Section: General Surgery

Original Research Article

A CLINICAL STUDY ON OUTCOME OF SURGICAL MANAGEMENT OF LOWER LIMB VARICOSE VEIN

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ABSTRACT

Background: Varicose veins defined as dilated, tortuous, subcutaneous veins ≥3 mm in diameter, measured in the upright position with demonstrable reflux. Varicose veins is a common clinical condition in India with huge working class population affecting the lower limbs. Though the patients from urban areas comes for a cosmetic problem, but the patients from the rural areas present with its complications giving rise to significant morbidity if not treated in time. Different options are available for surgical management. The aim of the present study was to study the clinical profile, risk factors and their association, different types of surgical procedures employed and complications associated with varicose veins. **Materials and Methods:** A six months observational study was carried out after ethical committee approval. The study was conducted in the Department of general surgery, Trichy SRM medical college hospital and research centre tertiary care academic hospital from November 2024 to April 2025 and 40 cases with primary varicose veins were enrolled. The clinical presentation of varicose veins were studied. Mean age and gender preponderance were calculated. Cases fulfilling the inclusion criteria were clinically examined and duplex ultrasound color Doppler was performed for diagnosing the varicose veins, findings of site of incompetence was noted and accordingly appropriate treatment in the form of conservative, surgical or endo venous laser ablation was given. And the Complications following the procedures were studied. The results were tabulated and analyzed. **Result:** A total of 40 cases with 65.45% males and 34.55% females with mean age of 40.24 years and majority (40%) were in 41 to 50 years, long saphenous vein was involved in 52.5% of cases. Short saphenous involved in 27.5% and both LSV & SSV involvement in 20% cases, 76% had dilated veins, perforator incompetence was noted below the knee in 30% of cases, Duplex Ultrasound of the venous system proved to be a crucial and clinching investigation and the Venous Doppler had accuracy of 92.59% in detecting sapheno-femoral and perforator incompetence. Sapheno-femoral flush ligation with stripping was the most commonly performed surgery (46.7%), with addition of Sub fascial ligation in a few cases. Results of endo venous laser ablation are similar to surgery but with less morbidity. **Conclusion:** This study revealed the varicose vein of lower limb is prevalence in active phase of life with male preponderance. Majority of the patients had great saphenous vein incompetency and the complications are more when both great saphenous and perforator systems are involved. Venous Doppler is the investigation of choice as it has high accuracy. Surgical management with stripping of LSV trunk of incompetence with incompetent perforator ligation appears to be best option for lower limb varicose veins under our settings.

INTRODUCTION

Varicose veins is defined as dilated, tortuous and elongated subcutaneous veins ≥3 mm in diameter, measured in the upright position with demonstrable reflux. It's a common medical condition present in at least 10% of the general population but in India it affects 5% of the population. Varicose veins and their

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associated symptoms, complications constitute one of the most common chronic vascular disorders of the lower limb. The morbidity of venous diseases places a substantial burden on the community health care and results in expenditure of large sums on daily management of this problem.[1,2]

The developments in diagnosis and new management modalities gained attention recently. Various predisposing factors have been identified in development of varicose veins which include pregnancy, prolonged standing, obesity, old age, intra-abdominal pressure and heredity also identified as a predominant risk factor in many published studies. The symptoms of varicose veins range from asymptomatic varicose veins to more severe complications such as ulceration and bleeding. Varicose veins may cause significant morbidity including dermatitis, ankle, spontaneous bleeding, superficial thrombophlebitis, lipodermatosclerosis (LDS) and ulceration.[3,4]

The mechanism in occurrence of varicose veins is development of defects in the valves or walls of the superficial venous system or perforating veins. Pathophysiology involves in the venous system from the hemodynamic point of view and the consequences of valvular dysfunction in superficial, deep, and perforating veins have confirmed in causation of varicose veins and skin trophic changes among the chronic cases of varicose veins.[5]

Prehistoric diagnosis and treatment of varicose veins by many phlebologists including many bandaging techniques, ligation and stripping of veins, but Here the attention was mainly towards the mechanical effects of the varicosity rather than the basic cause.[6]

Now the inclusion of duplex imaging and Doppler ultrasound has become the mainstay of investigations in diagnosis of chronic venous insufficiency disorders.[7]

Knowledge has been gained the anatomy of the venous system of the leg, the physiological mechanism of venous return to the heart against gravity and pathology of the disorder, varicose veins are treated by conservative techniques of elasto-crepe bandaging, sclerotherapy or by surgery.[8]

In developing countries like India, where most of the general population cannot afford expensive treatments, surgery remained the most common mode of interventional treatment.[9]

The surgical treatment options for varicose veins includes Trendelenburg operation, stripping, subfascial ligation of perforators, sclerotherapy, subfascial endoscopic perforator surgery, laser, and radio-frequency ablation. In the recent past, minimally invasive procedures are the recent advance in the invasive procedures.[10]

The search for effective means of diagnosis and treatment and prevention and management with reduction in development of postoperative complications continues.[11,12]

The aim of this study is to study the clinical profile, risk factors and their association, different types of surgical procedures employed and complications and its outcome associated with varicose veins.

Aim and Objectives:

- This study will identify the better outcome associated with different types of surgical procedures employed to the patients of lower limb varicose vein.
- Primary Objective:
  - To study the various modalities of surgical management and its outcome will be compared and analyzed.
  - To study the risk factors which influence the outcome.

Secondary Objective:

- Demographic study.
- Complications.

MATERIALS AND METHODS

Source of Data: A prospective observational study was conducted, this study includes all patients admitted with lower limb varicose veins at the Department of general surgery, Trichy SRM medical college hospital and research centre from November 2024 to April 2025.

Study protocol was clearly explained and a written informed consent was obtained from all the participants of the study.

Sample size: Total number of patients were 40. All the patients admitted to the hospital were evaluated by taking detailed history, clinical examination and with relevant investigations. The findings were recorded in the data collection proforma.

Inclusion Criteria:

- All patients with primary varicose veins of the lower limb due to superficial and perforator incompetence.
- Patients of primary varicose veins with complications like:
  - Thrombophlebitis
  - Skin changes (lipodermatosclerosis, eczema and Pigmentation)
  - Ulceration.

Exclusion criteria:

- Patients with Deep vein thrombosis.
- Secondary varicose veins
- Recurrent varicose veins
- Varicose veins other than lower limbs.

Investigations:

Non-specific tests:

- Complete Blood Count
- RBS, Blood Urea, Serum Creatinine, Serum Electrolytes
- HIV, HBsAg
- ECG, Chest X-ray

Specific investigations:

Venous Doppler

By performing duplex ultrasound color Doppler and the site of incompetence was noted. Brodie Trendelenburg test, multiple tourniquet test and

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Perthe's clinical tests were performed on all the cases in the study.

The comparison of saphenofemoral junction and perforators of venous Doppler and clinical tests was compared calculating accuracy between them.

Modified Perthe's test was done to rule out deep vein thrombosis. Multiple tourniquet test is done to identify incompetence at various levels. Abdominal examination to rule out causes of secondary varicose veins.

CEAP classification: Clinico etiologic anatomic pathological classification [Table 1] is used to classify patients according to the signs and the patients were examined in standing position along the whole length of the long saphenous and short saphenous systems.

Treatment: Conservative treatment was given in patients who had no saphenofemoral or perforator incompetence with elastic compression stockings. In patients with venous ulcers, Bisgaard's method of treatment was given initially and then the patient was subjected to further definitive treatment.

Surgical Treatment: Following surgical treatment were performed in our hospital [Table 6]

- Trendelenburg's operation
- Striping of long Saphenous vein
- Subfascial facial ligation of perforators.
- Multiple stab avulsion of long saphenous vein
- Saphenopopliteal junction ligation

Patients were followed up after a period 1 month to check for SSI, after 3 months for the healing of ulcer and symptomatic relief and after 6 months to detect the recurrence of varicosities.

RESULTS

Data Analysis: In this prospective study, a total of 40 cases who fulfilled the inclusion criteria and consented for the study were enrolled. Male predominance with 27 cases (67.5%) and females with 13 cases (32.5%) were observed. With the distribution of age, 40% (16 out of 40) of cases were in between 41 to 50 years, 27.5% (11 out of 40) between 51 to 60 years, 12.5% (5 out of 40) above 60 years, 15% (6 out of 40) between 31 to 40 years and 7.5% (3 out of 40) in between 21-30 years. The range of age distribution of the cases in the study was 24 to 74 years [Table 2].

Varicosities were observed in right limb in 58% of cases, 23% in left and bilateral in 12% of cases, and 51.25% of cases were having an occupation with long standing. 55% of the cases were smokers and 47.5% were alcoholics. The long saphenous vein was involved in 52.5% of all cases, short saphenous in 27.5% and both in 20% of cases [Table 3].

Signs and symptoms: The predominant symptom in majority of the cases was pain in 52.5% of cases followed by heaviness in 48% of cases. Dilated veins were observed in 85% of cases, skin changes like pigmentation, dermatitis etc in 47.5%, edema of the affected limb in 27.5% and ulcerations in 25% of the cases [Table 4].

Wound infection was the common postoperative complication in our study with 6 cases and other minor were hematoma in 3 cases, wound dehiscence in 2 cases and skin necrosis one case [Table 7].

Table 1: Distribution of patients according CEAP classification.

CEAP	No of patients (%)
C2	22 (55)
C3	3 (7.5)
C4	4 (10)
C5	0
C6	11 (27.5)
Total	40

Table 2: Age distribution of cases in the study.

Age distribution (in years)	No	%
10-20	0	0
21-30	3	7.5
31-40	6	15
41-50	16	40
51-60	10	25
>60	5	12.5

Table 3: Risk factors of the cases in the study.

Risk Factors	No	%
Family history	12	30
Agricultural workers	5	12.5
Sedentary activity	23	57.5
Smoking	22	55

Table 4: Signs and symptoms of cases.

Signs and symptoms	No	%
Pain	21	52.5
Dilated veins	34	85
Edema of limb	11	27.5

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Ulcerations	10	25
Skin changes (pigmentation etc)	19	47.5

Table 5: Distribution of venous system and site of perforator incompetence among the cases.

Variable	No	%
Venous system involved		
Long saphenous system	19	47.5
Long saphenous + incompetent perforators	10	25
Short saphenous system	5	12.5
Both	6	15
Perforator incompetence		
Thigh	8	20
Below knee	12	30
Above ankle	11	27.5
Unnamed	3	7.5

Table 6: Surgical procedures performed among the cases in the study

Surgical procedures performed	No	%
SFFL+ stripping	17	42.5
SFFL+ ligation+ multiple avulsion	5	12.5
SFFL+ stripping+ subfascial ligation	11	27.5
SPL	3	7.5
SPL+ stripping	2	5
Multiple stab avulsion	2	5

Table 7: Early post-operative complications.

Complications	No. of Patients	Percent
Wound infection	6	15%
Hematoma	3	7.5%
Seroma	4	10%
Skin necrosis	1	2.5%
Saphenous neuritis	0	-
Femoral vein injury	0	-
Deep vein thrombosis	0	-
Pulmonary embolism	0	-

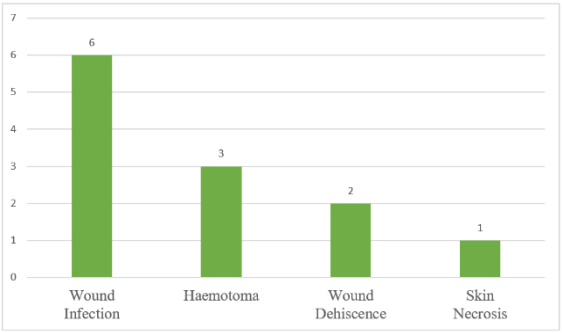

Figure 1: Complications of surgery among the cases in the study.

DISCUSSION

Varicose vein is one of the most common clinical condition encountered by the surgeons in regular clinical practice. This condition is not associated with mortality but with high morbidity and associated complications due to development of venous hypertension.

A total of 40 cases with 65.45% males and 34.55% females with mean age of 40.24 years and majority (40%) were in 41 to 50 years, long saphenous vein was involved in 52.5% of cases. Short saphenous involved in 27.5% and both LSV & SSV involvement in 20% cases, 76% had dilated veins, perforator incompetence was noted below the knee in 30% of cases were observed [Table 5].

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CONCLUSION

In this study, varicose veins are commonly seen in males, maximum in the age group of 40 to 50 years. Most common presenting symptom is visible dilated veins over lower limb but more than half of the patients present with one or more complications. Most commonly venous system involved is great

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saphenous vein system and involved perforators are below knee perforators. SSFL with stripping of long saphenous was the common procedure performed. None of the cases had recurrence after six months of follow-up. Operative line of management should be the first line of treatment even though conservative management relieves the symptoms but always requires a definitive management.

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