ORIGINAL ARTICLE

An Experience of "Subfascial Endoscopic Perforator Surgery" in Chronic Venous Insufficiency at Sir Ganga Ram Hospital, Lahore

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ABSTRACT

Background: In varicose veins disease the incompetent perforators has a major contribution in the development of complications. Conventionally, in patients that have associated incompetent perforators require multiple incisions for ligation of these perforators. The advancement in the endoscopic techniques has permitted the use of this modality for perforator surgery.

Objective: To study the outcome and post-operative complication of Subfascial Endoscopic Perforator Surgery (SEPS) for treating complicated chronic venous insufficiency.

Methods: A total of twenty patients were included in this non randomized interventional study.conducted at surgical department of Sir Ganga Ram Hospital Lahore. The data was collected from September 2011 till March 2013. Non probability purposive sampling technique was used for sample selection.

Results: A total of 21 procedures were performed in 20 patients having mean age of 41.1 years. An average of four perforators were dealt with endoscopic surgery. Post-operative pain, hematoma 14.2%, edema in 5 cases (28.7%), surgical emphysema at port site in 5 patients (28.7%), bleeding due to slippage of clip in one patient (4.76%), saphenous neuralgia in one patient (4.76%) were main complications.Wound infection not seen in any case and there was no evidence of wound infection recorded during one month post-operatively. Mean hospital stay was 1.5days. At 1 month follow up ulcers healing was 90% in patients with active ulcers.

Conclusion: SEPS is a better and minimally invasive technique as compared to old Linton approach for management of venous ulcers leading to early patient mobility, early return to work and better ulcer healing.

Key words: Subfascial Endoscopic Perforator Surgery (SEPS), Venous Ulcers, chronic venous insufficiency.

INTRODUCTION

Subfascial Endoscopic Perforating Surgery (SEPS), is valuable in treatment of venous ulcer[1,2]. The procedure can be performed with better result with fewer complications than with sub fascial open surgical exploration [3]. Perforating vein insufficiency can lead to varicosity, various skin changes, and ulceration. These ulcers are notoriously slow to heal, and generally recur if the underlying cause of venous hypertension is not removed. Therefore the primary goal should be to relieve high venous pressure in the skin, with ligation of the insufficient perforating veins alone or combined with ligation of incompetent sephenofemoral and sephenopopliteal junction particularly in CEAP clinical class 5 and 6 disease[4]. In SEPS perforating veins are clipped and divided under direct vision through the endoscope. Furthermore, randomized clinical trials have demonstrated that when SEPS is compared with open perforator vein ligation, ulcer healing and recurrence rates are similar but there is significantly less morbidity with SEPS. [5,6,7]. Our experience with SEPS emphasizes that SEPS either alone or combined with flush ligation of greater saphenous vein (GSV) reflux aids venous ulcer healing.

OBJECTIVE

To study the outcome and post-operative complication of Subfascial Endoscopic Perforator Surgery (SEPS) for treating venous ulcers and skin changes associated with chronic venous insufficiency.

MATERIALS AND METHODS

This was a non-randomized Interventional study. Conducted at the Department of Surgery Sir GangaRam Hospital Lahore. Data was collected from September, 2011-March, 2013. Non probability purposive sampling technique was used for sample selection. Twenty 20 patients were included in this study. Demographic, physical and vascular laboratory data collected for all patients. Preoperative evaluation include detailed history and physical examination including trendelburg test along with color ultrasound scanning to locate incompetent superficial veins, deep veins and perforators.

DATA ANALYSIS

Data was entered and analyzed by using SPSS 15. Quantitative data was presented by using mean±SD. Qualitative data was presented by using frequency table and percentages.

SURGICAL TECHNIQUE

After establishing general (n = 8) or spinal anesthesia (n = 13), the affected limb was prepared from groin to ankle in a sterile fashion. The leg was then positioned with the knee and ankle elevated on padded stands so that the lower leg was elevated and parallel to the table, allowing unencumbered movement of instrument handles. Two incisions were placed in the upper calf. The first incision was placed 2 cm from the edge of the tibia and at least 10 cm distal to the tibial tuberosity. A 10 mm port was then placed in the initial incision, and the sub fascial tunnel is expanded and maintained with CO_2 insufflation to 15 mm Hg. A 10 mm scope, either 0° or 30°, provided excellent visualization and also aid in blunt dissection and retraction. Another 10 mm port was then placed approximately 5 cm lateral and distal to the first incision (Fig. 1). Connective tissue bridging the sub fascial plane was taken down by blunt or sharp dissection with standard laparoscopic dissectors and scissors. The perforating veins were then clipped with a clip applier. After interruption of all perforating veins and completion of the procedure the leg wrapped with an ace bandage. All patients with greater saphenous vein incompetence underwent concomitant flush ligation of GSV Patient were followed-up at 2 weeks, 1 month, and 3 months. Additional visits were scheduled as needed for ulcer care.

RESULTS

SEPS was performed on 21 limbs in 20 patients. Among them 19 were male and 2 were females (Table 1). One patient underwent bilateral SEPS. Mean age of patient was (40.7 years) and range from 27 year to 65 year. The most frequent symptom at presentation was pain in 14 patients (66.4%)and the most frequent sign were skin changes with healed ulcers in 6(28.7%) patients and active ulcer in 13(61.9%)patients. None of patients had previous surgery on limbs. Clinical severity score pre operatively was 5.73. Details of pre-opeative evaluation and the kind of procedures are depicted in Table 2. Mean operative time for the SEPS was 66.9 minutes (range 50 min to 80 min). Early post operative complications that were encountered include pain, hematoma, edema, surgical emphysema, bleeding and saphenous neuralgia. (Table 3). Wound infections were not seen in any case and there was no clinical evidence of thromboembolism within 1 month of the procedure. Clinical severity score was 1.7 post operatively after I month of SEPS. Fifteen patients (71%) patients become mobile within 8-12 hrs. of surgery while 6 patients become mobile after 24 hrs.(28.57%). Seventeen patients(85.3%) had early return to work within a week after surgery Mean hospital stay was 1.5days. Patients followed up after 2 week showed marked improvement in skin changes and ulcer healing. (Table 4) Almost all patients were satisfied with the procedure due to improvement in skin changes and ulcer healing, early mobility and early return to work and a better cosmetic result. At one month and 3 months follow up ulcers healing was 92.3% and 98% respectively in patients with active ulcers. No recurrence of ulcer seen and patients with skin changes and healed ulcers.

Table 1: Age & Gender Distribution of Patients

	Frequency	Percentage	Age (Mean±SD)
Male	19	90.47%	41.10±12.85
Female	2	9.52%	41.00±15.55

Table 2: Preoperative Evaluation of Patients

		Frequency	Percent
Diabetes	Yes	4	19.04%
Hypertension	Yes	2	9.52%
Obese	Yes	1	4.76%
Presenting Complaint	Skin changes with healed ulcers	8	38.09%
	Skin changes with active Venous ulcer	13	61.90%
	Pain	14	66.9%
Side	Right	11	52.38%
	Left	10	47.61%
Trendelburg Test	Positive	13	61.90%
	Negative	8	38.09%
Skin changes	Healed Ulcers	8	38.09%
	Venous Ulcers	13	61.90%
CEAP Classification	Skin changes C4	2	9.52%
	Healed ulcers C5	6	28.57%
	Active ulcers C6	13	61.90%
SF Function	Competent	8	38.09%
	Non competent	13	61.90%
Perforators	Present	21	100%
	Absent	0	0%
DVT	Yes	2	9.52%
Anesthesia	GA	8	38.09%
	Spinal	13	61.90%
Type of procedure	SEPS+Flush ligation of GSV	12	57.1%
	SEPS alone	9	42.8%
Perforated Clips	**3**	2	9.5%
	4	13	61.9%
	5	6	28.6%

Table 3: Post-operative complications

	Pain	Analgesic Requirement	Mobility	Return to Work	
Within 6-8 Hours	17(80.95%)	14(66.66%)	6(28.57%)	**5 Days**	7(33.33%)
Within 8-12 Hours	4(19.04%)	6(28.57%)	9(42.85%)	**7-10 Days**	14(52.38)
After 12 Hours	-	1(4.76%)	6(28.57%)	**After 2 Weeks**	3(14.3%)

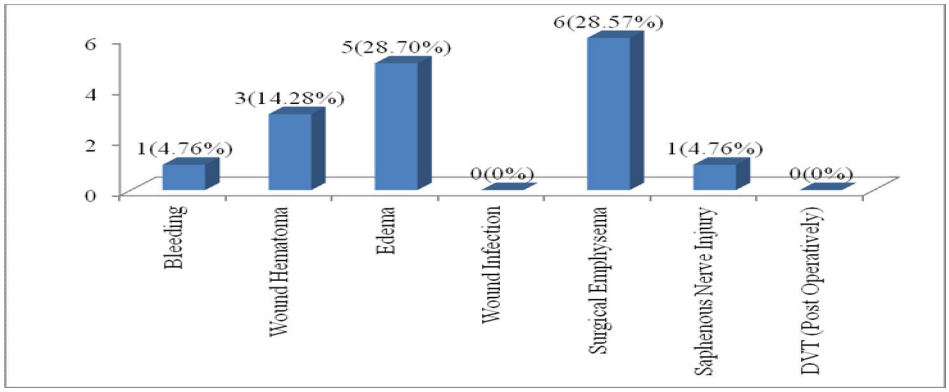

Table 4: FOLLOW UPS:

	Frequency	Percent
Pain after 2 Week	4	19.04%
Wound Infection after 2 Week	2	9.52%
Ulcer healing after 2 Week	08	61.5%
Ulcer healing after 1 Month	12	92.3%
Skin changes improvement	18	85.71%
Ulcer recurrence	0	0.0%
Patients Satisfaction	21	100%
Cosmesis	18	85.71%

Fig. 1:

DISCUSSION

The pathophysiology of CVI suggests that venous hypertension is linked to severe skin changes and ulceration. Furthermore, these changes can be favorably modified with ablation of superficial venous reflux[11,12] .Our working hypothesis is that if this is done in combination with interruption of calf perforating veins, the water-hammer effect of downward and outward venous flow through these vein will be halted, leukocyte trapping and activation decreased, and skin changes reversed [13] . Our early favorable observations of rapid ulcer healing, improvement in lipodermatosclerosis, and fading of hyperpigmentation appeared directly related to correction of perforating and superficial venous reflux by aggressive surgical intervention. Although pioneering work by Homans[14] , Linton[15] , Dodd and Cockett, [16] and others led to the development of effective surgical techniques for incompetent perforating vein ligation, these techniques are rarely used because of high wound complication rates and significant patient discomfort. These procedures require long incisions through skin and fascia that is already compromised by venous hypertension. Local wound complications, such as infection, skin necrosis and delayed healing, are seen in up to 58% of cases [17,18]. In addition, the role of the incompetent perforating vein in varicose veins and venous ulceration is uncertain and so there is controversy over the wisdom of performing perforator vein ligation at all. Uncontrolled data support the finding that ablation of superficial venous reflux together with multiple phlebectomies promotes wound healing and decreases ulcer recurrence[19] . SEPS was the only reliable way to correct pathologic outward flow in the perforating veins when there was persistent superficial reflux or coexistent deep venous reflux[20].

In our study,SEPS either alone or combined with flush ligation of GSV(great saphenous vein) as part of a comprehensive treatment plan for CVI, yielded good results in terms of ulcer healing and symptom relief. Preoperative duplex scan showed 13 of 21 limbs had perforating vein reflux , with a mean of 4 refluxing perforator veins per limb. Ulcers healing was 60% after 2 weeks and 90% after1 months in all 13 patients with active ulcers of

the limbs. 18 patients (85.7%) with either skin changes alone(CEAP 4) or with healed ulcers (CEAP 5) at the time of operation all reported symptomatic improvement. There was no new or recurrent ulcer formation during follow-up (mean, 3months). Our observed overall ulcer healing rate is similar to that of other reports. This nonrandomized interventional study suggests that SEPS either alone for incompetent perforating veins or combined with saphenous vein ablation is most advantageous in the setting of incompetent perforating veins and superficial venous reflux. It also appears to be beneficial when incompetent perforating veins are associated with deep venous reflux alone In the present experience there was no increase in complications in the SEPS without GSV flush ligation group, and outcome (healing and recurrence) was similar to that in limbs in which SEPS was combined with GSV flush ligation. Among the many reasons for trend towards SEPS are a combination of the advantages of minimal access surgery combined with low complication rates reported from uncontrolled case series. Pierik et al.[21] observed ulcer healing within 2 months after SEPS in all 16 patients with active venous ulceration. Only three infective complications were noted in 40 legs treated. Delayed wound healing has been reported in about 3% of cases an subfascial haematoma rates of approximately 3-6%[22]. Other reasons for this increase might well relate to the enthusiasm of surgeons to take up new techniques before evidence becomes available as to the relative merits of such procedures.A wide range of indications for fhis surgery have been found among surgeons currently practising SEPS. The perceived advantage of this procedure will probably result in an increase in the number of patients being operated upon for incompetent perforator veins. Because the morbidity associated with the SEPS operation appears to be significantly less than that of open surgical alternatives, the indications for surgery may be changing. This apparent improved risk-benefit ratio of surgical intervention combined with the long-term expense and inconvenience of compresive therapy, may lead to perforator surgery being offered to paticnts earlier in the course of their disease.

CONCLUSION

Sub-fascial Endoscopic Perforator Surgery is an effective, safe and feasible treatment of incompetent perforating veins in patients with advance chronic venous insufficiency. The favourable ulcer healing results and improvement in clinical symptoms suggest that SEPS play a vital role in treatment of venous ulcer. It leads to rapid ulcer healing and decreased morbidity.

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