

## Research Article

# Prospective clinical study of surgical management of varicose veins of lower limb and its complications

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## ABSTRACT

**Background:** Varicose veins of the lower extremities are the most common peripheral vascular disease and their treatment is as old as mankind. This prospective clinical study of surgical management of varicose vein was conducted to study the age, sex and occupational distribution of varicose veins of lower limb. Evaluations of clinical features and surgical methods of treatments that were in practice in the management of varicose veins in terms of recurrence and symptoms improvement were also studied.

**Methods:** Two years prospective study was conducted in our institution from May 2007 to April 2009. During this period 62 cases of varicose veins of lower limbs were admitted to our hospital of which 50 cases were selected and were studied in detail. After thorough clinical examination and relevant investigation they are all subjected to surgical management.

**Results:** Out of 50 cases studied, 21 (42%) had only long saphenous vein involvement, 7 (14%) had short saphenous vein involvement and in 5 (10%) cases both short and long saphenous system were involved. In addition to long saphenous vein involvement, incompetent perforators were present in 17 (34%) cases. Among them prominent veins and pain were the main complain in 38 (78%) patients. Itching and pigmentation were present in 4 (8%) patients. Ankle edema was present in 6 (12%) patients. Pain and ulceration of lower leg were present in 2 (4%) patients. After clinical assessment appropriate surgical procedures were followed for each of patients. These cases were followed for 3 year durations. Out of 50 patients 7 (14%) patients had recurrence of varicose vein. 7 (14%) patient complained of recurrence of pain after 2 years of surgery but no appearance of varicose vein. One patient (2%) complained of persistence of pigmentation after surgery. 2 (4%) patients complained of persistence of ankle edema and there was complete healing of ulcer which was present earlier.

**Conclusions:** Commonest age group of varicose vein of lower limb was 20 to 40 years. Definite relationship exists between the occupation and the incidence of varicose veins. The patients were in the occupation which required standing for long time had the higher chances of varicose vein. Severity of the symptoms is not proportional to the duration of varicose veins. The involvement of long saphenous vein is more common than the short saphenous vein. Since our study shows very low percentage of recurrence and symptoms related to varicose vein the surgical line of treatment is an ideal treatment for varicose vein. For incompetent perforators, sub-fascial ligation appears to be a better method of treatment than extra fascial ligation. Because in the former all the perforators could be visualized and dealt with, while in the latter there were chances of missing one or two perforators. If cases are selected properly with good operative technique the complications are negligible.

**Keywords:** Long saphenous vein, Stripping of varicose vein, Varicose ulcer

## INTRODUCTION

Varicose veins of the lower limb and their treatment is as old as mankind. Varicose veins are one of the commonest ailments of people, probably one in five women and one in fifteen men over the age of forty five are affected. During the past four decades considerable knowledge has been gained regarding anatomy, pathophysiology and clinical management of varicose veins of the lower extremities. The most important of these studies has been on the behavior of venous pressure of superficial and deep veins of lower limbs in erect position, during rest and exercise and on the function of muscular venous pump. The numbers of patients coming to the hospital for the treatments of varicose vein are much less than the real incidence. The reason could be that the patients did not come to hospital unless they develop some complications like pain, eczema and ulcerations. Varicose veins of the lower limb are the most common peripheral vascular disease. Varicose vein surgery produces high percentage of good results if meticulous surgery is followed.

### Aims and Objectives

This prospective clinical study of surgical management of varicose vein was conducted

1. To study the age, sex and occupational distribution of varicose veins of lower limb.
2. Evaluations of clinical features and surgical methods of treatments that were in practice in the management of varicose veins in terms of recurrence and symptoms improvement were also studied.

## METHODS

### Source of data

Patients who were having varicose veins attending our hospital formed the subject of the study. Our sample size was 50 patients. All patients with varicose vein of any age attending our hospital during the period from May 2007 to April 2009 were included in the study. Patient with history of acute or chronic deep vein thrombosis were excluded from the study.

### Methods of collection of the data

In out patient department a detailed history and thorough physical examination of the patients having varicose vein were carried out and entered in the proforma. Relevant laboratory investigations were carried out. All patients were subjected to Doppler ultrasound of both lower limbs for confirmation of diagnosis and to rule out deep vein thrombosis. The patient was informed about the procedure and informed consent was obtained from the patient before subjecting them to include in the study. The complication of long standing varicose vein such as edema, ulceration and dermatitis were attended before the operative procedure.

### Analysis of the data

These 50 cases of varicose vein constituted 0.5% of the total surgical admissions in our hospital during that period. The age of the patients studied varied from 15 to 70 years. Most patients were in the age group of 18 to 40 years. There were 41 males and 9 females.

**Table 1: Age and sex incidence.**

Age in years	Male	Female	Total
15-20	9 (18%)	0	9 (18%)
21-30	12 (24%)	4 (8%)	16 (32%)
31-40	14 (28%)	3 (6%)	17 (34%)
41-50	3 (6%)	1 (2%)	4 (8%)
51-60	2 (4%)	0	2 (4%)
61-70	1 (2%)	1 (2%)	2 (4%)
Total	41 (82%)	9 (18%)	50

Among 50 patients studied, 44 patients exhibit a definite history of standing for long duration. In that 38 were agricultural and related workers and 6 were businessmen who required standing for long duration during their work. Others are sedentary workers. Among 50 patients, only 2 gave the family history of the same problem. So the incidence of family history of varicose vein in this study were very low (4%). In this series, 26 patients had varicosity in the left lower limb and 21 had varicosity in the right lower limb and the remaining 3 had bilateral limb involvement.

**Table 2: Limb involvement.**

Leg involved	No. of patients (50)	Percentage
Left leg	26	52%
Right leg	21	42%
Bilateral	3	6%

The average duration of symptoms in this study was 4 years. The longest duration of symptom was 6 years and shortest was 6 months. The predominant symptom in majority of cases was prominent veins and dull aching pain.

**Table 3: Presentation of symptoms.**

Presentation of symptoms	No. of cases	Percentage
Prominent vein and pain	38	78%
Itching and pigmentation	4	8%
Ankle edema	6	12%
Pain and ulceration	2	4%
Total	50	100

## RESULTS

The following table explains the type of venous system involved.

**Table 4: Type of venous system involved.**

Type	No. of cases	Percentage
1. Long saphenous system	21	42%
2. Long saphenous + incompetent perforators	17	34%
3. Short saphenous system	07	14%
4. Both long and short saphenous veins involvement	05	10%
Total	50	100

Conservative treatment was followed preoperatively to improve the general condition of the patients and to make them fit for surgery. Post-operative elastocrepe bandage was applied to all the cases to prevent haematoma formation after stripping of veins and advised to continue it for 2 more months after they were discharged from the hospital. The following surgical procedures were adopted.

**Table 5: Surgical procedure performed.**

No.	Surgical procedure	No. of patients
1.	Saphenofemoral flush ligation and ligation of anatomical constant tributaries at their termination along with stripping of long saphenous vein by using intraluminal stripper.	21 (42%)
2.	Perforators were identified sub-fascially and ligated in addition to the above procedure.	17 (34%)
3.	Saphenofemoral and saphenopoplital flush ligation with stripping of both long and short saphenous vein.	3 (6%)
4.	The saphenofemoral, saphenopoplital flush ligation with stripping of long and short saphenous vein and sub-fascial ligation and excision of incompetent perforators were performed.	2 (4%)
5.	Saphenopoplital flush ligation with stripping of short saphenous was done after ligating the tributaries.	6 (12%)
6.	Saphenopoplital flush ligation with sub-fascial ligation of perforators.	1 (2%)
	Total	50

In this series, stripping of long saphenous vein was done in 38 cases and stripping of short saphenous vein was done in 6 cases and stripping of both veins was done in 5 cases. Out of these, 3 patients complained of sensory impairment in cutaneous nerve distribution of long saphenous nerve and 1 patient complained of sensory impairment of distribution of sural nerve. The low incidence of sensory impairment in the present series may

be because of better surgical technique and avoiding stripping of vein in distal third of leg where the nerve and vein travel very closely. The low incidence of sensory impairment is also due to the fact that most of our patients were village and agricultural workers who may not be bothered to notice slight impairment of sensation. Haematoma formation was noticed in 3 cases after stripping and it was resolved in about a month time. 6 cases had post operative wound infection and they were treated with appropriate antibiotics. There was no incidence of deep vein thrombosis.

These cases were followed for 3 year durations. Out of 50 patients 7 (14%) patients had recurrence of varicose vein. 7 (14%) patient complained of recurrence of pain after 2 years of surgery but no appearance of varicose vein. One patient (2%) complained of persistence of pigmentation after surgery. 2 (4%) patients complained of persistence of ankle edema and there was complete healing of ulcer which was present earlier.

## DISCUSSION

Varicose veins of the lower limb are the most common peripheral vascular disease of mankind. The term varicose is derived from Latin word 'varicose', which means dilated. Varicose vein by definition means dilated, elongated and tortuous vein. In developed countries patients turn up to treatment for cosmetic reasons, however in our Indian scenario it is the complications and not the cosmetic reasons that bring the patient to the doctor. The age distributions of varicose vein shows majority of patients are between the age of 20 to 40 years which correlates well with study conducted by Promod Mirji et al<sup>1</sup> and Lateef.<sup>2</sup> Among 50 patients studied, 44 patients exhibit a definite history of standing for long duration. In that 38 were agricultural and related workers and 6 were businessmen who required standing for long duration during their work. This suggests occupation has a definite role as a causative or a contributing factor. The occurrence of varicose vein in members of the same family suggests that the hereditary factors may play a role. In our series among 50 patients, only 2 gave the family history of the same problem. So the incidence of family history of varicose vein in this study were very low (4%). The most common symptom was dilated veins with dull aching pain which occurred alone or in combination of limb edema, pigmentation or ulceration. It is evident from this series that the cosmetic factor is not the thing that prompts the Indian patient to seek treatment as do those in the west.<sup>1, 3</sup>

In this series, left side involvement was present in 26 (52%) cases. Higher incidence of varicosity is in conformity with some authors who think that the varicose veins are more common in the left limb probably due to the venous drainage of the left leg follows a more tortuous course through the pelvis, with left common iliac vein traversed by the right common iliac artery and also due to presence of loaded sigmoid colon which exerts constant pressure on the vein in the pelvic cavity.<sup>3</sup> In 21 (42%) patients right leg was involved and 3 (6%) cases

bilateral involvement was present. The present study revealed long saphenous vein involvement that was 43 patients (86%) with or without short saphenous system and perforators incompetence was most common. This was some what equivalent to other studies.<sup>1,4</sup> All patients in our study underwent Doppler ultrasound of both the legs for confirmation of the diagnosis and to rule out presence of deep vein thrombosis which we felt must be before proceeding with surgical management.<sup>5</sup>

The total duration of hospital stay was 10 days in our study. Some of the western studies followed the basis of day care in varicose vein surgery and found that it is safe, feasible and more cost effective.<sup>6,7</sup>

In our series, no cases gave definite history of deep vein thrombosis and also no case had superficial thrombophlebitis. This finding was in conformity with some authors that the superficial thrombophlebitis as a cause of varicose veins is very rare and most probably phlebotic changes occur in the veins which are already varicosed.<sup>8</sup> The complications of varicose vein surgery are as such very rare. In our study, we noticed haematoma formation in 3 cases, which resolved by conservative treatment. 6 patients had postoperative wound infection, which was treated with antibiotics. There was no incidence of deep vein thrombosis postoperatively. Out of 50 cases, 3 patients complained of sensory impairment in cutaneous nerve distribution of long saphenous nerve and 1 patient complained of sensory impairment of distribution of sural nerve. The low incidence of sensory impairment in the present series may be because of better surgical technique and avoiding stripping of vein below midcalf where the nerve and vein travel very closely.<sup>9</sup>

In addition to surgery, sclerotherapy, foam therapy, laser endoluminal ablation and radiofrequency endoluminal ablation are the other available treatments for varicose vein. In one meta-analysis of treatment of varicose vein mentioned these treatments appear to be safe with rare side effects. Surgery is the only treatment with long term effectiveness data. The other less invasive treatments are associated with shorter disability and less pain, but only short term effectiveness data.<sup>10</sup>

## CONCLUSION

Commonest age group of varicose vein of lower limb was 20 to 40 years. Definite relationships exist between the occupation and the incidence of varicose veins. The patients were in the occupation which required standing for long time had the higher of varicose vein. Severity of the

symptoms is not proportional to the duration of varicose veins. The involvement of long saphenous vein is more common than the short saphenous vein. Since our study shows very low percentage of recurrence and symptoms related to varicose vein the surgical line of treatment is an ideal treatment for varicose vein. For incompetent perforators, sub-fascial ligation appears to be a better method of treatment than extra fascial ligation. Because in the former all the perforators could be visualized and dealt with, while in the latter there were chances of missing one or two perforators. If cases are selected properly with good operative technique the complications are negligible. These surgical procedure followed enable the patients to lead almost a normal life.

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