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Sub Facial Endoscopic Perforator Surgery – In Varicose Ulceration

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I. INTRODUCTION

Varicose ulceration due to varicose veins of lower limbs is a long term disabling problem. Varicose ulcer is a breakdown of the skin overlying an area of poor local nutrition from blood stagnation in varicose veins. They tend to be very persistent unless the underlying cause is treated[12]. The development of varicose ulceration is attributed to incompetent perforators[11]. As per the clinical practice guidelines of society for vascular surgery and American venous forum there is indication to treat incompetent perforating veins in CEAP class C_3- C_6 disease[8]. But the management of complications of varicose veins due to incompetent perforators is still a challenge. Robert Linton emphasized the significance of incompetent perforating veins and developed an open technique for perforator ligation using a long medial sub fascial incision. In spite of many refinements to this open technique, wound infection[4] and delay in wound[7] healing has remained main disadvantages of this procedure due to the incisions given in unhealthy skin[2]. These disadvantages can be overcome by endoscopic technique for perforator ligation introduced by Hauer[3] in 1985. In sub fascial endoscopic perforator surgery, incisions are made in normal skin of the upper half of the leg thereby avoiding incisions in the area of compromised skin[2] to minimize wound complications. SEPS has shown to be technically feasible with minimal peri operative morbidity and shortened hospital stay[6,2]. In the present prospective study we present clinical outcome of SEPS in patients with varicose ulceration.

II. AIMS AND OBJECTIVES

Aim is to evaluate the efficacy of SEPS, in the treatment of varicose ulceration due to incompetent perforators.

III. METHODS

SEPS was performed in 36 legs in 33 patients from august 2009 to June 2015. 3 patients have undergone SEPS in both the limbs and 30 patients have undergone SEPS in one limb. Twelve of these patients have undergone SEPS as second procedure in the same leg due to non-healing of varicose ulceration. They had previously undergone SFJ ligation, stripping and multiple ligations. All the patients with signs and symptoms of perforator incompetence with CEAP grade 5, 6 were included in study. Patients with concomitant arterial disease or presence of deep vein thrombosis were excluded from the study. All the patients with varicose ulceration were submitted to conservative management (Bisgaard's method) for 3 weeks, prior to surgery. With this method infection was controlled and acute inflammation of the limb has subsided. Preoperative assessment included Colour Doppler study of arterial and venous system of lower limbs. Pre - operative marking of site of incompetent perforators clinically by Fegon's method and also by colour Doppler, is done a day before surgery.

All the 33 patients are males. Mean age of the patient is 46(varies from 30-70 years) years. Patients were classified according to CEAP classification. Active ulceration (CEAP class VI) was present in 32 limbs. 4 limbs had healed ulcers (class V). Twelve patients had undergone SFJ ligation, stripping of varicose vein in the thigh and multiple ligations of perforators in the leg previously but varicose ulceration has not healed.

Table1. Showing classification of patient's limbs (36) as per CEAP classification and their age

Age	No		CEAP classification		
	unilateral	bilateral		V	V1
30-40 years	8	1		2	8
41-50 years	8	2		2	10
51-60 years	9				9
60-70 years	5				5

IV. SURGICAL TECHNIQUE

SEPS was performed in spinal anaesthesia in all the patients. Prophylactic antibiotic inj. Cefataxime 1 gm was given intravenously just before giving the anaesthesia.

Tourniquet was applied to operating limb before draping. Tourniquet was applied in first 20 patients in the beginning of series but later it was not applied. Affected limb was prepared from groin to ankle and draped. Patient was placed in prone or lateral position according to location of incompetent perforators. Standard laparoscopic equipment was used. 11mm transverse incision was given in the posterior medial part of leg 10cm distal to the middle of popliteal fossa. Deep fascia was incised in the line of skin incision. 10mm trocar was passed through this incision into sub fascial plane and co2 insufflated. The insufflated pressure was maintained between 20-22mmof hg. This port was used as telescope port. Another 6mm incision was placed 5cm lateral and distal to first incision and a 5 mm trocar was passed. Through this, dissecting instruments were passed for dissection in sub fascial plane and identifying perforators. All perforators were identified and they were either cauterized or clipped depending on their size. After securing haemostasis, instruments were removed and incisions were closed. Tourniquet was released. Presences of concomitant disorders like SFJ/SPJ incompetence are dealt with accordingly. The elastic crepe compressive bandage was applied from toes to groin. Patients are ambulated the day after surgery and discharged on second postoperative day.

V. FINDINGS

It was not possible to detect the presence of all the perforators in 8 legs (22%) of CEAP grade V1 patients, clinically as well as by colour Doppler method.

In these 8 (22%) patients with non-healing of ulcers, Cockett's perforators were missed by both the methods and detected during SEPS. These patients had undergone surgery earlier.

The site of perforator marked clinically or with the help of Colour Doppler scan is not exactly matching during SEPS in 28 limbs. But found to be present 5cm around the vicinity of marking. 2-5 perforators were found in leg. Perforators in thigh and popliteal fossa are not counted as they are not dwelt with SEPS. The size of the perforators varies from 2mm to 3.5mm. The Cockett's perforator size varied from 3mm to 3.5mm.

VI. RESULTS

SEPS was performed in 36 limbs in 33 patients. Two patients with varicose veins in both the limbs had under gone SEPS in two sittings with gap of 8 days. The mean operating time was 60 (45-75) minutes. On an average 3 perforating veins per leg were coagulated. No serious intraoperative complication occurred.

3 months to 3 years of follow up was done. Decrease in pigmentation and edema was seen in 6 weeks and healing of ulcers was seen between 2- 12 weeks[5]. Varicose ulcer healed in all the patients. No patient had worsening of symptoms or ulceration after surgery and 3 ulcers recurred during follow-up. No post-operative wound infection was noticed.

Table 2 results of SEPS and duration of complete healing varicose ulcer

CEAP classification	No of (limbs)patients	Less than 2 weeks	2-4 weeks	4-12 weeks	More than 12 weeks
V	4		2	2	
V1	32	2	23	7	

VII. DISCUSSION

Varicose veins with complications cause major lifelong disability. The disease has complex pathogenesis in which superficial, deep and perforator system of veins are involved. The association of incompetent perforating veins with venous ulcers was observed in classic studies of Linton, Cockett and Dodd[6]. Zukowski and Nicolaides also confirmed that hemodynamic deterioration caused by incompetent perforators correlated with severity of chronic venous insufficieny[6]. In Rhodes and Gloviczki's report[9] 15 of the 17 patients

had developed recurrent varicose veins or varicose ulceration after high ligation of GSV and stripping. In our series also we had 12 patients with non-healing of varicose ulceration after GSV ligation, stripping and multiple ligations. In 8 of these patients Cockett's perforator was missed by colour Doppler also and varicose ulcer healed after ligating this perforator. It must be emphasized that all aspects of varicose veins should be addressed if success is to be anticipated and any procedure should be performed with careful selection.

Treatment of Incompetent perforators with complications is major challenge due to skin changes present over the incompetent perforator. Any incision over such skin results in production of another non healing or delayed healing ulceration. Location of incompetent perforator is not easy in CEAP grade 4, 5, 6 patients. With colour Doppler method also 2-3 incompetent perforators are likely to be missed[1,9] which may be the cause of recurrence of varicose ulceration. In our series also we had 8 patients with non-healing of varicose ulceration due to missed incompetent perforators.

Perforators can be seen easily through endoscopically, beneath the deep fascia.

In SEPS the above difficulties can be easily overcome as we are making the incisions in healthy skin in the upper part of leg proximal to the diseased portion of the leg and dissection is in subfascial plane to locate the perforators. There was no wound infection or wound gaping in our series compares well with other series[2] .

The perforators missed by clinical examination and by Doppler test also can be found by SEPS[2]. So all the perforators can be found and clipped or coagulated. Hence ulcer healing chances will be improved and recurrence chances can be decreased. Ulcer healing percentage is 100% in our series matches with the results of other series[2,11.] Recurrence was noted in 3 cases during follow up period. These 3 patients are in our first 10 patients. Our learning curve is the cause of this recurrence.

The technique was performed with standard laproscopic instruments and no other instruments were required. No significant intraoperative problem is encountered during surgery. The time of operation steadily decreased with practice. The main intraoperative problem was positioning of leg to achieve good exposure and optimal access for instruments.

The location of perforators found intraoperatively differed from preoperative marking of incompetent perforators. There was no postoperative mortality or significant morbidity that increases the hospital stay. No wound infection or wound dehiscence was reported as the approach to the site of incompetent perforators was through the normal skin as opposed to the incisions given through diseased skin in open procedure which has high incidence of wound infection and dehiscence.

VIII. CONCLUSIONS

We conclude that SEPS is a feasible and effective procedure for treatment of incompetent perforators of varicose veins with low morbidity and short hospital stays. Good results can be expected with proper patient selection, adequate preoperative work up including Doppler scan, meticulous dissection of subfascial plane and concomitant management of superficial varices. This procedure is of immense use if perforator incompetence is major cause of disease. More rapid healing of ulcers and long term freedom from ulcer recurrence can be expected.

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