their associated symptoms and complications constitute the most common chronic vascular disorders leading to surgical treatment. Though considerable advances in understanding of venous patho physiology and modern imaging techniques have revolutionized the concept of management of varicosity of lower limb, whether these inferences hold good for our population is a pertinent question.

The objective of the study is: 1) Analysis of the clinical features of varicose vein. 2) To know the various treatment modalities adapted for the management of varicose veins.

Varicosity of the lower limb is a common clinical entity with, age group of 31-40 being commonly affected. The involvement of long saphenous vein is the commonest. Clinical examination has a high predictive accuracy. The use of color Doppler is a valuable supplement to clinical examination for effective treatment of varicose veins.

Operative line of treatment is a primary procedure in the management of varicose veins of lower limbs. LSV stripping up to mid calf is associated with less morbidity so also non-stripping of SSV. The present procedures enable the patient to lead almost normal life after surgery and the mortality rate is very negligible.

Keywords: Varicose vein, Doppler, Stripping.

1. Introduction

Varicose veins and their associated symptoms and complications constitute the most common chronic vascular disorders leading to surgical treatment. The term varicose is derived from the Latin word meaning dilated. The definition of varicose veins varies widely ranging from "clearly visible, dilated, tortuous and possibly prominent subcutaneous veins of lower extremities" according to Arnoldi, to "dilated veins secondary to loss of valvular efficiency" according to Dodd and Cockett, "Vein with a saccular dilatation which is often tortuous" according to WHO. This variation in the definition of varicose veins has lead to wide discrepancies in its incidence reported in the literature.

Though varicose veins were recognized pre historically only in the present century considerable knowledge has been gained concerning the anatomy of venous system of the leg, the physiological mechanism of venous return to heart against gravity and pathology of the disorder, which has lead to many newer modalities of treatment.

The term "varicosity" is generally applied to elongated, tortuous, pouched, thickened, inelastic and friable vessels which have permanently lost its valvular efficiency though similar changes may also occur in veins in the anal canal, as hemorrhoids, varicocele of pampaniform plexus, and in cases of portal hypertension at the lower end of oesophagus.

1.1 Epidemiology

Varicose veins are common. The prevalence has been variously reported from as little as 2% to over 20% in population studies [1]. This enormous variation results from the different populations studied, different definitions applied and the different assessment or examination techniques used. Western studies have shown that 20% population suffer from varicose vein and 2% have skin changes preceding to venous ulceration [1].

The Edinburgh Venous study (EVS) [2] published in 1998 examined over 1500 adults in UK, showed that 39.7% of men and 32.2% of women had a dilated tortuous trunk of the long and/or short saphenous vein and their first or second order branches. The prevalence of webs or small reticular

varicosities was even higher at over 80% for both males and females. Although it was previously believed that varicose veins are more common in women, few other population studies confirm that varicose veins are at least as common in men.

The prevalence of varicose veins rise with age in virtually all published studies; the prevalence of trunk varicosities in the EVS rose from 11.5% in the 18-24 year old group to 55.7% in those aged 55-64. Although there is considerable anecdotal evidence to suggest that varicose veins are less common in developing countries like ours, the absence of adequate epidemiological data leaves the question open.

The search for more effective means of prevention and cure for this common condition continues and this dissertation covers almost all aspects of varicose veins of lower limb.

1.2 Objectives

- Analysis of clinical features of varicose veins of lower limb.
- The various treatment modalities adapted for the management of varicose veins.

2. Methodology

This was a prospective study involving 50 patients who presented with symptoms of primary varicose veins to Victoria hospital, attached to Bangalore Medical College, Bangalore during January 2014 to June 2015.

2.1 Inclusion criteria

Patients presenting with signs and symptoms of primary varicose veins that get investigated with Doppler and undergoing any appropriate definitive surgical procedure.

2.2 Study design

All patients who presented to our outpatient department with symptoms of primary varicose veins were meticulously by examined and later subjected to Color Doppler studies before they underwent surgery for the same.

2.3 Clinical examination

After obtaining an adequate history, the patient was examined in standing position with good illumination, exposing both the lower limbs completely. The following tests were performed.

- Brodie trendelunburg I and II
- Modified Parthe's test
- Multiple tourniquet test
- Schwartz test
- Morrissey's cough impulse test.
- Fegan's test.
- Abdominal and rectal examination

The results of the tests were documented according to the clinical proforma.

2.4 Color Doppler ultrasonography

We used the Siemens ultrasonography machine.

Using a 10 MHz probe, the patient was examined in standing position along the whole length of the long saphenous and short saphenous systems.

The following signs were specifically looked for:

1) Saphenofemoral junction incompetence
2) Saphenopopliteal junction incompetence
3) Perforator incompetence
4) Deep venous system
5) Presence of abnormal or unnamed veins or perforators

The sites of incompetence were marked by indelible skin pencil.

2.5 Intraoperative findings:

The following operative procedure were undertaken –

- High, flush ligation of saphenofemoral junction with or without stripping of long saphenous vein.
- High, flush ligation of saphenopopliteal junction without stripping of short saphenous vein.
- Incompetent perforator vein ligation.

The intra-operative results were documented in the proforma.

2.6 Follow Up

All patients were discharged after 5 to 10 days with mean 7 days after surgery with elastic bandage.

They were all followed up for a minimum of 6 months after they were discharged for:

- Symptomatic relief
- Recurrence of varicosity
- Healing of varicose ulcers.

3. Results

50(Fifty) patients with primary varicose veins who were treated in Victoria Hospital attached to Bangalore Medical College (BMC), during January 2014 to June 2015 were included in the study.

3.1 Demographic Data

Figure 1: Age distribution

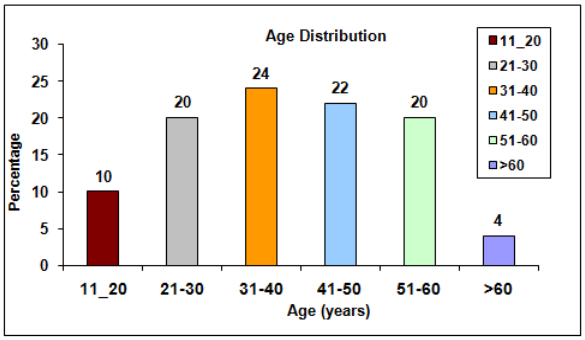


Figure 2: Sex distribution

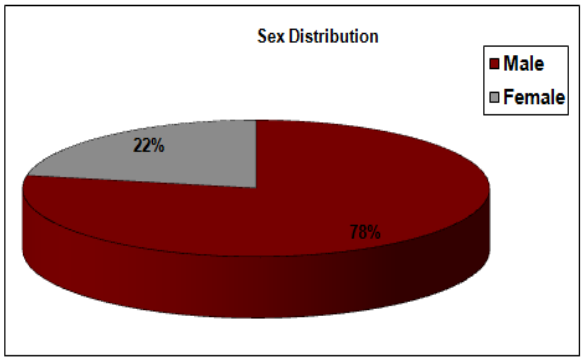
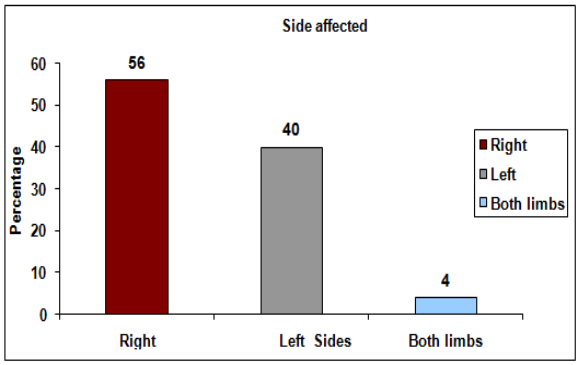


Figure 3: Side affected



3.2 Family history

7 patients had family history of similar complaints (14%).

Table 1: Symptomatology

Symptoms	No. of Cases	%
Pain	23	46
Dilated vein	41	82
Limb edema	02	04
Ulcer	09	18
Others (Skin changes etc.)	10	20

Figure 4: Venous system involvement

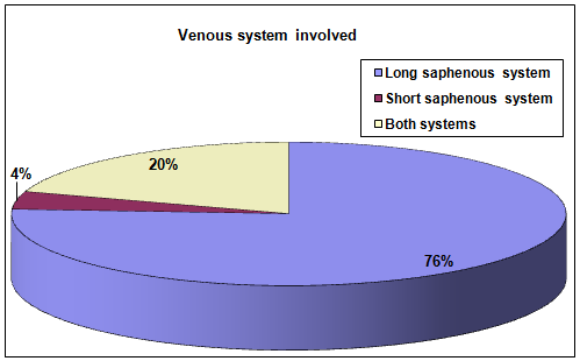


Figure 5: Perforator incompetence

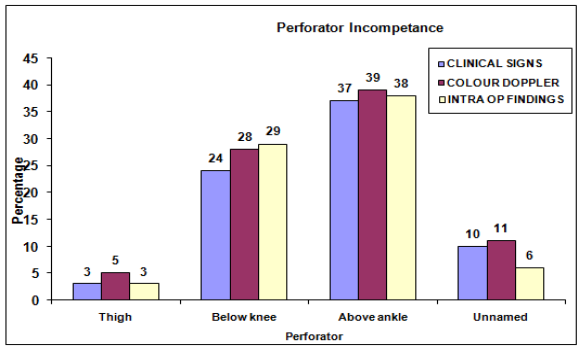


Table 2: Treatment given

Treatment Given	No.	%
SFJ flush ligation with stripping of LSV	9	18
SFJ flush ligation with stripping of LSV with incompetent perforator ligation	29	58
SFJ, SPJ ligation with stripping of LSV with incompetent perforator ligation	10	20
SPJ ligation without stripping of SSV	2	4
Total	**50**	**100**

Table 3: Complications

Complications	No. of Cases	Percentage
Seroma	3	6
Haematoma	2	4
Infection	1	2
Limb oedema	1	2
Paraesthesia	1	2
Delay healing	2	4
Recurrence	0	0

Table 4: Accuracy of clinical findings with intra operative findings

SFJI	Intra-op Findings		
Clinical	**Positive**	**Negative**	**Total**
Positive	46	2	48
Negative	0	2	2
Total	46	4	50

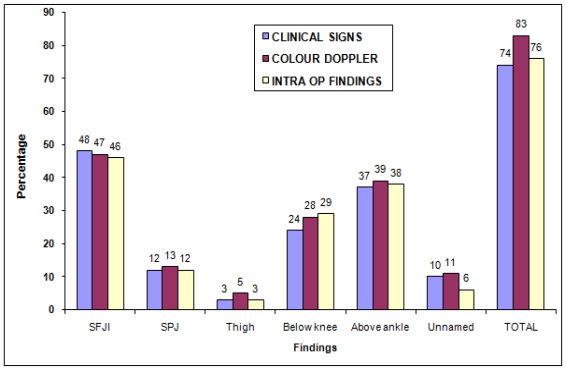
Sensitivity	46/46	100%
Specificity	2/4	50%
Positive predictive value	46/48	95.83%
Negative predictive value	2/2	100%
Accuracy	48/50	96%

Table 5: Accuracy of colour Doppler with intra operative findings

SFJI	Intra-op		
Colour Doppler	**Positive**	**Negative**	**Total**
Positive	46	1	47
Negative	0	3	3
Total	46	4	50

Sensitivity	46/46	100%
Specificity	3/4	75%
Positive predictive value	46/47	97.87%
Negative predictive value	3/3	100%
Accuracy	47/50	96%

Figure 6: Findings detected by various methods



4. Discussion

In our study, maximum number of patients 12 (24%) presented in the 31-40 years age group. The next common age group of presentation was 41-50 years with 11 (22%). This age distribution correlates well with other studies conducted by Campbell *et al*., who showed the commonest age at presentation to be 30-40 yrs.

Out of the 50 cases included in this study 39 cases (78%) were male with only 11 female patients (22%). This disparity may be due to the fact the patients are from the low socio-economic background and also cosmesis is not a concern, as these patients do not wear short clothes. All other studies show women to be affected more than men. [3]

A 14% (7 cases) familial incidence was noted in this series. De Takata[4]. In his series had shown that nearly 50 to 70% of the patients with varicose veins had a hereditary tendency, but this series showed a very low incidence.

In our study, in 28 (56%) cases, right lower limb was involved and in 20 (40%) cases left lower limb was involved and in 2 (4%) both limbs were involved.

In the present study, the commonest symptom in 41 (82%) cases was that of dilated, tortuous veins. 23 (46%) cases had complaints of pain in the affected limb and 2(4%) cases had limb edema, venous ulcer was present in 9 (18%) of cases. This findings correlate well with other studies done by Campbell *et al*, with cosmetic symptoms being 90% and aching pain 57%.

In this series, long saphenous vein was involved in 76% of cases (38 patients), the short saphenous vein in 4% (2 patients) and both long and short in 20% (10 cases). Delbe and Mocquet in their study had found varicosity of long saphenous vein in 98% and only 2% in short saphenous vein. Incompetent perforator was noted in 41 (82%) cases.

Doppler/Duplex scanning is the primary non-invasive method of assessing chronic venous insufficiency, which has an overall accuracy of 94%. This finding is in conformity of Masuda *et al* [5] who showed that duplex scanning had an overall accuracy of 88%. Nine patients had associated venous ulcers[6] that were all due to superficial venous incompetence.

Conservative treatment was given to all the patients pre-operatively with the idea of improving the limb and making it fit for surgery and post operative compression treatment was followed routinely to prevent haematoma formation after stripping and were advised elastic crepe bandage/stockings for three to four months. Sclerosant therapy was not tried in this series, because of the paucity and non-availability of the sclerosant agents and also because of presence of major incompetence.

Out of 50 cases, saphenofemoral junction ligation including the ligation of anatomically constant tributaries at its termination with stripping of long saphenous vein by Myers stripper upto the knee and ligation of incompetent perforator was done in 29 cases. Sapheno-popliteal flush ligation was done in 2 cases, SFJ and SPJ ligation with stripping of LSV in 10 cases. SSV was not stripped to avoid nerve injury. Flush ligation of SFJ and stripping of LSV was done in 9 cases.

4.1 Comparative analysis

In our study findings are depicted considering intra-operative findings as the 'reference gold standard.

Clinical examination detected saphenofemoral junction incompetence in all cases showing intra-operative saphenofemoral junction incompetence, making clinical testing 100% sensitive. Clinical examination ruled out presence of saphenofemoral junction incompetence in both the intra-operatively negative cases. Clinical examination had a specificity of 50% showing clinical examination may over diagnose cases of saphenofemoral junction incompetence increasing the cost of treatment and morbidity of the patient.

The positive predictive value of clinical examination is shown to be 95.83% i.e. in a significance proportion of cases clinical examination can truly detect saphenofemoral junction incompetence. The negative predictive accuracy of clinical examination is 100% i.e. clinical examination can definitely confirm the absence of saphenofemoral junction incompetence. The clinical examination shows an overall accuracy of 96%.

Diagnostic validity of color Doppler against intra-operative findings taken a referral gold standard for saphenofemoral junction incompetence shows the following –

Color Doppler detected all cases of operatively evident saphenofemoral junction incompetence, giving the test a high sensitivity of 100%. Color Doppler ruled out presence of saphenofemoral junction incompetence in 4 out of 5 intra-operatively negative cases, with a specificity of 75%, showing a much higher specificity compared to clinical examination. The positive predictive accuracy of color Doppler for saphenofemoral junction incompetence was 97.87% showing it to be higher than clinical examination 95.83%. The negative predictive accuracy of color Doppler for saphenofemoral junction incompetence was 100% showing that color Doppler can effectively rule out presence of saphenofemoral junction incompetence in

all intra-operative negative cases, reducing operative costs and patient morbidity. Color Doppler shows an overall accuracy of 94%. Diagnostic validity of clinical findings in comparison to color Doppler in saphenofemoral junction incompetence taking the latter as the gold standard shows-

Clinical examination detected all cases shown to have saphenofemoral junction incompetence by color Doppler with a sensitivity of 100%. Specificity i.e. the ability to detect all truly negative cases as shown by color Doppler is low (66.6%), there is a tendency to falsely predict the presence of saphenofemoral junction incompetence clinically.

Positive predictive accuracy of clinical examination is 97.9%; with a negative predictive value of 100% showing ability of clinical examination to rule out saphenofemoral junction incompetence in all color Doppler negative cases.

In our study we had a total of 74 perforators incompetent by clinical examination and 83 by color Doppler. Both combined (Intra-operative finding) 76 incompetent perforators. The commonest group of perforators that were incompetent was the above ankle group, 37 of them by clinical and 39 by Doppler examination and 38 of them intra-operatively. Out of the total incompetent perforators, we had 10 in unnamed areas by clinical examination and 11 by Doppler and 6 intra-operatively. We had 12 case of sapheno-popliteal incompetence detected by Doppler and confirmed at surgery. In our study, we encountered 6 cases of complication, the commonest being seroma (3 cases), which were subsided with drainage, and haematoma in 2 cases which cleared after about 15 days. There was no incidence of deep vein thrombosis or pulmonary embolism postoperatively in this series. Literature shows the incidence to be very low at 0.01%.

We had no recurrence of varicosity in our study with a follow up of a minimum of 6 months. In a small series of this study, it is difficult to assess the results of operative treatment as such assessment should be taken up after a long follow up period of at least five years.

5. Conclusion

Fifty cases of varicose veins of the lower limb have been studied in detail. An analysis of the data has enabled this study to arrive at the following conclusions.

- Varicosity of the lower limb is a fairly common clinical entity. The number of cases reporting to the hospital is much less than the real incidence; because in the absence of symptoms due to varicose veins patients do not seek treatment in our country.
- The commonest age group of patients suffering from varicose veins is 31 to 40 years.
- The involvement of long saphenous system is more common than the short saphenous system and right limb is affected more common. For incompetent perforators, extra fascial ligation results are in par with sub fascial ligation.
- Clinical examination has a high predictive accuracy. It gives sufficient information to treat the patients in centers where color Doppler is not available or affordable.
- The use of color Doppler is a valuable supplement to clinical examination for effective treatment of varicose veins and its use is strongly recommended to prevent recurrences and reduce morbidity as it is effective tool in detecting venous incompetence.
- SPJ junction is highly variable and should always be marked pre-operatively using Doppler.
- The outcome of cases of primary varicose veins depends on a thorough and complete clinical examination and duplex scan by an experienced radiologists.
- Operative line of treatment is a primary procedure in the management of varicose veins of lower limbs. LSV stripping up to knee and non stripping of SSV is associated with less morbidity.
- Complications are negligible if cases are meticulously selected and operated. The present procedures enable the patient to lead almost normal life after surgery and the mortality rate is very negligible.
- Though the newer trends in the management of varicose veins are showing good results, they need a long term follow up. The people are not affordable for such treatment due to cost factor. Hence there is a need of medical insurance to achieve social justice.

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