

A prospective clinical study on varicose veins of lowerlimbs and its management in a tertiary care general surgery department.

Dr. Bhavanam Hanuma Srinivas¹, Dr. Gaddala Penchalayya²

^{1,2} Assistant professors.

^{1,2} Department of General surgery, Guntur Medical college, Guntur, Andhra Pradesh.

Abstract:

Background: Varicose veins and their associated symptoms and complications constitute the most common chronic vascular disorder of the lower limb. The term varicose is derived from the Latin word meaning "dilated". Varicose veins is defined as dilated, tortuous and elongated veins in the lower limbs. Varicose veins are a common medical condition present in at least 10% of the general population¹.

Objective: The main objective of this study is to evaluate the demography, aetiology, distribution, pathophysiology and clinical features, the various modes of investigations and management of varicose veins in the lower limbs effectively.

Materials and Methods: A prospective observational study at a single centre with all patients with lowerlimb varicose veins who underwent surgery during a period of September 2015 to September 2017 were included for analysis. Demographic factors like age, gender, aetiology, pre op clinical status, imageological factors like duplex ultrasound, surgical findings and postop complications were studied.

Findings: A total of 98 patients with lowerlimb varicose veins managed surgically were included in this study. Most common age group involved is 21-50 years. Predominantly males (80.61%) are affected in large proportions.

Occupation has a definite role to play as a causative factor. Among 98 cases studied, 48 cases had family history of close relatives, suffering from varicose veins.

Almost all patients had prominent varicosities as common symptom. In the present study, right limb involvement of 36% and the left limb involvement of 60%.

The long saphenous vein was involved in 92% of cases. The majority of the patients 75% have saphenofemoral and perforator incompetence. Majority of patients (70%) have Lower leg and ankle perforators incompetence.

Duplex ultrasound done in all most all the patients. Sapheno-femoral flush ligation and stripping was done in 93% of the patients.. Follow up was available for all patients at 6 months.

Conclusions: Varicosity of the veins of the lower limb is a fairly common clinical entity. Occupation involving prolonged standing was a major contributing factor in 75% of patients. Involvement of Long saphenous vein is noted in majority of patients. Duplex ultrasound is the most sensitive and specific investigation required to diagnose varicose veins. Surgery is the primary modality of the treatment. Most common surgery performed is saphenofemoral flush ligation with stripping. Bisgaard's regimen is effective against healing of venous ulcers.

Keywords: Duplex ultrasound, Saphenofemoral, Varicose vein

Date of Submission: 18-06-2020

Date of Acceptance: 04-07-2020

I. Introduction

Varicose veins of lower limb and their treatment are as old as mankind.

Varicose veins are a common medical condition present in at least 10% of the general population¹.

The symptoms of varicose veins range from asymptomatic varicose veins to more severe complications such as ulceration and bleeding.

Varicose veins may cause morbidity including dermatitis, ankle edema, spontaneous bleeding, superficial thrombophlebitis, lipodermatosclerosis and ulceration. The Doppler ultrasound and duplex imaging has become the mainstay of investigations in the diagnosis of chronic venous insufficiency.²

The treatment options for varicose veins includes conservatively by applying stockings, Bisgaard's regimen and surgically by doing Trendelenburg operation, Stripping, Subfascial ligation of perforators, Laser, Sclerotherapy, Subfascial endoscopic perforator surgery & Radiofrequency ablation. In the recent past, minimally invasive procedures are replacing the more invasive procedures.

II. Materials & Methods

It is a single centre, prospective observational, non randomised study of all patients with varicose veins of lower limbs, who were surgically managed in Department of General surgery, Guntur medical college, Guntur were included in the study. Patient enrolment began in September 2015 and ended in September 2017. **Inclusion**

criteria: 1) Primary varicose veins

2) Symptomatic varicose veins with symptoms of aching, heaviness and cramps.

3) Complications of venous stasis such as pigmentation, dermatitis, ulceration and superficial thrombophlebitis.

4) Large varicosities subject to trauma. 5) Cosmetic concern.

Exclusion Criteria: patients with

1. Dermal flares, reticular veins and telengectasia (C 1 clinical class)

2. Secondary varicose veins

3. Deep vein thrombosis

4. Recurrent varicose veins were not included in the study.

Evaluation: All patients were assessed clinically by using traditional methods. Apart from clinical parameters, the demographic parameters like age, gender, aetiology, genetic factors were also included in the study. Radiological evaluation done by using Duplex ultrasound, colour Doppler.

Following surgical treatment were carried out in our Institute.

1) Trendelenberg's operation

2) Stripping of long Saphenous vein

3) Subfascial or extra facial ligation of perforators.

4) Multiple stab avulsion of long Saphenous vein

5) Saphenopopliteal junction ligation Each case was carefully followed up to evaluate the progress of patient and to note the development of complications, if any and its management. The details of all cases are summarized in the master chart and results of the study have been analyzed in detail.

III. Results:

Study population:

Total of 98 patients were enrolled during the study period (September 2015 to September 2017). The descriptive analysis is provided in Table 1. Maximum number of patients in present study corresponds to between 21 to 50 yrs. Among the patients 80.61% were males.

Occupation has a definite role to play as a causative factor. Varicose veins are common in person, whose occupation demands prolonged standing.

Among 98 cases studied, 48 cases had family history of close relatives, suffering from varicose veins.

Clinical parameters:

Almost all patients (100%) had prominent varicosities as common symptom, associated with other manifestations like pain(53%), oedema (49%), pigmentation(26%), ulcers(10%) etc. In the present study, right limb involvement of 36% and the left limb involvement of 60%. The long saphenous vein was involved in 92% of cases, the second victim being the perforators which was involved in 87% of cases. The short saphenous vein involvement in the present series was 04%. The majority of the patients 75% have saphenofemoral and perforator incompetence. Isolated perforator incompetence is seen only in 3% of patients. 7% of patients have combined saphenofemoral, sapheno-popliteal and perforator incompetence. Majority of patients (70%) have Lower leg and ankle perforators incompetence.

Imageology: Duplex ultrasound, colour Doppler of lowerlimbs venous system done in almost all the cases.

Types of surgery : Table 3 data shows various operative procedures carried out Sapheno-femoral flush ligation and stripping was done in 93% of the patients. Most of the patients in this study (12%) developed wound infection post-operatively.

The duration of hospital stay varied from 2 to 14 days. The mean range of stay is 4 days. No mortality. Out of 98 patients 12 patients had post op wound infection and 8 patients had wound hematoma, 10 patients had sensory neuritis, 4 patients had lymphorrhoea, 3 patients had wound dehiscence.

IV. Discussion

Varicosity of lower limb is a common clinical problem. Varicosities often start early in life but assume a silent course for variable length of time, before they develop complications due to venous hypertension. Numerous studies in the literature shown how various factors like age, gender, etiology, family history, clinical factors, imageological factors, various surgical procedures etc. had influence on the outcomes.

Demography & outcome. Sex distribution: Though the western study show a clear female predominance (Male : Female = 1:5),³ the present study showed Male:Female ratio of 4.1:1. It is because, females do not undergo occupational hazards of that of males, like prolonged standing, physical stress involving increased intra abdominal pressure. And these females sought treatment for symptoms due to varicosities rather than cosmetic reason. Most Indian women cover their limbs with saree and hence they are not much bothered about the appearance of dilated veins. Some other studies like SelçukKapisız N et.al.⁴ and Lee AJ, Evans CJ et.al⁵ also explains that female preponderance is more than males.

Age distribution: The age distribution is characteristically between 20+/- 50 years. This group includes 75% of cases. The youngest patient is of the age of 16 years and the oldest at 70 years.

Occupation: Occupation has a definite role to play as a causative factor. Varicose veins are common in person, whose occupation demands prolonged standing. It is the part of the penalty for adopting an erect posture. In present study varicose veins are most common in Agricultural workers(25%) followed by manual labourers (17%) and drivers(6%).

Family history: Among 98 cases studied, 48 cases had family history of close relatives, suffering from varicose veins. The occurrence of varicose veins in several members of the family suggests that hereditary factors may be an important cause of varicosity. In the present study 48.97% of patients had family history of varicose veins which are in consistent with other studies.

Works of many others like, Basle study, studies of Hirai, Mekay and Colleagues, Prerovsky and study by Belcaro agree for positive family history in patients of varicose veins, but in all these studies none of the relatives were assessed clinically, importance was given only to the history given by the patient.⁶

Clinical parameters: Almost all the patients (100%) had prominent veins as the presenting complaint. Pain is present in 53 %, edema is present in 49%, skin changes seen in 26% and venous ulceration seen in 10%. Cosmetic appearance was the commonest complaint which favours with the other comparative studies. comparison study^{7,8} depicted in table 2. CEAP classification used for severity of varicose veins. Majority of patients came to hospital to take treatment for complication of varicose veins (61%). Only 39% of patients had only prominent veins , which belong to class II. In Rao SV et al study, 45% of patients, present with clinical grading (C2) followed by active ulceration and lipodermatosclerosis (C6) in 40%.⁵⁴ In Mishra S et al study, 20 patients are with C2, 15 cases are with C3, 15 cases are with C4 and 10 cases are with C5.⁹ In Seidel AC et al study, Majority of the limbs (96%) belonged to chronic venous disease classes C1 and C2.¹⁰ In Fiebig A et al study, 83.4% of patients are belong to class C3 to C6.¹¹ All these studies also indicates that most people come to clinic after developing of complications due to varicose veins.

Limb involvement: In the present study right limb is involved in 36%, left limb is involved in 60%. Bilateral involvement is seen in 4% of patients. The exact cause is unknown. This is probably because that the loaded left colon constantly compresses the left iliac veins, the left common iliac artery crossing over the left common iliac vein and the longer course traversed by the left iliac veins. This favourable compares with the study conducted by A.H.M.Dur, A.J.C. Mackaay et.al.¹²

Venous system involvement: Long saphenous vein is involved in 89% of patients of patients. The second commonest being perforators which were involved in 87%. Short saphenous vein is involved in about 04%. Majority of the patients has combined saphenofemoral and perforator involvement. Similar results were observed in Al-Mulhim.et.al.¹³ In Heyerdale WW et al study, great saphenous vein and short saphenous vein were affected in the ratio 3:1.¹⁴

Site Of Incompetence: Out of 98 patients , all patients have incompetence of superficial veins. Majority of patients 75% have sapheno-femoral and perforator incompetence. Isolated perforator incompetence is seen only in 3% of patients. 7% patients have combined sapheno-femoral, sapheno-popliteal and perforator incompetence.

sites of perforator incompetence: 70% of patients have lower leg and ankle perforator incompetence. Patients who had lower leg and ankle perforator incompetence had one or the other complications of varicose veins. Isolated above knee perforators is seen in four patients only and below knee perforator incompetence seen in 27%. In Liu CH,Wu CJ et al study, Mid thigh perforators are involved in 17.6%, upper calf perforators are involved in 52.6% and lower calf perforators are involved in 29.8%.¹⁵ In this study below ankle perforator involvement is high. In Delis KT et al study, In Chronic vein Insufficiency, incompetent perforator veins are located predominately in the medial aspect of the lower extremity, more often in the middle third of the calf, followed by the lower calf and middle thigh.¹⁶

Investigations: Apart from routine investigations all patients underwent duplex ultrasound of the venous system of lower limbs. This investigation was required to locate perforator incompetence, to rule out deep vein thrombosis, to mark the site of perforator incompetence before surgery.

Treatment : Treatment of cases was depend up on the individual cases, And in patients with venous ulcers Bisgaard's method of treatment was followed till the ulcer heals and then patient was subjected to further definitive management. Incompetent saphenofemoral valve is treated by Trendelenberg operation with flush

ligation of saphenofemoral junction and stripping of long saphenous vein. In cases where passing the stripper was difficult due to excessive tortuosity, Multiple Stab Avulsion (MSA) was done. Saphenopopliteal incompetence was tackled by saphenopopliteal junction ligation. Incompetence perforators were managed either by subfascial ligation or extra fascial ligation. These procedures were done individually or in combination with other procedures depending on the venous system involved. In the present study sapheno-femoral flush ligation + stripping (SFFL+STRP) was performed in 10% of patients, Sapheno-femoral flush ligation+ multiple stab avulsion (SFFL+MSA) was performed in 4% of patients, sapheno-femoral flush ligation+ stripping+subfascial ligation (SFFL+STRP+SFL) was performed in 61%, saphenofemoral flush ligation + stripping+ subfascial ligation+ split skin grafting (SFFL+STRP+SFL+SSG) was performed in 10% of patients, saphenofemoral flush ligation + stripping + saphenopopliteal ligation +subfascial ligation (SFFL+STRP+SPL+SFL) was done in 8% of patients, saphenopopliteal ligation (SPL) alone is done in 2% of patients, saphenopopliteal ligation+ subfascial ligation (SPL+SFL) was done in 2% of patients, subfascial ligation (SFL) alone is done in 3% of patients. Present study showed that SF flush ligation combined with multiple stab avulsion or perforator ligation offered very good results same as SK Sahu et al⁶²

In Hobbs JT et al study, which is a comparative study between surgery and sclerotherapy, also states that doing surgery for saphenous system involvement with proximal involvement is more successful. "Varicose veins are a common problem, and yet there is divergent opinion as to whether surgery or sclerotherapy is the preferred method of treatment. After establishing a reliable injection technique, the method was compared with standard surgical procedures in a random trial. The results showed that after one year 82% of unselected patients were cured by injection, but after six years the cure rate was only 7%. The surgical result was not as good at one year, but much better than injection after six years. When the results were considered for three distinct clinical groups, the analysis showed that the best primary treatment for dilated superficial veins and for incompetent perforating veins in the lower part of the legs was injection-compression. However, surgery was much more successful and long-lasting when there was involvement of the saphenous systems with proximal incompetence."¹⁸

complications: Patients were observed for complications both intraoperatively and postoperatively. Wound infection was seen in 12% of patients, Hematoma was observed in 8%, saphenous neuritis was observed in 10% of patients, wound dehiscence was observed in 3% of patients and 4% patients had lymphorrhea from the inguinal wound. None of our patients had femoral vein injury, femoral artery injury, deep vein thrombosis or pulmonary embolism.

Limitations of study: - Present study has the following limitations. The major limitations of the present study were a moderate sample size, with non-uniformity in timing of surgery.

V. Conclusions

The present study shows that the prevalence of varicose veins of lower limbs is more in people of young and upper middle age group. Family history of varicose veins of lower limb is an important risk factor in the development of lower limb varicose veins. Occupations involving prolonged standing is an important predisposing factor in the development of lower limb varicose veins. Varicose veins mainly involves the Long saphenous system due to saphenofemoral and perforator incompetence. Duplex ultrasonography is the investigation of choice. Trendelenburg operation with stripping is very effective in the treatment of varicose veins.

References

- [1]. Everett .Y.Lam, Mary E Giswold and Gregory L Moneta. "Venous and lymphatic disease" Schwartz's principles of surgery. Chapter 23, 8th edition, 2005;808-833
- [2]. Salaman RA, Salaman JH, Singh S. Improving the preoperative assessment of varicose veins. Br J Surg. 1997 Dec;84(12):1748.
- [3]. Chang CJ, Chua JJ. Endovenous laser photocoagulation (EVLP) for varicose veins. Lasers Surg Med. 2002;31(4):257-62.
- [4]. Selçuk Kapisız N, UnzünKulaoglu T, Fen T, Kapisız HF. Potential risk factors for varicose veins with superficial venous reflux. International journal of vascular medicine. 2014 Sep 11;2014.
- [5]. Lee AJ, Evans CJ, Allan PL, Ruckley CV, Fowkes FG. Lifestyle factors and the risk of varicose veins: Edinburgh Vein Study. Journal of clinicaledemiology. 2003 Feb 28;56(2):171-9.
- [6]. Mirji P, Emmi S, Joshi CJ. Study of clinical features and management of varicose veins of lower limb. J. Clin. Diagn. Res. 2011;5:1416-20.
- [7]. Rudofsky G. [Epidemiology and pathophysiology of primary varicose veins]. Langenbecks Arch Chir. 1988; Suppl 2:139-44
- [8]. O'Shaughnessy et al "Surgery in the treatment of varicose veins" Ir Med J 1989 June; 82(2): 54-55.
- [9]. Mishra S, Ali I, Singh G. A study of epidemiological factors and clinical profile of primary varicose veins. Medical Journal of Dr. DY Patil University. 2016 Sep 1;9(5):617.
- [10]. Seidel AC, Miranda F, Juliano Y, Novo NF, Dos Santos JH, De Souza DF. Prevalence of varicose veins and venous anatomy in patients without truncal saphenous reflux. European journal of vascular and endovascular surgery. 2004 Oct 31;28(4):387-90.
- [11]. Fiebig A, Krusche P, Wolf A, Krawczak M, Timm B, Nikolaus S, Frings N, Schreiber S. Heritability of chronic venous disease. Human genetics. 2010 Jun 1;127(6):669-74.
- [12]. Dur AH, Mackaay AJ et al. Duplex assessment of clinically diagnosed venous insufficiency. Br J Surg. 1992 Jun;79:155-61

- [13]. Al-Mulhim AS, El-Hoseiny H, Al-Mulhim FM, Bayameen O, Sami MM, Abdulaziz K et al. Surgical correction of main stem reflux in the superficial venous system: does it improve the blood flow of incompetent perforating veins? World J Surg. 2003 Jul;27(7):793-6.
- [14]. Heyerdale WW, Stalker LK. Management of varicose veins of the lower extremities. Annals of surgery. 1941 Dec;114(6):1042.
- [15]. Liu CH, Wu CJ, Yu CY, Chang WC, Huang GS. Evaluation of Lower Limb Varicose Vein by Ultrasonic Venous Duplex Examination. Journal of Medical Ultrasound. 2013 Jun 30;21(2):76-80.
- [16]. Delis KT, Ibegbuna V, Nicolaides AN, Lauro A, Hafez H. Prevalence and distribution of incompetent perforating veins in chronic venous insufficiency. Journal of vascular surgery. 1998 Nov 30;28(5):815-25.
- [17]. S.K. Sahu, S. Bhushan, P.K. Sachan: Clinico- Anatomical and Radiological Study of Varicose Veins of Lower Limb and Their Management Outcomes. The Internet Journal of Surgery. 2012 Volume 28 Number 2.
- [18]. Hobbs JT. Surgery and sclerotherapy in the treatment of varicose veins: a random trial. Archives of surgery. 1974 Dec 1;109(6):793-6.

Table 1: Descriptive analysis of study participants (N=50)

Parameter	Frequency	Percent
I. Age group		
20 and below	4	4
21-50	73	74.5
Above 50	21	21.5
II. Gender		
Female	19	19.38
Male	79	80.61
III. Aetiology		
Agriculture	24	25
Manual labour	16	17
drivers	6	6
Others	52	52
IV. Clinical presentation		
Prominent veins	98	84
Prominent veins+pain	52	24
Prominent veins+oedema	48	56
Pigmentation+lipodermatosclerosis	25	8
Venous ulceration	10	

Table- 2 Comparision of Clinical Manifestations

Symptoms	Present study %	Rudofsky G. Langenbecks Arch Chir ⁷	O' Shaughnessy M et AL ⁸
Prominent veins	100	90	92
Prominent veins and pain	53	30	54
Prominent veins and Edema	49	52	62
Pigmentation and lipodermatosclerosis	26	13	22
Venous ulceration	10	9	14
Previous history of DVT	-	-	5

3. SURGICAL PROCEDURES PERFORMED

Surgical procedures	Limb	Percentage
SFFL+STRP	11	10%
SFFL+MSA	4	4%
SFFL+STRP+SFL	62	61%
SFFL+STRP+SFL+SSG	10	10%
SFFL+STRP+SPL+SFL	8	8%
SPL	2	2%
SPL+SFL	2	2%
SFL	3	3%

Dr. Bhavanam Hanuma Srinivas, et. al. "A prospective clinical study on varicose veins of lowerlimbs and its management in a tertiary care general surgery department." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(7), 2020, pp. 16-21.