

EVALUATION OF "SEPS" PROCEDURE IN THE MANAGEMENT OF PRIMARY VARICOSE VEINS WITH INCOMPETENT LOWER LIMB PERFORATOR

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ABSTRACT

BACKGROUND

Varicose veins affect at least 1 out of 5 in the world and the cost of health care for the society is significant. In a developing country like India, study encompassing the clinical evaluation and management of lower limb varicose veins on the conventional lines seems a necessity to improve the quality care with the available resources.

OBJECTIVES

To study the relation between site of incompetence and complications, pattern of complications, surgical management and its outcome for lower limb varicose veins.

METHODS

A total 26 number of patients with primary varicose veins admitted, investigated, operated and followed up. Final outcome evaluated. All the information was taken down in the proforma, designed for the study.

RESULTS

In the study, it was noted that the varicose veins affect younger, adult, and middle age population. (20 to 60 years). Majority of the patients were male (84.60%). Perforator incompetence only = 42.3% (n=11). Perforator incompetence + saphenofemoral/saphenopopliteal incompetence seen in 57.7%. Long saphenous vein involvement was seen in 90.5% of the patients and both LSV and SSV involvement in 9.5%. A greater portion of the patients had combined valvular incompetence (69.56%). The mean ulcer healing time in our study was 2.8 weeks following surgery (90%). Residual incompetent perforators are seen in 7.6% (n=2). New incompetent perforators seen in 7.6% (n=2). Postoperative wound infection of the incision of SPJ ligation was seen in 3.8% (n=1) of the patients, but not the SEPS wound infection and the total complication rate was 3.85%. The mean postoperative stay for patients undergoing SEPS procedure alone was 3.6 days. The mean postoperative stay for patients who underwent perforator ligation with concomitant stripping procedure was 5 days.

INTERPRETATION AND CONCLUSION

Majority of the patients present with complications of varicose vein with combined valvular incompetence and surgical treatment with stripping of path of incompetence (i.e. LSV trunk) appear to be best option for lower limb varicose vein with LSV truncal involvement under our settings. SEPS is a new, low risk, less postoperative stay, procedure that effectively decreases perforator reflux in patients with venous ulcerations, and should be added to our armamentarium to treat patients with advanced chronic venous disease.

KEYWORDS

Varicose veins, Varicosities, Telangiectasia, Spider vein, Vein disease, Chronic venous insufficiency, SEPS.

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INTRODUCTION: Venous ulceration is an uncomfortable, often painful and distressing medical condition that may result in a change in lifestyle, disability and loss of working days. Nonoperative management can usually heal the ulcer, but time to healing is frequently prolonged, adherence to compression treatment is cumbersome and in a warm

climate, wearing elastic stockings is annoying for many patients. Most importantly, ulcer recurrence remains an unsolved problem. Even in the best series using nonoperative management, ulcer recurrence at a mean followup of 30 months was 33% and all ulcers recurred in noncompliant patients.¹ In a study that followed results of nonoperative management using Unna boot and compression stockings in 99 limbs with venous ulcers, Erickson et al reported a 92% healing rate but a disappointing 56% ulcer recurrence. Frustration with nonoperative management led to the development of new surgical techniques to decrease venous reflux and improve

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chances of prolonged ulcer healing. Few operations in venous disease have attracted as much attention and controversy as subfascial endoscopic perforator surgery (SEPS). Division of incompetent perforating veins of the calf to treat patients with venous ulcers was first recommended by Robert Linton in 1938.¹ His procedure included a long skin incision made on the medial aspect of the leg to access all incompetent communicating veins that connect the superficial with the deep venous system. The original Linton operation to prevent reflux through incompetent perforators and to decrease ambulatory venous hypertension at the ankle area is rarely performed today. Wound complications, associated with the long skin incision made in diseased skin, were frequent and hospitalisation was prolonged. Therefore, variations of Linton's techniques were developed in subsequent years. These included the use of short longitudinal or transverse skin incisions to lessen the risk of wound complications, ligation of perforators above rather than under the fascia, or blind avulsion of the perforators by passing a shearing instrument in the subfascial space. While wound complications were fewer, these operations lacked adequate visual control and undoubtedly missed important incompetent perforating veins. Endoscopic techniques have clear advantages because they improve visual control of perforator interruption, decrease wound complications and shorten hospital stay. A prospective randomised study that compared SEPS with the classic, open perforator ligation was reported recently.

AIMS OF THE STUDY: To study the effectiveness of SEPS (subfascial endoscopic perforator surgery procedure) in primary varicose vein.

To study the results and the incidence of various complications after the SEPS procedure.

MATERIALS AND METHODS: This prospective study is based on the analysis of 26 cases of varicosities of the lower limbs with perforator incompetence with or without saphenofemoral incompetence. The patients were treated with perforator ligation alone with the SEPS method or in combination with the flush ligation. The study was conducted in the period between August 2009 and June 2011 in the Upgraded Department of Surgery at Osmania General Hospital, Hyderabad.

Inclusion Criteria: Patients with primary varicosities of the great or small saphenous system with perforator incompetence of the leg with or without saphenofemoral or saphenopopliteal incompetence were included in the study.

Exclusion Criteria: Patients with varicose veins not having perforator vein incompetence (those with saphenofemoral or saphenopopliteal incompetence only) were not included in the study. Patients with deep venous thrombosis were excluded from the study.

RESULTS:

| Gender | Number of patients | Percentage |
|--------------|--------------------|-------------|
| Male | 22 | 84.6% |
| Female | 4 | 15.4% |
| Total | 26 | 100% |

Table 1

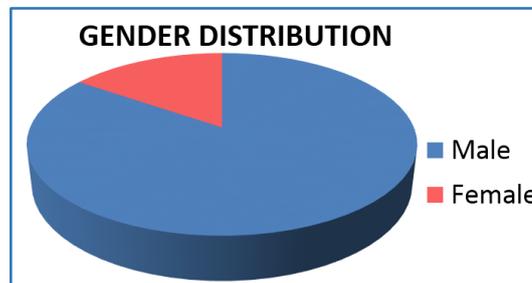


Fig. 1

| Side involved | Number of patients | Percentage |
|-------------------|--------------------|------------|
| Right lower limb | 12 | 46.2% |
| Left lower limb | 13 | 50% |
| Bilateral disease | 1 | 3.8% |

Table 2

| Pathology | Number of patients | % |
|--|--------------------|-------|
| Perforator incompetence only | 11 | 42.3% |
| Perforator incompetence + saphenofemoral/saphenopopliteal incompetence | 15 | 57.7% |

Table 3

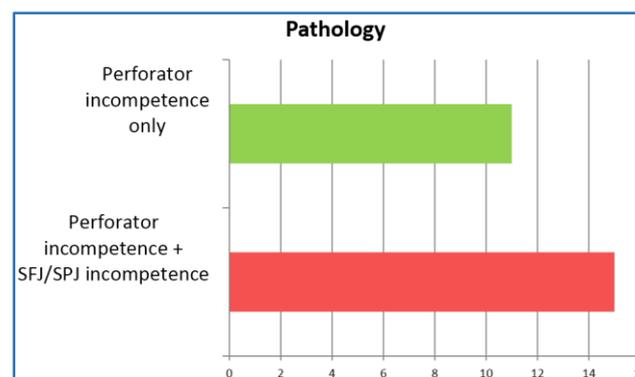


Fig. 2

| Clinical classification | Number of patients | Percentage |
|-------------------------|--------------------|------------|
| C1 | 0 | 0% |
| C2 | 4 | 15.4% |
| C3 | 3 | 11.5% |
| C4 | 7 | 26.9% |
| C5 | 3 | 11.5% |
| C6 | 9 | 34.7% |

Table 4

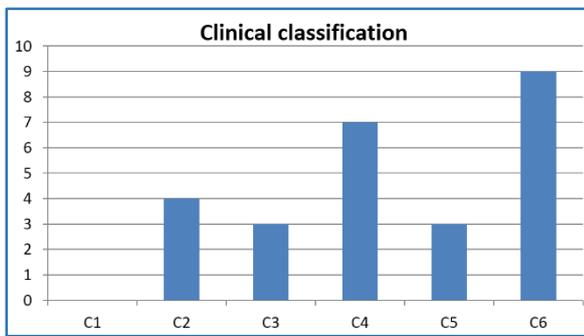


Fig. 3

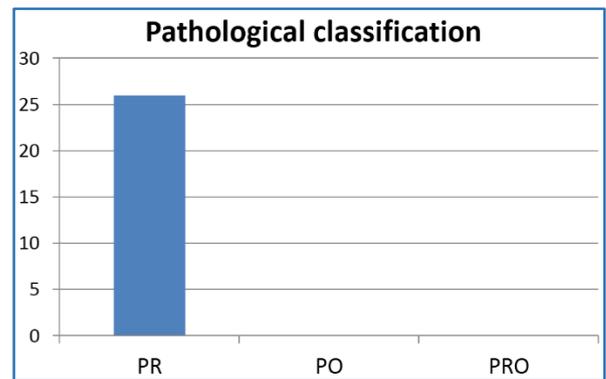


Fig. 6

| Etiological classification | Number of patients | Percentage |
|----------------------------|--------------------|------------|
| EC | 0 | 0% |
| EP | 26 | 100% |
| ES | 0 | 0% |

Table 5

| Surgery done | Number of patients |
|---|--------------------|
| Perforator ligation alone | 11 |
| Perforator ligation + stripping ± ligation of saphenopopliteal junction | 15 |

Table 8

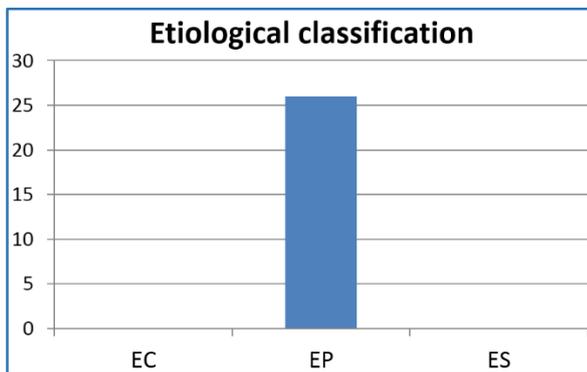


Fig. 4

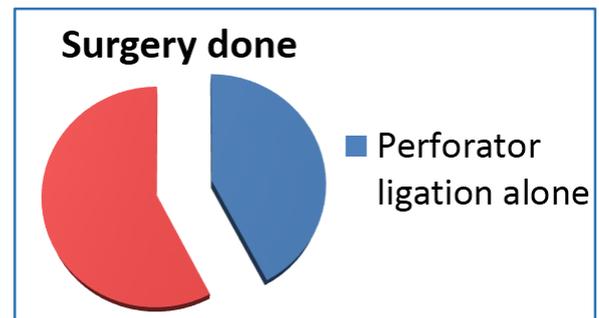


Fig. 7

| Anatomical classification | Number of patients | Percentage |
|---------------------------|--------------------|------------|
| AS | 0 | 0% |
| AP | 11 | 42.3% |
| ASP | 15 | 57.7% |

Table 6

| Average Hospital Stay | Days |
|---|------|
| Perforator ligation alone | 3.65 |
| Perforator ligation + stripping ± ligation of saphenopopliteal junction | 4.93 |

Table 9

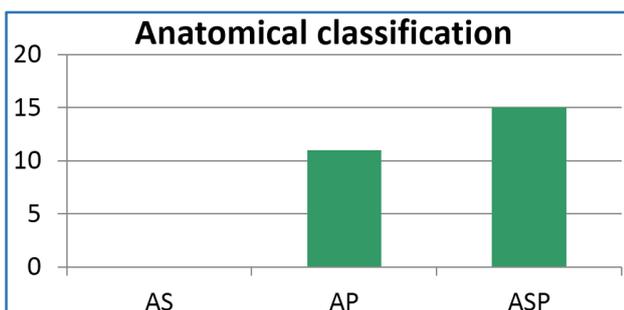


Fig. 5

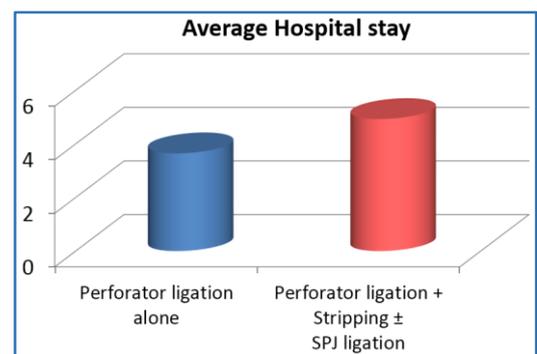


Fig. 8

| Pathological classification | Number of patients | Percentage |
|-----------------------------|--------------------|------------|
| PR | 26 | 100% |
| PO | 0 | 0% |
| PRO | 0 | 0% |

Table 7

| Ulceration | Number of patients |
|-------------------------------------|--------------------|
| Total patients with varicose ulcers | 10 |
| Healed ulcers in 12 weeks | 9 |
| Ulcers not healed in 12 weeks | 1 |
| Ulcer healing rate | 90% |

| | |
|----------------------|-----------|
| Minimum healing time | 6 Days |
| Maximum healing time | 6 Weeks |
| Average healing time | 2.8 Weeks |
| Table 10 | |

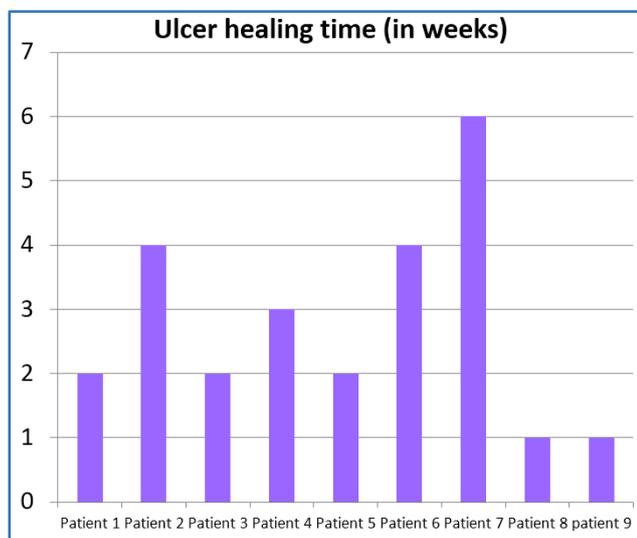


Fig. 9

| Complications of surgery | Number of patients | Percentage |
|----------------------------------|--------------------|------------|
| New perforator incompetence | 2 | 7.7% |
| Residual perforator incompetence | 2 | 7.7% |
| Wound infection | 0 | 0% |
| Delayed wound healing | 0 | 0% |
| Hematoma | 0 | 0% |
| Nerve palsy | 0 | 0% |
| Flap necrosis | 0 | 0% |
| Table 11 | | |

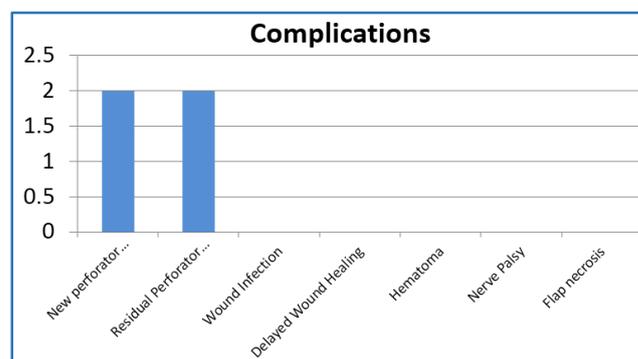


Fig. 10



Intraoperative photos of 'SEPS'

DISCUSSION: The present study assesses the role of subfascial endoscopic perforator surgery in the management of perforator incompetence of the lower limb veins and the various complications of the surgery in the postoperative period.

A total of 26 patients underwent the SEPS procedure in the Osmania General Hospital, Hyderabad from August 2009 to June 2011. Preoperative workup was done as mentioned before.

Of the 26 patients who underwent the procedure, 22 were men and 4 were women. This gross male preponderance is because of social reasons due to which less number of women seek medical intervention for this problem.

The average age of the patients who underwent operation was 43 years. Left lower limb was affected in 13 patients and right limb was involved in 12 cases and bilateral disease was seen in 1 patient.

Of the patients operated, 42.3% (n=11) had only perforator incompetence and 57.7% (n=15) had either saphenofemoral or saphenopopliteal incompetence in addition to perforator incompetence.

Of the patients with superficial vein disease (n=15), 4 patients had reflux at both the saphenofemoral and saphenopopliteal junction, one patient had saphenopopliteal incompetence and 10 patients had only saphenofemoral incompetence.

Four of the patients had varicosities of the lower limb without skin changes (C2), three patients had oedema of the leg and ankle (C3) and seven patients had skin changes in the form of pigmentation, eczema, lipodermatosclerosis, etc. (C4). Three patients had healed ulceration (C5) and nine patients had active ulceration (C6). Active ulcers which were infected and with slough were preoperatively managed with debridement and daily dressings till the infection came down and the ulcer floor was covered with healthy granulations.

The patients with isolated perforator incompetence were treated with the SEPS procedure whereas the patients with concomitant saphenofemoral incompetence underwent stripping operation in addition to subfascial ligation.

Postoperatively, patients were followed up on outpatient basis once every week for 4 weeks, once every 2 weeks up to 12 weeks and then once in a month. They were assessed for complications of surgery, ulcer healing times and residual perforator incompetence and new incompetent perforator.

In our study, postoperative wound infection of the incision of SPJ ligation was seen in 3.8% (n=1) of the patients, but not the SEPS wound infection. Residual incompetent perforators are seen in 7.6% (n=2). New incompetent perforators seen in 7.6% (n=2). In our study, postoperative wound infection of the incision of SPJ ligation was seen in 3.8% (n=1) of the patients, but not the SEPS wound infection. In no patients, air embolism, wound haematoma or nerve palsy was seen. The total complication rate was 3.85%. The complication rate described in various studies for the subfascial ligation procedure with a long incision ranges from 12% to 53%. Stuart et al² reported that calf wound complications occurred in seven patients (19%) and the average hospital time was nine days. Sato et al³ reported a 45% local wound complication rate for the subfascial ligation procedure. Bowen et al⁴ reported a 44% wound infection rate in patients undergoing open perforator surgery in a randomised trial comparing Cockett and Dodd⁵ procedure with SEPS.

In our study, wound infection and nonhealing rates were comparable to that mentioned in literature. In a study that followed results of nonoperative management using Unna boot and compression stockings in 99 limbs with venous ulcers, Erickson et al reported a 92% healing rate but a disappointing 56% ulcer recurrence.

The mean ulcer healing time in our study was 2.8 weeks following surgery. Earliest healing time was 6 days and the longest time was 6 weeks. Ulcer healing time quoted in literature ranges from 2 to 6 weeks, the average being 35 days. Negus and Friedgood⁶ in a study of varicose ulcers in 108 patients reported an ulcer healing time of 17 days and healing rate of 84% with open subfascial ligation. Cikrit et al⁷ reported an ulcer healing rate of 72% with an average healing time of 6 weeks in a study of 32 patients with varicose veins of which 30 had active ulceration. Of the patients with active ulcers, ulcers healed in 8 patients within 6 weeks. One patient had persistence of ulcer needing skin grafting for healing. Ulcer healing rate in our study was 90% which is comparable to other studies.

| Study | Average ulcer healing time | Ulcer healing rate |
|----------------------------------|----------------------------|--------------------|
| Negus and Friedgood ⁶ | 2.5 weeks | 84% |
| Cikrit et al ⁷ | 6 weeks | 72% |
| Our study | 2.8 weeks | 90% |

Table 12

Residual perforator incompetence was seen in 7.7% (n=2) of the total patients operated. In both the cases, the

perforators in the lower calf and ankle were showing persistent incompetence in the postoperative duplex study showing that they were the ones that were missed during surgery. This might be due to inadequate exposure and technical problems. Accurate preoperative marking of the sites of incompetent perforators and a thorough intraoperative search should prevent such persistence of perforator incompetence.

The mean postoperative stay for patients undergoing SEPS procedure alone was 3.6 days. The mean postoperative stay for patients who underwent perforator ligation with concomitant stripping procedure was 5 days. Stuart et al² reported an average hospital stay of 9 days for patients undergoing open perforator ligation.

Long term followup was not possible in this study due to patient factors. Hence we were unable to study the ulcer recurrence rate. A study by Negus showed that 84% of the patients were free of ulcerations 6 years after the open perforator ligation procedure.⁶

Many studies have compared the open subfascial perforator ligation with SEPS procedure. Pierok et al⁸ reported an overwhelming 53% of wound infection rate with open perforator ligation whereas no wounds (0%) were infected in the SEPS group. Sybrandy et al⁹ compared open perforator ligation with SEPS and concluded that ulcer healing rates and recurrence rates were similar with both the procedures. Therefore, ulcer healing rates achieved with SEPS are equal to that of the open procedure, but the wound complication rate is much lesser with SEPS.

CONCLUSIONS: Subfascial endoscopic perforator surgery is a useful procedure in treatment of patients with primary varicose veins with perforator incompetence.

The most feared local wound complications of the procedure can be prevented by careful patient selection, meticulous operative technique and assiduous postoperative care. With these precautions, the wound complications can be minimised and acceptable results can be achieved.

Open perforator ligation has an important role in treatment of venous ulcers with our study showing 88% ulcer healing rates within 12 weeks of the procedure.

Open perforator ligation (Linton's or Cockett and Dodd's) has been largely replaced by SEPS procedure in many centres around the world. But, in places where the equipment or expertise for performing SEPS is not available, Cockett and Dodd's procedure remains a viable alternative for perforator ligation.

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