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Prospective Clinical Study of Varicose Vein

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Abstract

Context: The varicose vein is a common chronic peripheral vascular disease affecting the lower limbs. They have significant impact on the quality of life. Even though considerable advances in understanding venous pathophysiology and modern imaging techniques have revolutionized the lower limb varicosity management, whether these inferences hold good for our population is a pertinent question.

Aims: To evaluate the clinical presentation and surgical outcome of management of varicose vein.

Settings and Design: Prospective observational study.

Methods and Material: Prospectively patients with symptoms and signs of varicose vein are evaluated. Precise proforma used to collect patient's demographic details, clinical features, and investigation reports; during the study from August 2016 to November 2018.

Statistical analysis used: univariate analysis, percentages.

Results: This study includes 132 patients, seventy-two (54.54%) are males, and sixty (45.45%) are females. In this study, varicose veins are commonly seen in the 40–50yr's age, and the right limb was affected in 51.38% than the left limb 88 (48.62%). The incompetence of the Saphenofemoral junction valve is seen in 24 (13.26%) patients, saphenopopliteal Valve incompetent in 17 (9.39%) patients & below knee perforator in 32 (17.67%) patients. Twenty-one out (15.90 %) of one thirty-two had a complication in our study; the commonest was surgical site infection in twelve (7.2%) patients.

Conclusions: The varicose veins of lower limbs are a disease of the all-age adult group, common in fourth and fifth decades of life. Patients usually presents with complications rather than the disease itself. The wound infection is the common postoperative complication.

Keywords: Flush Ligation; Saphenofemoral junction; Perforators; Varicose vein; Venous disease.

Key Messages: Management of varicose vein is technology driven, Good results can be achieved by proper selection of patients and appropriate procedures.

Introduction

Varicose veins (VVs) of lower limbs are prevalent in the general population 10-30%.[1,2] Varicose veins prevalent all over the world, influenced by activity and lifestyle. Varicose veins are more common in women than in men. Venous reflux is because of the failed functioning of valves in the Great saphenous and short saphenous veins, resulting in retrograde flow and stasis of venous blood in the saphenous vein and its tributaries. Stasis will be evident clinically in the form of varicose veins, reticular veins, and telangiectasias. Early stages of venous reflux may occur in as many as 25% of women and 15% of men.[1] Later stages of venous reflux, such as venous ulceration, may occur in 5% of the population.[3,4] Ambulatory venous hypertension is the underlying cause of venous ulcers. The determinants of ambulatory venous pressure are complex and include venous reflux, obstruction, and calf muscle pump dysfunction.[5] In

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addition to valvar dysfunction, a poor calf muscle pump mechanism may worsen venous reflux. The patients with venous disease usually present with aching, heaviness, throbbing, burning, or bursting over the affected area or whole lower limb. Varicose veins, though a common condition, many times remain asymptomatic. In developed countries, patients present early with cosmetic reasons (telangiectasia, reticular veins, dilated tortuous veins); however, in our Indian scenario, patients present with disease sequel like eczema nonhealing ulcer, lipodermatosclerosis. Varicose veins are common surgical problems in low socio-economic class people, which compel the patient to change his occupation. Treatment modalities tumescent ablations (endothermal, laser, radiofrequency), nontumecent ablations [ultrasound-guided foam sclerotherapy, catheter-directed sclerotherapy, mechanicochemical ablation, endovenous glue, open surgical methods (saphenofemoral ligation with stripping of Great Saphenous Vein (GSV), saphenopopliteal junction ligation with stripping of Short Saphenous Vein (SSV), Adjunctive techniques like phlebectomy, perforator ligation)] used to treat the varicose vein. With recent advances in evaluating venous anatomy and hemodynamics, the therapy for varicose veins is changing. This study is done to access the risk factors, clinical profile of patients, management, and outcome at a southern Indian tertiary care center.

Materials and Methods

This is a prospective observational study performed on patients presenting with symptoms or referred to us for varicose veins management in our tertiary care hospital. The study was done with institutional ethical committee approval and written informed consent from the study participants. Clinical material consists of one hundred thirty-two patients (n=132) presenting to the surgical outpatient department with symptoms of varicosities of the lower limbs from august 2017 to September 2019.

Inclusion criteria

- Patients diagnosed with a primary varicose vein or with its sequelae in lower limbs due to valve or perforators incompetence.
- Patients aged more than eighteen years.
- Participants willing to give consent to study.

Exclusion criteria

- Secondary varicose veins.
- Pregnant ladies.
- Recurrent varicose veins.
- Patients with lymphedema.

All patients presenting with varicose vein symptoms underwent clinical evaluation, duplex ultrasonogram, and evaluated for secondary varicose veins. Patient's demographic details, symptoms, and signs, investigating test results, superficial venous mapping, and incompetent perforator are marked before surgery, procedure details, postoperative outcomes, are entered in Microsoft excel sheet in a precise format. Data analysis percentages and proportions are done.

Results

Two hundred thirteen patients visited the surgery outpatient department with symptoms of varicose vein on evaluation. One hundred thirty-two patients are suitable for this study (n=132) According to the inclusion and exclusion criteria. Seventy-two (54.54%) are males and sixty (45.45%) are females. Twenty-five (18.93%) patients have a family history with more than two members, first or second-degree relatives involved.

Age distribution

In this study, most of the patients belong to the age group of forty-one to fifty years (Table:1); Youngest was nineteen years, and the older one was sixty-nine years, with the median age of occurrence is forty-three years, the mean age of the study population is 43.24 yr's.

Table 1: Age distribution.

S.No.	Age in years	No. of patient	Percentage (n=132)
1.	18-20	2	1.51%
2.	21-30	15	11.36%
3.	31-40	27	20.45%
4.	41-50	66	50%
5.	51-60	12	9.09%
6.	61-70	10	7.57%

Abbreviations: [n= number of patients]

Table 2: Occupation of Patients.

S. No.	Occupation	No. of Patient	Percentage
1.	Business	11	8.33%
2.	Driver/Conductor	15	11.36%
3.	Schoolteacher	16	12.12%
4.	Farmer	21	15.90%
5.	Housewife	18	13.63%
6.	Construction field worker	13	9.84%
7.	Hotel worker	38	28.79%

Table 3: CEAP Classification (N=181)

Type	Number of limbs	Percentage	Type	Number of limbs	Percentage
Clinical			Etiological		
C_0: No signs of venous disease	4	2.21%	EC: Congenital	1	0.76%
C_1: Telangectasia reticular veins	20	11.04%	E.P.: Primary	168	92.81%
C_2: varicose veins	65	35.91%	E.S.: Secondary	12	6.62%
C_3: Edema	22	12.15%	EN: No venous cause identified	0	0
C_4a: Pigmentation and Eczema	18	9.94%	Anatomic		
C_4b:Lipodermatosclerosis or Atrophie blanch	17	9.39%	AS: Superficial veins	139	76.78%
C_5: Healed venous ulcer	20	11.04%	A. P.: Perforating veins	32	17.67%
C_6: Active venous ulcer.	15	8.28%	Ad: Deep veins	10	5.52%
S-Symptomatic	166	91.71%	An: No venous location identified	0	0%
A- Asymptomatic	15	8.28%			
Pathophysiology					
Pr: Reflux	156	86.18%	Pr,o: reflux and obstruction	15	8.28%
Po: obstruction	10	5.52%	Pn: no venous pathophysiology identifiable	-	-

Table 4: Features of involvement.

Limb involvement	No of limbs	Percentage
Unilateral limb	83	62.88%
Bilateral	49	37.12%
Left Limb	88	48.62%
Right Limb	93	51.38%
System involved		
Saphenofemoral junction	24	13.26%
Saphenopopliteal Valve	17	9.39%
Perforator	32	17.67%
Saphenofemoral + perforator	76	41.99%
Saphenofemoral + sapheno poplitial + perforator	32	17.67%

Table 5: Procedures Performed.

Procedure	Number	Percentage
Shapaneo femoral flush ligation (SFL)	24	14.45%
SFL with stripping of GSV up to Knee	20	12.04
SFL with stripping of GSV up to the ankle	8	4.81%
Subfacial perforator ligation (SFPL)	21	12.65%
SFPLwith segmental phlebectomy	11	6.62%
SFL with SFPL	48	28.91%
Shapaneo popliteal junction ligation (SPL)	17	10.24%
SFL+ SPL + SFPL	22	13.25%
SFL with stripping of GSV up to Knee + SFPL	10	6.02%
Total	166	

Table 6: Postoperative Complications.

Complications	Number of limbs 166	percentage
Surgical site infection	12	7.2%
Hematoma	4	2.40%
Saphenous Neuritis	1	0.60%
Lymphorrhea	1	0.60%
Wound dehiscence	2	1.20%
Vascular injury		
Femoral vein	1	0.60%
Femoral artery	-	-
Deep vein thrombosis	-	-
Post Phlebitis limb	-	-

Occupational Distribution

Out of 132 patients observed in this study, the majority belonged to the prolonged standing or hard-working group (Table: 2).

Family history

Twenty-five patients had a family history with two or more members belonging to first or second-degree relatives involved by the varicose vein.

Clinical manifestation

Patient clinical presentation grouped according to CEAP classification. (Table : 3), Limb involvement and venous system involvement (Table: 4).

Incompetence System

In this study, the patients have incompetence of valves at multiple sites. Most of them had combined saphenofemoral and perforator incompetence (Table 4), followed by combined sapheno-popliteal and perforator incompetence. Less commonly isolated site incompetence seen.

Management

Venous stocking advised to asymptomatic and patient not willing for surgery. Patients with venous ulcers are treated by four-layer compression dressing for a maximum of six times each for a week to ten days. The patient with eczema, edema, cellulitis is treated until surgery was feasible in these patients with stockings, limb elevation, antibiotics.

Procedure performed

Most of the patients underwent a combination procedure. For statistics, analysis limbs are counted rather than the individual patient. A more common procedure performed is saphenofemoral flush ligation and subfacial perforator ligation, followed by Saphenopopliteal ligation along with Saphenofemoral flush ligation and subfacial perforator ligation. Details in Table 5.

Outcome of surgery

Twenty-one patients had complications in the postoperative period for a variable period of one month to two years six months. The most typical complication in this duration was surgical site infection at a subfacial perforator ligation site, followed by Hematoma, Saphenous Neuritis, Wound dehiscence, Lymphorrhea (Table 6).

Discussion

Varicose veins are a common clinical problem that starts early in life but assumes a silent course for a variable period before developing complications due to venous hypertension. On a broad basis, Varicose veins are classified into two types, namely: primary and secondary varicose veins. Defective valve functioning and decreased elasticity in the vein wall, resulting in reflux (reversed flow in the vein circuit), are primary causes of varicose veins. Valve damage is the most common etiology of primary varicose veins, leading to increased pressure and elasticity.[6] The real etiology of these malfunctioned valves remains exclusive but is likely multifactorial. In this study, patient's occupation with prolonged standing constituted the most significant factor in 38(28.79%) patients (Table 2).

Demographic

In our study of 132 patients, seventy-two (54.54%) are males, and sixty (45.45%) are females is similar to previous studies; more male populations were affected than females, probably due to occupationally related risk factors.[7,1] In other studies, however, females have preponderance.[8,9,10,11] A study on the outcome of surgical management and recurrences of varicose veins, by Das K et al., showed that patients were found mostly in the age group of 41 to 60, and the second most common age group was between 21-40 yr's of the age.[11] In this study, sixty-six patients (50%) belong to the age group of 40–50 yr's followed by twenty-seven (20.45%) patients belong to 31- 40 yr's, fifteen patients (11.3%) belong to a group of 21–30 yr's (Table 1). In few other studies, 41-50 yr's patients are commonly affected.[12] In some other series, 21- 40 yr's are affected.[8,13]

Clinical manifestation & management

Concerning limb affection in our study, right limb 93(51.38%) were affected more than left limb 88 (48.62%). Eight three (62.88%) patients had Unilateral limb Involvement & forty-nine patients (37.12%) had bilateral limb involvement (Table 3). This is similar to other studies that right-sided varicose veins account for 69.9% and bilaterality in 46.2-61.3%.[13,10,9,8] However, other study series found left-sided involvement in the range of 53.8-65%[17,20,21,24] because venous drainage through the pelvis follows a more tortuous course in the left lower limb since the right common iliac artery traverses over the left common iliac vein enhancing the risk of the left side.[13]

In terms of the venous system affectation in this study, SFJ was incompetent in 24 (13.26%) patients, SPVincompetent in 17 (9.39%) patients, only below knee perforator in 32 (17.67%) patients, Saphenofemoral junction with perforator seen in 76 (41.99%) Saphenofemoral + saphenopopliteal + perforator in 32 (17.67%). Studies have shown that the superficial veins of the GSV were involved in 72.4%, closely followed by perforator incompetence.[14,15] Varicose veins usually come to the patient's attention because of the symptoms and signs, otherwise referred to as varicose veins complications. Pramod M et al. found that complications like abnormal skin sensation (itching, aching, and tingling), leg pain, limb fatigue and heaviness, swelling, and restless leg syndrome constitute treatment indications.[16] Our findings are all the same as these studies & agree with these study results (Table 3).

Presently the diagnosis of varicose veins is clinical and diagnostic Doppler ultrasound scanning. In this study, all patients had duplex scanning as a mandatory preoperative workup. Patients with chronic DVT, asymptomatic, were excluded from surgery. Earlier, Trendelenburg, Perthes, Linton, Schwartz tests, including Morison cough impulse tests, Pratt test, and Fegan method, were used to diagnose varicose veins. However, several studies have validated the inaccuracy of these acronyms' tests.[17,18] Patients with a venous ulcer, eczema, edema are treated by the Bisgaard regime (bandaging, elevation, exercise, massage, antibiotics). The combination of surgical procedures done in our study (Table 5) depending upon the system involved (Table 4) Combination of flush ligation, division, stripping, and multiple stab avulsion standards for varicose vein surgery. Other newer treatment modes are technologically driven and include radiofrequency ablation, endovenous laser treatment, and endovenous laser ablation. Recently radiofrequency ablation started in our institute to manage varicose vein patients and was not included in the study due to nonavailability at the beginning of this study.

Complications

The various surgeries for varicose veins are associated with complications as of any surgical procedures. Preoperative assessment and the principles of elective surgical procedure for a pathological vein are essential in reducing complications. Defty C et al. reported around 18-20% of post-op complications. There was no incidence of deep vein thrombosis or pulmonary embolism postoperatively in this series.[19] Other literature shows the incidence to be very low at 0.01%. Twenty-one out (15.90%) of one thirty-two had a complication in our study, no significant differences seen. Surgical site infection noted in twelve (7.2%) patients, Hematoma in four (2.40%), Saphenous Neuritis in one (0.60%) patient, Lymphorrhagia in one (0.60%), Wound dehiscence in two (1.20%), Vascular injury in the form of needle injury to Femoral vein in one (0.60%) patient.

Conclusion

The varicose veins of lower limbs are a disease of the all age group, occurring more commonly during the fourth and fifth decades of life. The occupations involving prolonged standing and violent muscular efforts are more prone to developing varicose veins. Another contributory factor is the presence of family history. Majority of the patients presented with complications rather than the disease itself. The presence of prominent swellings in the lower limb and pain was the most typical presenting symptoms. The presence of more than one valvular incompetence is more common than individual incompetence. Saphenofemoral junction flush ligation with multiple subfascial ligations of perforators was the most routine operation in our hospital. Other procedures are done depending on the requirement in the management of a patient. The wound infection is the common postoperative complication in this study

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Conflict of Interest: **NIL**

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