A PROSPECTIVE STUDY ON CLINICO-PATHOLOGY OF VARICOSE VEINS AND ITS' SURGICAL MANAGEMENT

General Surgery

Dr. Omprakash

Final Yr Ms General Surgery Postgraduate, Department of general surgery, Meenakshi medical college and hospital, enathur, kanchipuram.

Dr.K.Govardhanan

Professor Department of general surgery, Meenakshi medical college and hospital, enathur, kanchipuram.

ABSTRACT

Background: Varicose veins primarily considered to be a cosmetic problem have been widely mistaken to be medically unimportant and given low priority for treatment. The associated pain, swelling, open ulceration and other morbidities increase cost of its management. The debilitation adds on to the time lost from work and wages.

Aim: To study the aetiology, pathology, presentation, complications, and management of varicose veins in the study populations.

Methods: The current study followed a prospective observational study design among 60 patients visiting Meenakshi Medical College Hospital and Research Institute with symptoms and signs of varicose veins and clinically diagnosed as having varicose veins. Various presentations and complications and treatments were noted and finally followed up for minimum of 6 months.

Results and Conclusion: It is found that varicose veins and their associated symptoms and complications constitute the most common chronic vascular disorders leading to surgical treatment. The incidence is on the rise. It is more common in middle-aged group and in males. Patients presented with spectrum of symptoms and signs, dilated and tortuous veins being more common presentations.

Long saphenous system is the most common venous system affected. Ankle (lower perforator being the most common incompetent perforators). The outcome of cases of primary varicose vein depends on a thorough and complete clinical examination and duplex scan by an experienced radiologist.

Operative line of treatment is a primary procedure in the management of varicose veins of lower Stripping of LSV up to knee and non-stripping of SSV is associated with less morbidity. Accurate assessment reduces the risk of recurrent varicose veins. There must be ample support from the Government so that even the poor will be benefited from the newer modality of treatment of varicose veins.

KEYWORDS

INTRODUCTION

Varicose veins arise due to incompetence in valves of deep, superficial and/or perforating veins. This incompetence leads to reflux of blood causing increase in venous pressure resulting in dilated, elongated, or tortuous subcutaneous veins of lower legs.¹

This condition is primarily considered to be a cosmetic problem and widely mistaken to be medically unimportant and given low priority for treatment.^{2,3} However, the fact is that the associated pain, swelling, open ulceration and other morbidities increase cost of its management.^{2,3} The debilitation adds on to the time lost from work and wages.⁴

In Indian set up it has been identified as a common surgical problem in low socio-economic groups and has also resulted in change of occupation out of compulsion.⁵ It is not surprising that several studies have found that it affects the quality of life (QoL) of the individual.^{6,7}

Despite it being a common condition affecting adolescents to elderly, the etiological aspect of it is not completely understood.^{1,2,8} Moreover, the type of patients who tend to be more vulnerable to the severity or complications in this condition is also not known.⁸

Other issues like absence of definitive system to identify which type of patient will benefit the most from a particular surgical intervention or lack of an established framework for its diagnosis and management needs to be resolved.⁸ The wide range of presentation in varicose veins also makes the management strategies a test of skill for the healthcare professional.⁹ Thus, large regional differences in management practices of varicose veins has been reported not only in India but also in developed countries like United Kingdom.⁸

It was therefore essential to compare regional management practices in different patient types and disease presentations with national and international guidelines to give an overview about the same to health care professionals in the present settings.

This study was hence done to aetiology, pathology, presentation, complications, and management of varicose veins in the study population.

AIM AND OBJECTIVES

Aim: To study the aetiology, pathology, presentation, complications and management of varicose veins in the study populations.

Objectives:

1. To study the distribution of risk factors, etiopathogenesis and complications of varicose veins.
2. To study the prevalence of varicose veins in the study population.
3. To study the various modalities of treatment available for varicose vein both conservative and surgical.
4. Long term follow up of patients who have undergone treatment.

METHODOLOGY

STUDY DESIGN

The current study followed a prospective observational study design done to describe the aetiology, pathology, presentation, complications, and management of varicose veins in the study population.

STUDY SETTING

The study was conducted in Meenakshi Medical College Hospital and Research Institute, a tertiary care teaching hospital located in Kancheepuram of Tamilnadu.

STUDY PERIOD

The study was conducted for a period of two years from November 2018 to October 2020. The timeline of the study is enclosed in

Annexure.

STUDY POPULATION

Patients visiting Meenakshi Medical College Hospital and Research Institute with symptoms and signs of varicose veins and clinically diagnosed as having varicose veins.

INCLUSION CRITERIA

Patients coming to the Hospital with symptoms and signs of varicose veins and clinically diagnosed as having varicose veins and willing for surgery were included, after taking informed written consent.

EXCLUSION CRITERIA

1. Varicose veins with pregnancy.
2. Patients less than 15 years.
3. Secondary varicose veins.
4. Disease involving deep venous system.

SAMPLE SIZE

The required sample size for the study was calculated using the formula for single proportion.

Assuming that 10% of the subjects in the population have varicose veins, and a population size of 100 (the number of varicose vein patients seen in the OPD per year), the study would require a minimum sample size of: **59**

for estimating the expected proportion with 5% absolute precision and 95% confidence. Hence, a total of 60 patients were enrolled for the study.

SAMPLING METHOD

Universal sampling

All the patients satisfying the inclusion and exclusion criteria during the data collection period were enrolled for the study.

SOURCE OF DATA

The data for the study was obtained from the patients admitted and treated in Meenakshi Medical College Hospital and Research Institute from January 2019 to May 2020.

METHOD OF DATA COLLECTION

Patients presenting with signs and symptoms of varicose veins from the year 2019 January onwards and till May 2020 at Meenakshi Medical College Hospital and Research Institute who were diagnosed as having varicosities of the superficial veins by clinical examination, were taken up for the study, after the nature of the disease were established and various modalities of treatment were available. Written informed consent was taken. And various presentations and complications and treatments were noted and finally followed up for minimum of 6 months.

CLINICAL EXAMINATION

History and examinations were completed as mentioned in the proforma. The patient was examined in standing position with good illumination, exposing both the lower limbs completely. The following tests were performed:

- Brodie trendelenburg I and II
- Modified Perthe'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.

COLOR DOPPLER ULTRASONOGRAPHY

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 important things noted were

- Saphenofemoral junction incompetence
- Saphenopopliteal junction incompetence
- Perforator incompetence
- Deep venous system
- Presence of abnormal or unnamed veins or perforators.

OPERATIVE PROCEDURES

The following operative procedures were undertaken depending upon clinical and Doppler findings.

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

After dressing the wound, graded pressure bandage was applied with the help of Elastic crepe bandage. Wound were reviewed on day five and assessed about wound healing and looked for any complications.

FOLLOW-UP

All patients were discharged around 7-10 days after surgery with elastic crepe bandage and some of the patients who had complications had to stay back.

They were all followed up at 15 days, 1, 3 and 6 months. The following points were observed on follow up:

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

ETHICAL ISSUES

The study was approved by the Institutional Human Ethical Committee. Written, informed consent was obtained from the participants before the survey. Privacy and confidentiality were maintained throughout the study period. An explicit participant information sheet had been prepared in both English and the regional language (Tamil). This document made the subjects understand all the details of the study before providing consent.

STATISTICAL ANALYSIS

The data was entered into Microsoft excel and analysed using SPSS version 16. The categorical variables (e.g. age category, surgery done, complications, etc.,) were represented as number and percentage. The graphical representation of the variables was done using pie chart, clustered column and bar chart. Chi-square test was done to find out the significant variables associated with complications and recurrence. P value of less than 0.05 was considered significant.

RESULTS:

Table 1: Age distribution of the patients (n=60)

Age category	Frequency		Percent
	21-40 years	41-60 years	
	18	31	30.0
		11	51.7
		11	18.3
	Total	60	100.0

Figure 1: Graphical representation of the age distribution of the patients (n=60)

Table 1 and Figure 1 shows the age distribution of the patients. Majority of the patients (51.7%) were in the age group of 41-60 years followed by 30% of patients between 21-40 years.

Table 2: Gender distribution of the patients (n=60)

Gender	Frequency		Percent
	Female	Male	
	18	42	30.0
			70.0
	Total	60	100.0

Figure 2: Graphical representation of the gender distribution of the patients (n=60)

Table 2 and Figure 2 shows the gender distribution of the patients. More than two-third of the patients were males.

Table 3: Age versus gender distribution of the patients (n=60)

		Gender, n(%)	
		Male	Female
Age category	21-40 years	12 (66.7)	6 (33.3)
	41-60 years	21 (67.7)	10 (32.3)
	61-80 years	9 (81.8)	2 (18.2)

Figure 3: Graphical representation of the age versus gender distribution of the patients (n=60)

Table 3 and figure 3 shows the age versus gender distribution of the patients. There was almost similar distribution of males and females across all age groups.

Table 4: Side of presentation of varicose veins among the patients (n=60)

		Frequency	Percent
Side of presentation	Bilateral	16	26.7
	Left side	21	35.0
	Right side	23	38.3
	Total	60	100.0

Figure 4: Graphical representation of the side of presentation of varicose veins among the patients (n=60)

Table 4 and Figure 4 shows the side of presentation of varicose veins among the patients. Majority of varicose veins presented on the right side followed by 35% on the left side. About 27% of patients had bilateral presentation of varicose veins.

Table 5: Familial history of varicose veins among the patients (n=60)

		Frequency	Percent
Familial History	No	50	83.3
	Yes	10	16.7
	Total	60	100.0

Table 6: Occupational history of varicose veins among the patients (n=60)

		Frequency	Percent
Occupational history	No	40	66.7
	Yes	20	33.3
	Total	60	100.0

Figure 5: Graphical representation of the familial and occupational history of varicose veins among the patients (n=60)

Table 5, table 6 and figure 5 shows the presence of familial history and

occupational history of varicose veins among the patients. About 17% of patients had family history and one-third (33.3%) had occupational history of varicose veins.

Table 7: Duration of hospital stay among the patients (n=60)

	Frequency	Percent
6-10 days	21	35.0
11-15 days	15	25.0
>15 days	24	40.0
Total	60	100.0

Figure 6: Graphical representation of duration of hospital stay among the patients (n=60)

Table 7 and Figure 6 shows the duration of hospital stay among the patients. Majority of the patients (40%) had a hospital stay for more than 15 days.

Table 8: Symptoms presented by the patients with varicose veins (n=60)

Symptoms presented	Frequency	Percent
Dilated veins	20	33.3
Pain in legs	11	18.3
Venous ulcer	10	16.7
Darkening of skin	8	13.3
Itching	4	6.7
Chronic swelling of limbs	3	5.0
Bleeding from trauma	2	3.3
Tender swellings & superficial phlebitis	2	3.3
Total	60	100.0

Figure 7: Graphical representation of the symptoms presented by the patients with varicose veins (n=60)

Table 8 and figure 7 shows the symptoms presented by the patients with varicose veins. The top 3 symptoms presented were dilated veins (33.3%), pain in legs (18.3%) and venous ulcer (16.7%).

Table 9: Venous system involved with the varicose veins among the patients (n=60)

		Frequency	Percent
Venous System involved	Both Systems	17	28.3
	Long Saphenous System	37	61.7
	Short Saphenous system	6	10.0
	Total	60	100.0

Figure 8: Graphical representation of the venous system involved with the varicose veins among the patients (n=60)

Table 9 and figure 8 shows the venous system involved with the varicose veins among the patients. The long Saphenous system was the most involved venous system (62%) followed by both long and short venous systems (28%). The short saphenous system was involved in 10% of the patients.

Table 10: Distribution of the venous system involved among the age and gender categories (n=60)

		VENOUS SYSTEM INVOLVED, n (%)		
		Long Saphenous System	Short Saphenous System	Both Systems
Age category	21-40 years	12 (66.7)	1 (5.6)	5 (27.8)
	41-60 years	18 (58.1)	4 (12.9)	9 (29.0)
	61-80 years	7 (63.6)	1 (9.1)	3 (27.3)
Gender	Male	25 (59.5)	5 (11.9)	12 (28.6)
	Female	12 (66.7)	1 (5.6)	5 (27.8)

Figure 9: Graphical representation of the distribution of the venous system involved among the age and gender categories (n=60)

Table 10 and figure 9 shows the distribution of the venous system involved among the age and gender categories. There was almost equal representation of the venous systems among the age and gender categories.

Table 11: Perforator incompetence location among the patients with varicose veins (n=60)

Perforator Incompetence	Above ankle	Frequency	Percent
	Below knee	35	58.4
	Thigh	17	28.3
	Total	8	13.3
		60	100.0

Figure 10: Graphical representation of the perforator incompetence location among the patients with varicose veins (n=60)

Table 11 and Figure 10 shows the location of perforator incompetence among the patients with varicose veins. Majority of the patients had perforator incompetence above the ankle (59%) followed by below knee (28%).

Table 12: Distribution of the perforator incompetence among the age and gender categories (n=60)

		PERFORATOR INCOMPETENCE		
		Above ankle	Below knee	Thigh
Age category	21-40 years	10 (55.6)	6 (33.3)	2 (11.1)
	41-60 years	18 (58.1)	10 (32.3)	3 (9.7)
	61-80 years	7 (63.6)	1 (9.1)	3 (27.3)
Gender	Male	27 (64.3)	10 (23.8)	5 (11.9)
	Female	8 (44.4)	7 (38.9)	3 (16.7)

Figure 11: Graphical representation of the distribution of the perforator incompetence among the age and gender categories (n=60)

Table 12 and figure 11 shows the distribution of the location of perforator incompetence among the age and gender categories. There was almost equal representation of the perforator incompetence location among the age and gender categories.

Table 13: Surgical treatment done on the patients with varicose veins (n=60)

Procedure done	Frequency	Percent
SFJ ligation + stripping of GSV	7	11.7
SFJ ligation + stripping of GSV + perforator ligation	29	48.3
SFJ ligation + stripping of GSV + perforator ligation + SPJ ligation	18	30.0
SFJ ligation without stripping of GSV	6	10.0
Total	60	100.0

Figure 12: Graphical representation of the surgical treatment done on the patients with varicose veins (n=60)

Table 13 and figure 12 shows the surgical treatment done on the patients with varicose veins. Majority of the patients (48.3%) underwent SFJ ligation + stripping of GSV + perforator ligation followed by SFJ ligation + stripping of GSV + perforator ligation + SPJ ligation (30%).

Table 13: Distribution of the surgery procedure done for varicose veins among the age categories (n=60)

TREATMENT GIVEN	Age category		
	21-40 years	41-60 years	61-80 years
SFJ ligation + stripping of GSV	2 (28.6)	3 (42.9)	2 (28.6)
SFJ ligation + stripping of GSV + perforator ligation	9 (31.0)	13 (44.8)	7 (24.1)
SFJ ligation + stripping of GSV + perforator ligation + SPJ ligation	6 (33.3)	11 (61.1)	1 (5.6)

SFJ ligation without stripping of GSV	1 (16.7)	4 (66.7)	1 (16.7)
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Table 14: Distribution of the surgery procedure done for varicose veins among the gender categories (n=60)

TREATMENT GIVEN	Gender	
	Female	Male
SFJ ligation + stripping of GSV	3 (42.9)	4 (57.1)
SFJ ligation + stripping of GSV + perforator ligation	9 (31.0)	20 (69.0)
SFJ ligation + stripping of GSV + perforator ligation + SPJ ligation	5 (27.8)	13 (72.2)
SFJ ligation without stripping of GSV	1 (16.7)	5 (83.3)

Figure 13: Graphical representation of the distribution of the surgery procedure done for varicose veins among the age and gender categories (n=60)

Table 13, table 14 and figure 13 shows the distribution of the surgery procedure done for varicose veins among the age and gender categories. There was almost equal representation of all the surgical procedures among the age and gender categories.

Table 15: Complications due to varicose veins among the patients (n=60)

Complication	No	Frequency	Percent
	Yes	22	36.7
	Total	60	100.0

Figure 14: Graphical representation of the presence of Complications due to varicose veins among the patients (n=60)

Table 15 and figure 14 shows the presence of complications due to varicose veins among the patients. More than one-third patients (36.7%) had complications of varicose veins.

Table 16: Type of Complications due to varicose veins among the patients (n=60)

Type of Complication		Frequency	Percent
	Seroma	6	27.3
	Haematoma	2	9.1
	Infection	4	18.2
	Limb oedema	1	4.5
	Delayed healing	9	40.9
	Total	22	100.0

Figure 15: Graphical representation of the type of Complications due to varicose veins among the patients (n=60)

Table 16 and figure 15 shows the type of Complications due to varicose veins among the patients. Delayed healing of ulcer (40.9%), seroma (27.3%) and infection (18.9%) were the top three complications due to varicose veins.

Table 17: Distribution and the association of the complications for varicose veins among the age and gender categories (n=60)

		COMPLICATION, n (%)		P value*
		Yes	No	
Age category	21-40 years	3 (16.7)	15 (83.3)	0.009
	41-60 years	11 (35.5)	20 (64.5)	
	61-80 years	8 (72.7)	3 (27.3)	
Gender	Female	4 (22.2)	14 (77.8)	0.044
	Male	18 (42.9)	24 (57.1)	

*p value by chi-square test

Figure 15: Graphical representation of the distribution of the complications for varicose veins among the age and gender categories (n=60)

Table 17 and figure 15 shows the distribution and association of the complications done for varicose veins among the age and gender categories. Higher age category and male gender were significantly associated ($p < 0.05$) with development of complications.

Table 18: Distribution of the complications done for varicose veins among the various surgical procedures (n=60)

TREATMENT GIVEN	COMPLICATION, n(%)		P value*
	Yes	No	
SFJ ligation + stripping of GSV	3 (42.9)	4 (57.1)	0.751
SFJ ligation + stripping of GSV + perforator ligation	11 (37.9)	18 (62.1)	
SFJ ligation + stripping of GSV + perforator ligation + SPJ ligation	7 (38.9)	11 (61.1)	
SFJ ligation without stripping of GSV	1 (16.7)	5 (83.3)	

*p value by chi-square test

Figure 16: Distribution of the complications done for varicose veins among the various surgical procedures (n=60)

Table 18 and figure 16 shows the distribution of the complications done for varicose veins among the various surgical procedures. There was almost equal representation of complications among all the surgical procedures and though not significantly associated.

Table 19: Recurrence of varicose veins among the patients (n=60)

Recurrence of Varicose Veins	Frequency	Percent	
	No	54	90.0
	Yes	6	10.0
Total	60	100.0

Figure 17: Graphical representation of the recurrence of varicose veins among the patients (n=60)

Table 19 and figure 17 shows the recurrence of varicose veins among the patients. About 10% of the patients had recurrence of varicose veins.

Table 20: Distribution and association of the recurrence of varicose veins among the age and gender categories (n=60)

		Recurrence of Varicose veins, n (%)		P value*
		Yes	No	
Age category	21-40 years	2 (11.1)	16 (88.9)	0.437
	41-60 years	4 (12.9)	27 (87.1)	
	61-80 years	0	11 (100.0)	
Gender	Female	2 (11.1)	16 (88.9)	0.426
	Male	4 (9.5)	38 (90.5)	

*p value by chi-square test

Figure 19: Graphical representation of the distribution of recurrence of varicose among the age and gender categories (n=60)

Table 20 and figure 19 shows the distribution and association of the recurrence of varicose veins among the age and gender categories. Both age and gender categories were not significantly associated ($p>0.05$) with recurrence of varicose veins. There was almost equal representation of recurrence of varicose veins among the age and gender categories.

Table 21: Distribution and association of the recurrence of varicose veins among the various surgical procedures (n=60)

TREATMENT GIVEN	Recurrence of Varicose veins, n(%)		P value*
	Yes	No	
SFJ ligation + stripping of GSV	0	7 (100.0)	<0.001
SFJ ligation + stripping of GSV + perforator ligation	1 (3.4)	28 (96.6)	
SFJ ligation + stripping of GSV + perforator ligation + SPJ ligation	1 (5.6)	17 (94.4)	
SFJ ligation without stripping of GSV	4 (66.7)	2 (33.3)	

*p value by chi-square test

Figure 20: Graphical representation of the distribution of the recurrence of varicose veins among the various surgical procedures (n=60)

Table 21 and figure 20 shows the distribution and association of the recurrence of varicose veins among the various surgical procedures. SFJ ligation without stripping of GSV was significantly associated ($p<0.05$) with recurrence of varicose veins.

DISCUSSION:

In our study, maximum number of patients (52%) were present in the 41-60 years age group. The next common age group of presentation was 21-40 years and 61-80 years both with 30% and 18.3% respectively. This age distribution is higher than the studies conducted by Campbell et al., who showed the commonest age at presentation to be 30-40 yrs.

Out of the 60 cases included in this study 42 cases (70%) were male and only 18 were female patients (30%). This disparity may be due to the fact that the patients are from the low socio-economic background and cosmetics are not a concern, as these patients do not wear clothes exposing their legs. Edinburgh study showed that the age adjusted prevalence of trunk varices was higher in men (39.7%) than women (32.2%). Whereas all other studies such as, Bulgarean study, Finland, Bobek et al, A.P.Wright et al and San Diego Population study showed women to be affected more than men.

Table 22: Incidence of varicose veins

Study	Men	Women
San Diego population study	35.3%	64.7%
A.P. Wright et al	36%	64%
Edinburgh study	39.7%	32.2%

In our study, in 23 (38%) cases, right lower limb was involved and in 21(35%) cases left lower limb was involved and in 16(26.7%) both the limbs were involved.

A positive occupation history was present in 17% of the cases. One third (33.3%) familial incidence of varicose veins was noted in this series. Effect of family history, Finland³⁰ showed high prevalence rate but incidence substantially less than what is usually proposed in literature.

In the present study, the commonest complaint was dilated and

tortuous veins in 33.3% of cases. 11 (18%) cases had complaints of pain in the affected limb and 8 (13.3%) cases had darkening of skin around ankle. Venous ulcer was present in 10 (16.7%) cases.

This finding does not correlate well with studies done by Campbell et al in which cosmetic symptoms were in 90% and aching pain 57%. The reason for this could be people from low socio-economic background whose cosmetic demands are low and also poor self-care and delay in seeking a doctor for treatment.

In this series, long saphenous vein was involved in 62% of cases (37 patients), the short saphenous vein in 10% (6 patients) and both long and short in 28% (17 cases). Delbe and Mocquet in their study had found varicosity of long saphenous vein in 98% and 2% in short saphenous vein.

In our study we had a total of 45 incompetent perforators by clinical examination and 101 by colour Doppler. The commonest group of perforators that were incompetent was the above Ankle group, 25 of them by clinical and 59 by Doppler examination. Out of the total incompetent perforators, we had 3 in unnamed areas by clinical examination and 10 by Doppler.

Table 23: Prevalence of anatomic location of GSV with reflux by Engelhom et al

SFJ	12%
Thigh segment	37%
Knee segment	16%
Calf segment	58%

Compressive treatment was given to all the patients who presented with venous ulcer with the idea of improving the Out of 10 patients, 6 patients showed signs of healing at the end of 3 weeks. All were taken for surgery following which in 9 patients (90%) ulcer healed. Ulcer recurred in 1 patient (10%). Barwell JR ET al³¹ and Michaels JA, Campbell WB, Brazier JE, et al too showed Similar findings.³²

There is a considerable difficulty in comparing the various forms of mechanical and surgical compression therapy for the treatment of venous ulcer. Two major reviews independently concluded that insufficient evidence exist to favour one form of compression over other. Comparisons are hampered by

- A minimum of randomized controlled studies
- Different criteria for patient entry into studies
- Variable use of compression as an adjunct to surgical therapy and
- Variable compliance with post-operative compression therapy.

Zamboni and colleagues randomized 80 consecutive patients with 87 venous leg ulcers to treatment with compression or minimally invasive surgery. Healing rates were remarkable in both groups, 100% at 31 days in surgical group versus 96% at 63 days in compression group. At 3 years follow-up, ulcers had recurred in 9% of the surgical group and in 38% of the compression group.

British study randomized 76 patients with venous ulcers to treatment with a four layered bandaging system or superficial venous surgery and a four layered bandaging system. Healing occurred in 64% of the compression group and 68% of the surgical group with no significant difference in time to ulcer healing.

The ESCHAR trial³¹ is the largest trial that evaluated the addition of superficial venous surgery to compression therapy for the treatment of venous ulceration. Patients with severe sequelae of CVI and superficial or mixed deep and superficial venous insufficiency were randomized to medical therapy either with or without surgical treatment of superficial venous reflux. Although no difference was found in rates of healing there was a dramatic reduction in ulcer recurrence. This study has been criticized for using class II rather than class III stockings. In addition, it is notable that 20% of the surgical arm refused surgery but remained in the surgical arm according to an intention-to-treat analysis plan. This probably resulted in understating the treatment effect of surgery.

Michaels and colleagues recently carried out a RCT that examined the impact of superficial venous surgery on quality of life in 246 patients with uncomplicated varicose veins who were randomized to compression and life style changes versus surgery with ligation and stripping of refluxing segments and multiple phlebectomies. The study

was well designed and in cooperated surgical group showed clinically relevant changes in health status. The significant improvement in quality adjusted life years over the group treated with compression. In addition, surgical group demonstrated significant anatomic and symptomatic relief. These large RCTs provide a grade A recommendation for surgery in addition to conservative treatment in patients with varicose veins caused by GSV reflux.

Table 24: Surgery Vs Conservative Management

Study/ Year	Intervention 1/ No. of patients	Intervention 2/ No. of patients	Follow -up
Micheals et al/2006	Flush ligation of reflux+ GSV stripping /124	Conservative management /122	2 years
VanGent et al/ 2006	Subfacial endoscopic perforating vein surgery + compression therapy /97	compression therapy /102	2 years
Gohel et al/2001 and Barwell et al/ 2004	Saphenous surgery +compression therapy/ 242 /258	compression therapy /258	4 years

Post-operative compression treatment was given to all patients routinely. Elastic crepe bandage/stockings were advised to all for three to four months.

It is common practice to employ limb compression for a period of time following treatment, with the intention of assisting in successful target vein occlusion and reducing pain, swelling and bruising. There is considerable variation in the type and duration of compression employed, with no consensus as to best practice.

Compression therapy has a established role in the conservative management of venous disease.

- It combats venous hypertension
- Promoting antegrade flow of blood from the leg
- Improving calf muscle function
- Decreasing venous reflex.

However, on majority of patients with non-ulcerated varicose veins it is not the optimal treatment, as there is a level 1 evidence that conventional surgery offers greater improvement in quality of life. In venous ulcer disease compression has a clear role, both increasing healing rates and reducing recurrence.

The fundamental problem with compression is that its benefit is conferred only when compression is in place, yet compliance is poor, up to 63% of patients are non-compliant with in 1 year, and non-compliance is high even in the presence of ulceration. Poor compliance may be due to

- Socio-economic factors,
- Poor education,
- Discomfort and
- Cosmetic concern.

In an elderly population, the patient ability to apply the compression stocking is a factor. one study demonstrated that 15 per cent were physically unable to apply compression stocking and 26 per cent needed considerable help.

The role of compression following intervention treatment is unclear. It is thought to reduce pain, complications such as

- swelling,
- Bleeding,
- Bruising,
- Hematoma
- Deep vein thrombosis.

Following some treatment, such as UGFS, it may even increase the efficacy of the procedure. It has been suggested that compression may be one of the factors responsible for the observed variation in efficacy of UGFS.

The systemic review shows that there is limited evidence to base any guidance on compression regimens following treatment for varicose veins. Even when confining review to RCTs, there are concerns with the overall methodological quality of the included studies. The most

significant flaw is inadequate sample size. Heterogeneity of the regimens compared, and of the outcomes and their timing, preclude any meaningful meta-analysis

The only significant finding was from an RCT comparing 2 versus 7 days of compression after EVLA, which reported beneficial effects for 7 days of compression. In contrast, a single study found that stopping compression after just 3 days following surgery was associated with a more rapid return of work. Neither of these results appeared sufficiently strong to form the basis of any recommendation about practice.

A key confounder in all studies of compression treatment for venous disease is the issue of compliance. Most RCTs did not report this outcome. The only study that examined it found extremely high level of non-compliance. Although non-compliance does not strictly impact upon a study analyzed by intention to treat, it is important to establish whether there are any benefits to compression where it is used successfully.

A study of management of varicose veins among United Kingdom vascular surgeons in 2006 reported that elasticated bandages remained the most prevalent form of compression after treatment, with 77 per cent of respondents changing these for compression stocking subsequently, but with highly diverse regimens and durations. There is currently insufficient information to make any recommendations about compression therapy after intervention for varicose veins.

Table 25: Compression Therapy Following Varicose Vein Surgery of Patients

AUTHOR/ YEAR	INCLUSION CRITERIA	NO. OF PATIENTS
Biswas/2007	Primary varicose vein surgery for GSV reflux	Short duration:110 Long duration:110
Houtermans Aucker/2009	CEAP stage C ₂ or C ₃	Short duration:52 Long duration:52

Sclerosant therapy was not tried in this series, because of presence of major incompetence and also study mainly included primary cases.

None of 60 cases were conservatively managed. Saphenofemoral junction ligation including the ligation of tributaries at its termination with stripping of long saphenous vein by Myers stripper up to the knee and ligation of incompetent perforator was done in 29 cases.

Sapheno-popliteal flush ligation was done in 6 cases. SFJ and SPJ ligation with stripping of LSV in 18 cases. SSV was not stripped to avoid nerve injury. Flush ligation of SFJ and stripping of LSV was done in 7 cases.

Post op complications were seen in 22 (37%) of the cases. The most common was delayed wound healing 9(15%). Seroma in 6 pts, Hematoma in 2 pts, which got cleared by itself in 2 weeks others were wound infection in 4(6.7%). Defty C, Eardley TaylorM, et al³³ report around 18-20% of post op complications.

There was no incidence of deep vein thrombosis or pulmonary embolism post operatively in this series. Literature shows the incidence to be very low at 0.01%. Eleven studies reported on these outcomes, but only five reported that any such complication had actually occurred. The three trials reporting the highest number of adverse events include Wright et Rasmussen et al and Shadid et al.

Recurrence of incompetence was found in 5% at SFJ and 26% at SPJ. This pattern is very similar when compared to van AM et al³⁴ who showed similar results. However, the time period for follow up was not sufficient and also number of cases included could be small to assess the true incidence of recurrence.

Table 26: Recurrence Following Varicose Vein Surgery

STUDY	RECURRENCE
Creton	19.4%
Dwerryhouse et al	6%
Glass	25%
De Maesseneer et al	5%

About 74% of the patients were discharged in 10 days and 5% had to stay for more than 15 days. The mean time taken to return to normal activities were 15 to 18 days.

Comparative Analysis

In our study findings are depicted considering duplex findings as the 'reference gold standard'.

Table: 27

Sites	Clinical findings	Duplex findings	Sensitivity
SFJ	62	76	82
SPJ	8	19	42
Perforator	65	130	50

Clinical examination detected saphenofemoral junction incompetence in 43 cases out of 52, making clinical testing 83% sensitive. Sensitivity of clinical examination for detecting SPJ and perforator incompetence with reference to Doppler are 42% and 50% respectively. These findings are almost similar to the findings of V Wills, D Moylan, J Chambers et al.³⁵

In advanced CVD, skin integrity may be compromised thus making it important to maintain the health of the skin to prevent skin breakdown and infection. The development of eczematous dermatitis may require treatment with topical steroids. With venous ulcers, controlling bacterial overgrowth with aggressive wound care may facilitate wound healing. A variety of hydrocolloids and foam dressings are available to manage wound fluid drainage and maceration of adjacent skin. In the presence of an infected ulcer bed, silver- impregnated dressings have been effective in controlling infection and restoring tissue integrity. However specific evidence- based guidelines are lacking, there is significant variation in practice pattern of wound and skin management. Further studies are required to define skin and wound management.

Biological human skin substitutes derived from tissue engineering have been used in treating difficult -to heal- ulcers with success. In a randomized trial of 233 patients, subset analysis found a benefit of graft skin in healing venous ulcers that were present for longer than 1 year(47% versus 19%). However, there was no difference in ulcer recurrence rates. An extracellular matrix consisting of small intestinal mucosa was found in a randomized trial of 120 patients to improve venous ulcer healing (55% versus 34%), with no recurrence at 6-month follow up.

The past 15 years have seen revolutionary developments in the treatment of varicose veins as new methods have been introduced and adopted widely. Historically thorough surgery (typically saphenofemoral or saphenopopliteal ligation with stripping of the incompetent truncate vein and phlebectomies) was the standard and remains so as a comparator for any approach. Endothermal techniques have become commonly used as alternatives to ligation and stripping, these ablate the great or small saphenous vein by passage of a radiofrequency or laser catheter up the vein under duplex ultrasound guidance. Conventional sclerotherapy continues to be used for selected veins of limited extent, but ultrasound-guided foam sclerotherapy has become a popular method of treatment for more extensive varicose veins. Endothermal ablation and foam sclerotherapy were initially adapted with patchy and rather inadequate evidence driven by a desire for less invasive methods, enthusiasm to innovate, and financial motives in private practice.

National institute for health and care excellence³⁶ in the UK, which has recommended a sequential approach to choosing the treatment for any patient with varicose veins. It ranks endothermal ablation as the method of first choice, followed by foam sclerotherapy (if endothermal ablation is unsuitable) and surgery as the third option (if foam sclerotherapy is unsuitable). These recommendations have been the subject of considerable debate and it is worth examining them in the context of the most recent studies, as part of a general overview of our current knowledge.

The recommendation of NICE guidelines was based on the literature review conducted in 2012. This provided no convincing evidence of differences in the clinical effectiveness of either endothermal ablation or foam sclerotherapy compared with surgery but a slight advantage of endothermal ablation over foam sclerotherapy. Cost-effectiveness was therefore an important influence and cost modelling concluded that endothermal treatment had some advantage over both foam sclerotherapy and surgery. These were the considerations on which the recommendations were based The NICE guidance identified areas of uncertainty that would benefit from further research-in particular

whether different treatments might be appropriate for varicose veins of different stages of clinical severity and whether adjuvant treatment is better given at the same time as endothermal ablation, or at a later rate if required.

The new studies provide some good comparative data and also information about longer-term follow-up, but they have not produced consistent or compelling findings that one treatment is clinically better than other. The thorough systemic review and network meta-analysis by Carroll and colleagues³⁷ included nearly 4000 patients from 34 randomized clinical trials. It concluded that there were negligible differences in clinical and quality-of-life outcomes between endothermal ablation, foam sclerotherapy and surgery. It exposed differences that are well recognized such as more discomfort in the immediate period after surgery, but no important differences in outcomes in the medium or long term.

Carroll et found that endothermal ablation costs more than surgery, for a minimal difference in quality- adjusted life years. They suggested that foam sclerotherapy may well offer the most cost-effective alternative to surgery, because its higher recurrence rate is offset by substantially lower treatment costs. These contrasts with the conclusions of the NICE guidelines, which prioritized endothermal ablation as the first treatment option, based largely on a different calculation of cost-effectiveness.

Despite all these publications there is no firm evidence that one method treating varicose veins is universally the best. To an extent, the trails are blunt instruments in choosing the right treatment for each patient. Vascular specialties will continue to make judgment based on clinical factors that have not been the subject of rigorous assessment.

The NICE clinical guidelines has made a bold attempt to steer practice based on now arguable evidence but it has helped to focus the debate and to identify important research questions. Many of the uncertainties are likely to persist for the foreseeable future and to be compounded by the introduction of yet more new methods, such as steam ablation.

CONCLUSION

Sixty cases of varicose veins of the lower limb have been studied in detail.

Analysis of the data has enabled this study to arrive at the following conclusions:-

- vVaricosity 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 absence of troublesome symptoms, patients do not seek treatment in our country.
- vThe commonest age group of patients with varicose veins is 41 to 60 years.
- vAbout 70% of the patients are male. The male: female ratio is 3:1
- vNo definite conclusion could be drawn from the present series regarding etiology, as the number is small. However, a definite relationship exists between family history, occupation and the incidence of varicose veins.
- vThe involvement of long saphenous system is more common than the short Saphenous system and right is affected more than left limb.
- vClinical examination has got good predictive accuracy. It gives sufficient information to treat the patients in centers where colour Doppler is not available or affordable.
- vThe use of colour Doppler is a valuable supplement to clinical examination. And it can be used as an adjuvant to prevent recurrences and reduce morbidity.
- vSPJ junction is highly variable and should always be marked pre-operatively using Doppler
- vThe outcome of cases of primary varicose veins depends on a thorough and complete clinical examination and duplex scan
- vConservative treatment though relieves symptoms, it cannot be the definitive treatment and it has to be followed by some form of definitive treatment.
- vOperative line of treatment is a primary procedure in the management of varicose veins of lower LSV stripping up to knee and non-stripping of SSV is associated with less morbidity.
- vComplications are negligible if cases are meticulously selected and operated. The present procedures enable the patient to lead almost normal life after surgery and the morbidity rate is very negligible.

- vThough the newer trends in the management of varicose veins are showing good results, they need a long term follow up.

SUMMARY

Background

Varicose veins primarily considered to be a cosmetic problem have been widely mistaken to be medically unimportant and given low priority for treatment. The associated pain, swelling, open ulceration and other morbidities increase cost of its management. The debilitation adds on to the time lost from work and wages.

Aim

To study the aetogenesis, pathology, presentation, complications, and management of varicose veins in the study populations.

METHODS:

The current study followed a prospective observational study design among 60 patients visiting Meenakshi Medical College Hospital and Research Institute with symptoms and signs of varicose veins and clinically diagnosed as having varicose veins. Various presentations and complications and treatments were noted and finally followed up for minimum of 6 months.

Results and conclusion

It is found that varicose veins and their associated symptoms and complications constitute the most common chronic vascular disorders leading to surgical treatment. The incidence is on the rise. It is more common in middle- aged group and in males. Patients presented with spectrum of symptoms and signs, dilated and tortuous veins being more common presentations.

Long saphenous system is the most common venous system affected. Ankle (lower perforator being the most common incompetent perforators. The outcome of cases of primary varicose vein depends on a thorough and complete clinical examination and duplex scan by an experienced radiologist.

Operative line of treatment is a primary procedure in the management of varicose veins of lower Stripping of LSV up to knee and non-stripping of SSV is associated with less morbidity. Accurate assessment reduces the risk of recurrent varicose veins. There must be ample support from the Government so that even the poor will be benefited from the newer modality of treatment of varicose veins.

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