

Assessment of open surgical outcome of patients with lower limb varicose vein disease at a tertiary care center of Eastern Nepal

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ABSTRACT

Introduction: The trend of varicose vein disease seems to be rising globally and its treatment options and outcome vary from the institution by institution. Management of the disease has also changed from high ligation, stripping, avulsion, and sclerotherapy to minimally invasive endovenous thermal ablation. **Methods:** A retrospective observational study was carried out to find out the treatment methods and outcome of lower limb varicose vein disease at the cardiothoracic vascular surgery unit of the surgery department of B.P. Koirala Institute of Health Science from February 2019 to February 2020. The medical record of the patients was studied, relevant data entered and analyzed in statistical package for social sciences statistical software. **Results:** Total registered patient during the study period were 46; which included 29(63%) male and 17(37%) female with mean age 38.41±10.12. Saphenous femoral junction reflux was seen in 38(82.60%) cases, saphenous popliteal junction reflux was seen in nine (19.60%) cases while perforator reflux was seen in 37(80.40%) cases. Saphenous femoral junction ligation, saphenous popliteal junction ligation was performed in 36(78.30%) and 7(15.20%) cases respectively. Stripping of the greater saphenous vein was done in 35(76.10%) cases, and 9(19.60%) cases were managed conservatively. Only 5(10.90%) cases developed infection, and none of the cases were found with recurrence or nerve injury. All the cases remained satisfied during the management course. **Conclusions:** Saphenous femoral junction reflux was seen common and saphenous femoral junction ligation was performed on majority of the cases. Only 10% cases developed infection and all patients were satisfied during management course. Early surgical management of the disease overcomes complications and improves in the quality of life of the patients.

Keywords: Flush ligation and stripping, greater saphenous vein, short saphenous vein, varicose vein, venous insufficiency.

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INTRODUCTION

Varicose vein diseases of the lower limb are encountered commonly in different specialty clinic and there is an increase in the disease spectrum globally. The prevalence of the disease varies and is thought to be between 1 to 73% in women, and 2 to 56% in men.^{1,2} It is thought to be underdiagnosed and treatment options are limited to few centers only. Early diagnosis and treatment of the disease prevents further complications and improve quality of life.^{1,3}

The disease can have various presentations with different uncomplicated reflux patterns, involving superficial, deep, and perforating veins, alone or in combinations. It can present late with complications like severe skin changes, healed or unhealed ulcer and thrombosis, or sometimes can be late asymptomatic presentation also.^{4,5} Standard open surgical treatment of uncomplicated varicose vein involves flush ligation with or without stripping of the greater saphenous vein or small saphenous vein with ligation of reflux perforating veins.^{6,7}

Standard open surgery of the varicose vein has been standard

procedure for many years and remains popular in many centers. However, the treatment options have changed recently from standard open surgery to minimally invasive, less traumatic techniques.^{5,8} Although there have been many advances in minimally invasive surgical techniques, such treatments are expensive and limited to fewer centers only. There are some randomized controlled trials (RCTs) comparing standard surgery and endovenous thermal ablation, looking at certain measures such as recurrence, neovascularization, post-procedural complications, and quality of life, whose long-term reports are eagerly awaited.^{5,9-11}

Complicated varicose vein disease with active venous ulcers have longer conservative treatment course with four layers of compression bandage application which seems to provide better outcome. With the advancement of technology and economy, the management of varicose vein disease aims for faster recovery, excellent cosmetic results, few complications, and less recurrence rate. However, the standard varicose vein surgery clinical outcome and results of the procedure seems to be satisfactory at our contest as reported by many patients. So, we aimed to retrospectively evaluate the treatment and outcome of lower limb varicose vein disease at our setup.

METHODS

Study Design and Setting

A single-centered, retrospective cross-sectional observational analysis was conducted from February 2019 to February 2020 by reviewing the medical records of patients from the medical record section which were managed for lower limb varicose vein disease under cardiothoracic vascular surgery unit. We included 46 patients managed during the study period. The study was conducted after obtaining ethical clearance from the Institutional Review Committee of B.P Koirala Institute of Health Science, Dharan. (Ref. No.: 223/076/077-IRC)

Data Management

All the relevant information from the medical record section, including age, sex, clinical features, Duplex scan of affected limbs, types of surgery performed, total hospital stay and complications or any problems encountered during the patient care were taken and entered in statistical package for social sciences statistical (SPSS) software (version 16.0). Mean and standard deviation was computed for continuous data and percentages were calculated for categorical data.

Pre-operative Assessment

The inclusion criteria for the surgery were reflux in saphenous femoral junction (SFJ) or saphenous popliteal junction (SPJ) clinically and with duplex scan, with or without any perforator involved. Complete clinical examination and local examination of the lower limb varicose veins along with a color duplex scan were done before management. Patients having deep vein thrombosis or severe infections or active ulcers of the affected limb were excluded and managed conservatively. Surgery was planned if the clinical examination and a color duplex scan showed symptoms linked to varicose vein disease and the patient was likely to improve after the procedure.

The color duplex scan showed reflux in the SFJ or SPJ or perforator vein. Standard open surgery with SFJ ligation, stripping, SPJ ligation and avulsion, was planned accordingly with the preoperative marking of the veins under spinal anesthesia after obtaining written consent from the patients.

Surgical Management

The open surgery protocol for flush ligation and stripping was followed. At the groin, the cribriform fascia was incised along standard lines to expose the SFJ adequately, for high ligation, ligation of all its branches, and preparing to remove 10 cm below the knee or sometimes strip to the ankle. Surgery was performed for primary and few recurrence cases. After the SFJ high ligation, the stripper was downward passed through the greater saphenous vein and stripped below applying a 15-minute continuous compression.

After compression, hemostasis was checked and then avulsion of remaining varicose veins marked previously was performed. Crepe bandage was applied after proper dressing of the wounds closed subcuticularly. Patients were managed with intravenous antibiotics, analgesic, and other supportive measures. Routine use of subcutaneous heparin was avoided, and given for high-risk patients only. Crepe bandage was removed and replaced by anti-embolism stockings after the wounds were dry preferably on the second postoperative day. All patients stayed for minimum of two to five days in the hospital where all measures were taken to assess and manage complications of the procedure if any.

Postoperative follow-up

All patients were first followed up between five to fifteen days after surgery. Clear instructions were given for wound care and to identify any adverse effects and ways to tackle

it. Patients were asked to continue stockings for a minimum of three weeks of surgery and the second followed up was planned after one month of surgery. Initially, the patients were followed for 90 days and then yearly, to assess for any late complications.

RESULTS

There were 46 patients managed for lower limb varicose vein disease, which included 29(63%) male and 17(37%) female, with mean age of 38.41±10.12. Right leg varicose vein was seen in 18(39.10%) cases and left leg varicose vein was seen in 16(34.80%) cases while both lower limb varicose veins were seen in 12(26.10%) cases (Table 1). SFJ reflux was seen in 38(82.60%) cases, SPJ reflux was seen in 9(19.60%) cases while perforator reflux was seen in 37(80.40%) cases. Majority of the patient had skin changes 21(45.70%) followed by edema in 14(30.40%) patients (Table 2).

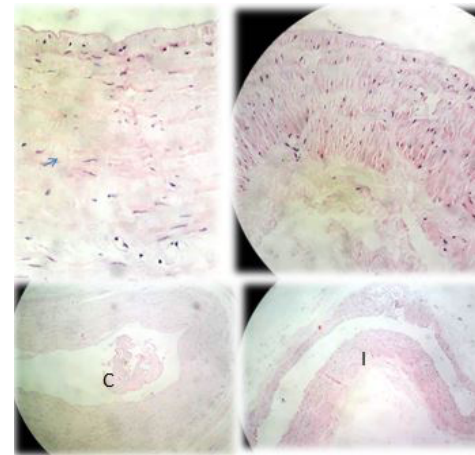
SFJ ligation (A section of HPE in Figure 1), SPJ ligation was performed in 36 (78.30%) and 7(15.20%) cases respectively. Stripping of GSV with avulsion was done in 35(76.10%) cases and 9(19.60%) cases were managed conservatively. There were five (10.90%) cases with infection, and there were no cases with recurrence or nerve injury. All the patients remained satisfied during the management course. The mean hospital stay of the cases was 3.22(2 to 5) days.

Table 1: Characteristics of patients of lower limb varicose diseases

Variables	Frequency	Percentage(%) /median/mean
Age (in years, Median)	46	36.50
Gender		
Female	17	37
Male	29	63
Limb involved		
Right	18	39.10
Left	16	34.80
Both	12	26.10
Reflux		
SFJ Reflux	38	82.60
SPJ Reflux	9	19.60
Perforator Reflux	37	80.40
Management		
SFJ Ligation	36	78.30
SPJ Ligation	7	15.20
Stripping (GSV)	35	76.10
Conservative Management	9	19.60
Complication		
Infection/Hematoma	5	10.90
Nerve	0	0
Recurrence	0	0
Patient Satisfaction		
Satisfied	46	100
Unsatisfied	0	0
Total Hospital Stay (Mean)	46	3.22

Table 2: Clinical characteristics of patients

Clinical Stage	Frequency	Percentage (%)
Edema	14	30.40
Skin Changes	21	45.70
Healed Venous Ulcer	9	19.60
Active Venous Ulcer	2	4.30
Total	46	100.00



H&E stained vein section of varicose vein disease shows proliferation of collagen fibers (C) in intimal layer causing intimal hypertrophy (I)

Figure 1: Shows vein section of SFJ Incompetence

DISCUSSION

Varicose vein disease is rising globally and its treatment options and outcome vary from the institution by institution. The disease itself have various presentations with different reflux patterns involving superficial, deep, and perforating veins alone or in combinations.⁴ The disease can present late with severe skin changes, healed or unhealed ulcers or sometimes can be even asymptomatic presentation.^{4,6,12} The majority of our cases had edema (30.40%), while healed venous ulcer and active venous ulcer was seen in 19.60% cases and 4.30% cases respectively.

Depending upon the nature and presentation of the disease, high ligation of the great saphenous vein or small saphenous vein is performed, after which stripping of the GSV and avulsion of varicosities or ligation of reflux perforating veins is performed according to the preoperative assessment.^{5,7,13} Our study showed that 36(78.30%) cases required SFJ ligation and 7(15.20%) cases underwent SPJ ligation. Stripping with avulsion was done in 35(76.10%) cases while 9(19.60%) cases were managed conservatively.

The disease is a common problem affecting a large proportion of patients and it affects the quality of life significantly.^{14,15} Standard varicose vein surgeries involving SFJ ligation and stripping has been performed to manage uncomplicated cases for over a century. The surgery remains the gold standard against which newer minimally

invasive techniques with laser, radio-frequency ablation or sclerotherapy are evaluated.^{3,5,7}

Our study demonstrated that standard open surgical treatment offers satisfactory results with the satisfactory patient outcome at our center. Treating cases of SFJ reflux with flush ligation, ligation of all its tributaries, and stripping is a routine part of treating long saphenous varicose vein disease. SPJ reflux is carefully ligated at the junction and careful dissection is performed to avoid injury to the adjacent nerve structures. A simple surgical loop can sometimes be helpful with accurate dissection. Dwerryhouse et al.¹⁶ demonstrated that SFJ flush ligation and stripping reduces the rate of recurrence after several years of surgery.

To reduce recurrence and complications, accurate location and ligation of the reflux veins are crucial and with the preoperative marking of the veins and identification of the pathological points, we were able to reduce our recurrence case and complications like nerve injury. Hammarsten et al.¹⁷ reported similar results for flush ligation and stripping at 52 months follow-up.

In the study conducted by Rasmussen et al.^{9,10} on the complication of varicose vein surgery, they reported complications like deep vein thrombosis, paraesthesia, and hyperpigmentation in the postoperative period. There were no such complications seen in our study. There were five cases (10.90%) that had an infection which was managed with systemic antibiotics and other supportive measures. Like in the MAGNA study⁸, infection rate was higher but are not statistically significant with the standard open surgical techniques.

Standard open surgical techniques tend to have a longer recovery period of 3.89 days as shown by Defty et al.^{15,18} Our study also showed similar results of mean hospital stay of 3.22 days. However, only 1.15 days of hospital stay was seen with minimally invasive techniques like radiofrequency ablation.^{9,10} All the cases in our study stayed satisfied after treatment till a follow-up period of 90 days. The study conducted by Mackenzie et al. also concluded that there is a patient's satisfaction and improvement in the quality of life soon after four weeks from standard open surgery.

CONCLUSIONS

Saphenous femoral junction reflux was seen common and Saphenous femoral junction ligation was performed on majority of the cases. Only 10% cases developed infection and all patients were satisfied during management course. Early management of the disease overcomes complications and improves in the quality of life.

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