

ORIGINAL RESEARCH**Efficacy of Sub Fascial Endoscopic Perforator Surgery (SEPS) in the Treatment of Lower Limb Varicosities with Perforator Incompetence****N.Ashok Vardhan Kumar¹, Hareesha Jaggari², J. Parthasarathi¹, Md Shadab Jaseem¹**¹Assistant Professor, Department of General Surgery, Govt Medical College, Nalgonda, Telangana, India.²Assistant Professor, Department Of General Surgery, Niloufer Hospital, Hyderabad, Telangana, India.**ABSTRACT****Background:**To study the efficacy of sub fascial endoscopic perforator surgery (SEPS) in the treatment of lower limb varicosities with perforator incompetence.**Materials and Methods:** The present study is A Prospective Comparative Study Between Seps And Open Perforator Ligation To Know The Efficacy Of Seps In Treating Varicose Veins done at Kamineni institute of medical sciences, Narketpally from October 2017-september 2019. 50 cases of varicose veins with perforator incompetence were studied, the statistical data and analysis of the cases studied during this period are presented in the study.**Results:** In the present study, One thirds (16/50 i.e 32%) of the patients in our study were in the age group of >60 years. The ratio of male to female was 2.33:1. In our study 36%(i.e.18 patients) had involvement of left lower limb out of which 9 patients underwent SEPS and 9 underwent open ligation. Right lower limb involvement was seen in 42%(i.e.21 patients) out of which 15 underwent SEPS and 6 underwent Open ligation. Both limbs involvement was seen in 22%(i.e.11 patients) out of which 1 underwent SEPS and 10 underwent OPEN LIGATION. In our study 100% of the patients had dilated veins and discomfort as presenting symptoms. Itching was present in 88% of patients; skin pigmentation in 46%; edema 82% and ulceration in 14% of patients. 7 patients (14%) amongst the 50 patients had an active ulcer at the time of presentation. All were having single ulcers, most of them(4/7) less than <1 yr duration. 4 among 7 patients with venous ulcer underwent seps, 3 underwent open ligation. In SEPS group, 3 perforators were ligated in 10 out of 25 patients and more than 3(4-5) perforators were ligated in 15 out of 25 patients. In open perforator ligation group, 3 perforators were ligated in 17 out of 25 patients and more than 3(4-5) perforators were ligated in 8 out of 25 patients. In our study no post, operative complications were observed in the seps group but in open perforator ligation group 2 patients developed complications like haematoma, wound infection and wound dehiscence. Post operative persistence of dilated veins and discomfort was noted only in one patient out of 50 and belonged to open ligation group. The ulcer healed in all the 4 patients who underwent SEPS, but in open ligation group out of 3 patients ulcer healed only in 2 patients and persisted in one. In SEPS group, edema subsided in 11 out of 25 patients but persisted in 14, while in OPEN perforator ligation group edema subsided in only 2 out of 25 patients and persisted in 23 patients. Post operative stay-Among 25 patients who underwent SEPS 24 patients stayed for <10 days, whereas in open ligation group all the 25 patients stayed for > 10 days and 3 of them stayed for >20 days.**Conclusion:** SEPS should be an added procedure along with conventional varicose veins surgery in order to reduce long term recurrences of the venous ulcer and promote wound healing. Hence with the favourable and significant ulcer healing rate with

improvement and reduction in clinical severity suggests that SEPS plays an important role in surgical management of advanced stages of venous insufficiency.

Keywords: SEPS, Open Ligation, Varicose veins, Edema, Post operative complications.

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INTRODUCTION

Varicose veins of lower limb present with a spectrum of clinical features ranging from pain or heaviness of affected limb to non-healing ulcers over the lower limb. The development of this chronic venous insufficiency pathology is well attributed to venous hypertension either caused by obstruction, valvular reflux or both involving superficial, deep or perforator veins. The patients with varicose veins usually require some form of surgical intervention since the conservative therapy including compression, lifestyle modification and venotonic medications are expensive with risk of persisting symptoms. Primary valvular incompetence, leading to cutaneous venous hypertension in 60% of the patients results in a series of cutaneous manifestation which in its severe form presents as ulcers over the lower third of leg. The deep venous system communicates with the superficial system by the perforators with inward flow. Perforator Incompetence is one of the leading cause for chronic venous insufficiency in lower limbs.

Many studies have demonstrated that most patients with venous or varicose ulcers or long-standing venous insufficiency have a large number of incompetent perforators compared to patients with uncomplicated varicose veins. The surgery for perforators like the stab avulsions or multiple phlebectomies, fails to correct the outward flow in perforators in most cases. This is because, the removal of superficial varicosities do not affect the transmission of high venous pressure from the calf pump to the microcirculation of the skin of the “gaiter’s area” called as the “blow out syndrome” The open perforator ligation requires either multiple skin incisions in the leg which at times may be required to be done in unhealthy skin which has resulted due to chronic venous insufficiency or a long medial incision to expose perforators (Linton’s procedure).SEPS is a less invasive technique when compared to the above procedures as this is performed by 2- 3 small incisions in upper third of leg where the skin is healthy and supple. This has the potential benefit of reducing wound infections and early wound healing and hence reduced hospital stay.

Hence subfascial endoscopic perforator ligation surgery is an appropriate option for all incompetent perforating veins reducing the burden of treating the advanced chronic venous insufficiency and in patients with active ulcer with better outcome and efficacy.

Aim

To study the efficacy of sub fascial endoscopic perforator surgery (SEPS) in the treatment of lower limb varicosities with perforator incompetence.

Objectives

1. To study the age wise distribution of varicose veins in patients
2. To study gender wise distribution of varicose veins in patients
3. To study the clinical features of varicose veins
4. To study the effectiveness of SEPS compared to open ligation in rate of healing of ulcer
5. To study the complication rates
6. To study the recurrence rate

MATERIALS & METHODS

- Patients in General surgery OPD, diagnosed as lower limb varicosities and admitted in KIMS, Narketpally were studied after informed, written and verbal consent.
- Detailed clinical history taken, general and local examination and complete surgical profile done.
- Specific examinations like Venous Colour Doppler of the involved lower limb also done.
- 50 Patients were selected at random for open and endoscopic perforator surgery (25 each)
- Follow up after surgery 2 wks,1month,3months and 6 months for recurrence and complications

Preoperative preparation:

Pre-operative evaluation included duplex scanning of the affected limb and the incompetence in superficial, deep and perforator levels were documented. The incompetent perforator vein on the skin was marked accurately using a skin marker on the day of surgery using doppler which helps the surgeon during surgery. All patients received a single dose prophylactic antibiotic just before induction of anaesthesia.



Figure 1: Marked perforators leg



Figure 2: Venous ulcer over lower leg



Figure 3: Venous ulcer over gaiter's area



Operative technique:

The procedure of SEPS was performed under spinal anaesthesia. Patient in supine position and in Trendelenberg position with flexion and abduction at hip and flexion at knee. In our study this technique was performed using two port technique. We did not use the tourniquet during the surgery. Limb was painted and draped. A skin incision was made measuring 13 mm one hand breadth or 5 cm below and medial to tibial tuberosity and was deepened in layers. Skin retractors used for better visualization. The deep fascia was identified and incised.

Post-operative assessment:

Once the spinal anaesthesia wears off, the patients were encouraged to ambulate on the day of surgery and all patients received antibiotics for 48 hours post-surgery. Patients were discharged in 3-6 days with post-operative instructions on ambulation, limb elevation and maintaining the elasto- crepe compression bandage regularly. Ulcer dressings were done regularly and skin sutures removed on follow up with assessment of clinical symptom reduction and ulcer size reduction at 1st, 2nd and 3rd week post-surgery.

RESULTS**Table 1: Age Wise Distribution of Patients Presenting with Perforator Incompetence Included in the Study**

Age	Seps group [n-25]	Open perforator ligation group[n- 25]	Total [n-50]
21-30yr	6/25	4/25	10/50(20%)
31-40yr	2/25	1/25	3/50(6%)
41-50yr	5/25	4/25	9/50(18%)
51-60yr	3/25	8/25	11/50(22%)
>60yr	9/25	8/25	17/50(34%)
Total	25/25	25/25	50(n)

One thirds (16/50 i.e 32%) of the patients in our study were in the age group of >60 years.

Table 2: sex distribution of patients presenting with perforator incompetence included in the study

	Seps group	Open perforatorLigation group	Total[n=50]
Totalno.Ofmales	21/25-42%	14/25-28%	35/50-(70%)
Totalnooffemales	4/25-16%	11/25-22%	15/50-(30%)

In our study which included a sample size of 50 Patients, two third of the patients were male and one-third were female.

The ratio of male to female was 2.33:1.

Table 3: involvement of limbs in patients presenting with perforator incompetence included in study

Involvement of Lower limbs	Seps Group	Open Ligation group	Total [n=50]
Left	9/25	9/25	18/50(36%)
Right	15/25	6/25	21/50(42%)
Bilateral	1/25	10/25	11/50(22%)

In our study 36%(i.e.18 patients) had involvement of left lower limb out of which 9 patients underwent SEPS and 9 underwent open ligation.

Right lower limb involvement was seen in 42%(i.e.21 patients) out of which 15 underwent SEPS and 6 underwent Open ligation.

Both limbs involvement was seen in 22%(i.e.11 patients) out of which 1 underwent SEPS and 10 underwent open ligation.

Table 4: presenting symptoms in patients with perforator incompetence included in the study

Symptom	Seps group	Open ligationGroup	Total[n=50]
Dilated/distendedVeins	25/25	25/25	50/50-(100%)
Pain/discomfort	25/25	25/25	50/50-(100%)
Itching	22/25	22/25	44/50-(88%)
Skinpigmentation	10/25	22/25	32/50-(46%)
Edema	15/25	26/25	41/50-(82%)
Ulceration	4/25	3/25	7/50-(14%)

In our study 100% of the patients had dilated veins and discomfort as presenting symptoms. Itching was present in 88% of patients; skin pigmentation in 46%; edema 82% and ulceration in 14% of patients.

Table 5: number of patients presenting clinically with active venous ulcer and their duration

Presentation	Seps group	Open perforatorLigation group	Total
<3months	1[25]	0	1[50]
3months-6months	1[25]	0	1[50]
6 months– 1 yr	1[25]	1[25]	2[50]
1yr- 2yrs	1[25]	2[25]	3[50]
Total	4[25]	3[25]	7[50]

7 patients (14%) amongst the 50 patients had an active ulcer at the time of presentation. All were having single ulcers, most of them(4/7) less than <1 yr duration

4 among 7 patients with venous ulcer underwent seps,3 underwent open ligation

Table 6: intra operative details of patients undergoing seps and open ligation in present study

	Seps group	Open perforator ligationGroup
TrendelenberG Operation+GSVStripping	13(25)	22(25)
No.OfperforatorsLigated		
1-3	10(25)	17(25)
4-5	15(25)	08(25)
Mean operating time	120mins[50]	135mins[50]

In SEPS group, 3 perforators were ligated in 10 out of 25 patients and more than 3(4-5) perforators were ligated in 15 out of 25 patients.In open perforator ligation group, 3 perforators were ligated in 17 out of 25 patients and more than 3(4-5) perforators were ligated in 8 out of 25 patients.

In our study the mean operating time for SEPS was 120 minutes and the mean operating time for open perforator ligation was 135 minutes.

Table 7: post operative complications

Complication	SEPS group	OpenPerforator ligation group	Total
WoundDehiscence//haematoma	0	1/25	1/50
Woundinfections	0	1/25	1/50
Skinnecrosis	0	0	0
DeepveinThrombosis	0	0	0
Total	0	2/25	2/50

In our study no post operative complications were observed in the seps group but in open perforator ligation group 2 patients developed complications like haematoma, wound infection and wound dehiscence.

Table 8: Persistence of clinical symptoms after surgery

Symptoms	Seps	Open perforator ligation	Total
PersistenceofDilatedveins	0	1/25	1/50-2%
PersistenceofPain/discomfort	0	1/25	1/50-2%
Ulceration	4/25	2/25	6/50-18%
Healed persistent	0	1/25	1/50-2%
Edema	11/25	2/25	13/50-26%
Subsidedpersistent	14/25	23/25	27/50-54%

Post operative persistence of dilated veins and discomfort was noted only in one patient out of 50 and belonged to open ligation group.

Table 9: duration of postoperative stay

Duration	Seps	Open perforatorLigation	Total
5-10days	24/25	0/25	24/50(48%)
11-20days	1/25	22/25	23/50(46%)
>20days	0/25	3/25	3/50(6%)

Patients who underwent SEPS has <10 days postoperative stay when compared to open ligation group who stayed for more than 10 days

DISCUSSION

Our study was a prospective longitudinal study of efficacy of subfascial endoscopic perforator surgery in a study population of 50 patients. After obtaining consent, the patients were included in the study. In our study we observed the mean age was 33.672. In the study published in Indian journal of surgery 2014 observed that 58% patients were in the age group of 16-35. The mean age was 33.6.^[1-3]

In our study we observed that the majority of the patients i.e. 70% were male and 30% were female. In a study reported by M.G.Vashist and Nitin singhal in Indian journal of surgery 2014, 70 patients out of 100 were males and 30 were females.^[4-6]

Tenbrook et al,^[7] have compared data from 20 studies and an overall average sex distribution was 51% females and 49% males. The reason for male predominance in our study could be because more number of males turned up for treatment.

Most patients in our study had a perforator incompetence in the right lower limb (42%). On left side in (36%) and bilateral disease (22%). Gloviczki et al,^[8] reported right sided involvement in 49% patients and left in 46% of patients and bilateral in 5% of patients under study. Hauer et al 26 reported 19% right sided chronic venous insufficiency and 35% on the left side.

Most common presenting symptom noted in our study(100% patients) was dilated veins and pain/discomfort, Itching, edema and pigmentation being other common symptoms. Active ulcer as a presenting symptom was noted only in 14% of the patients. In a study published by Dr. Devid Hazarika et al pain/discomfort (in 80% patients) was the most common symptom followed by dilated veins (in 73% patients). Active ulceration was noted in 4% of patients.

In our study the mean number of perforators ligated per limb were 4.5. In a study published in Indian journal of surgery by M.G. Vashisht and Nitin Singhal,^[6] a total of 314 perforators were ligated in 100 limbs. Pierik et al divided 54 perforators with the range of 1-6 averaging 2.9 perforators per limb.

Jugenheimer et al,^[9] reported “a total of 456 perforator ligation with a range of 2-11 with an average of 4 per limb”.

The operating time required for SEPS was less(120 minutes) in comparison to OPEN PERFORATOR LIGATION(135 minutes). In our study we observed that the rate of ulcer size reduction after 6 months post SEPS was 100% and open ligation is 66.7%. Synbrandy et al reported “a ulcer healing rate of 70% after SEPS”.

Tenbrook et al,^[7] reported “a median time as 30-60 days for complete healing after SEPS”.

Baron et al⁴³ reported “primary healing following SEPS in 41 out of 53 patients in 12 weeks and in the remaining 12 it took longer time but none exceeded 6 months”. In a study done Anjaykumar included 21 patients of varicose veins with the perforating vein incompetence underwent SEPS using harmonic scalpel showed “ulcer healing in 8 weeks with no recurrences in 11.9 month of follow up”. Negus and freugood reported “84% ulcer healing rate”.^[10]

In present study 2% of the patients dilated veins and discomfort persisted after surgery and they belonged to open perforator ligation group. In our study 6 % of the patients (OPEN LIGATION GROUP) developed postoperative complications like wound site infection, seroma, which subsided in 10 days with conservative management, haematoma formation which resolved in 2 weeks with medical management.

In our study in SEPS group no post operative complications observed. Jugenheimer and Junginger et al reported “dysesthesia in 9.7% (n=103 limbs) with severe subfascial infection in 2 (1.9%) patients”. Witten et al reported severe subfascial infection necessitating surgical intervention on both sides. Synbrandy et al reported “wound infection in 10% of patients”. Baron et al reported no wound complications in his study.^[11] Tenbrook et al,^[7] reported “9% haematoma formation”

The post operative stay was less (<10 days) in the SEPS group as compared to the open ligation group in which all the patients stayed in the hospital for more than 10 days and 3 out of 25 patients stayed for >20 days.

CONCLUSION

SEPS is a minimal invasive surgery and effective treatment with a feasibility to tackle the incompetent perforators of lower limbs which play an important role in advanced chronic venous insufficiency. SEPS has lower rates of complication, faster recovery and decrease in clinical severity of disease and hence is a better treatment in comparison to open perforator ligation.

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