

The Role of Subfascial Ligation of Perforator Veins By Cockett And Dodd Method in the Treatment of Varicose Veins

Dr.S.Naresh Kumar¹,Dr.M.Shirisha²

^{1,2}dept. Of General Surgerydept.Of General Surgery Esic Medical College &Hospital Esic Medical College & Hospital Hyderabadhyderabad

Abstract

Aims And Objectives

1. To study the role of Cockett and Dodd operation of subfascial ligation of below knee perforator veins in the treatment of varicose veins of the lower limb.
2. To study the results and the incidence of various complications after the Cockett and Dodd operation.

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 Cockett and Dodd method or in combination with the stripping procedure. The study was conducted in the period between August 2014 and August 2015.

Results: A total of 26 patients underwent the Cockett and Dodd procedure in the MEDICITI INSTITUTE OF Medical Sciences from August 2014 to August 2015 Of the 26 patients who underwent the procedure, 23 were men and 3 were women 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. The patients with isolated perforator incompetence were treated with the Cockett and Dodd procedure whereas the patients with concomitant saphenofemoral incompetence underwent stripping operation in addition to subfascial ligation In our study, postoperative wound infection of the long posterior leg incision was seen in 11.5% (n=3) of the patients. Delayed wound healing without infection was seen in 3.8% (n=1). In no patients, wound hematoma or nerve palsy (motor or sensory neuropathy) was seen In our study, wound infection and non healing rates were less than the described in literature. This is probably the result of careful patient selection The mean ulcer healing time in our study was 3.11 weeks following surgery . Earliest healing time was 6 days and the longest time was 8 weeks. Ulcer healing time quoted in literature ranges from 2 to 6 weeks the average being 35 days The mean postoperative stay for patients undergoing Cockett and Dodd procedure alone was 5.4 days. The mean postoperative stay for patients who underwent perforator ligation with concomitant stripping procedure was 8.2 days

Conclusion: Cockett and Dodd procedure of open subfascial perforator ligation 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 minimized and acceptable results can be achieved. Open perforator ligation has an important role in treatment of venous ulcers with our study showing 100% ulcer healing rates within 8 weeks of the procedure.

I. Introduction

The great Indian surgeon of antiquity, Sushruta, offered the first recorded description of varicose veins. In the second volume of his samhita, he discussed siragranthi or “aneurysms of veins” 1 . Since antiquity, reports on varicose veins of lower limbs have been found, as documented in Ebers papyrus, during the rule of Amenhotep I (1550 B.C.). In ancient Greece, lower limb replicas were offered to gods in temples to obtain relief of symptoms. Also much has been written on the surgical treatment of varicose veins. There are reports of Hippocrates (460377 B.C.) cauterized varicose veins with a hot iron rod. Hippocrates also mentions in his works, with great frequency venous disease of lower limbs.2Many contributed to development for the development of new treatment modalities. Porter and Moneta classified varicose veins into seven classes according to the clinical signs, severity and disability rating scales.3 Varicose veins are defined as dilated usually tortuous, subcutaneous veins >3 mm in diameter measured in upright position with demonstrable reflux.4 Varicose veins are part of the penalty we pay for the erect posture.4 Varicose veins affects 25-30% female population and 15% in men.4 Risk factors for the development of varicose veins include advancing age, female gender, heredity and history of trauma to the extremity.5 Varicose veins frequently cause symptoms, the most common being aching or heaviness, which typically increases throughout the day. Other symptoms include ankle swelling and itching.4 Cutaneous burning sensation termed as “venous neuropathy” can also occur in

patients with advanced venous insufficiency.⁵ The findings of varicose veins may include dilated, tortuous veins, telangiectasis and fine reticular varicosities.⁵ In varicose veins, the problem may lie in superficial venous system, deep venous system or perforating system. If the incompetent perforators are not properly localized and ligated they may complete the circuit of varicose veins draining blood from deep to superficial venous system there by leading to recurrence.⁶ The aim of the clinical examination is to localize the site of incompetence whether superficial or deep venous system. If it is superficial system then whether the problem is in sapheno femoral or sapheno popliteal junction or at perforator level. Various tests are done for this purpose like Brodie-Trendelenburg test, Tourniquet test, Perthe's test, Schwartz test, Pratt's test and Fegan's test. These clinical tests should be combined together with diagnostic modalities like Duplex ultrasound imaging increases the sensitivity and specificity to exactly identify the incompetent sites and surgery can be performed by small incisions and allow for better and early wound healing and also can prevent recurrence of the disease.⁷ Although mortality due to varicose veins is very minimal but morbidity causes much misery and suffering as it occurs in prime time of life. As can be expected there is enormous loss of man power and productivity. Interestingly this disease has an effective treatment.

II. 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 Cockett and Dodd method or in combination with the stripping procedure. The study was conducted in the period between August 2014 and August 2015 in the Upgraded department of Surgery at Mediciti Institute Of Medical Sciences .

Inclusion criteria:

Patients with primary varicosities of the great or small saphenous system with perforator incompetence of the leg 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.

III. Observation & Results

Data analysis

Gender distribution

Gender	Number Of Patients	Percentage
Male	23	88.4%
Female	3	11.6%
Total	26	100%

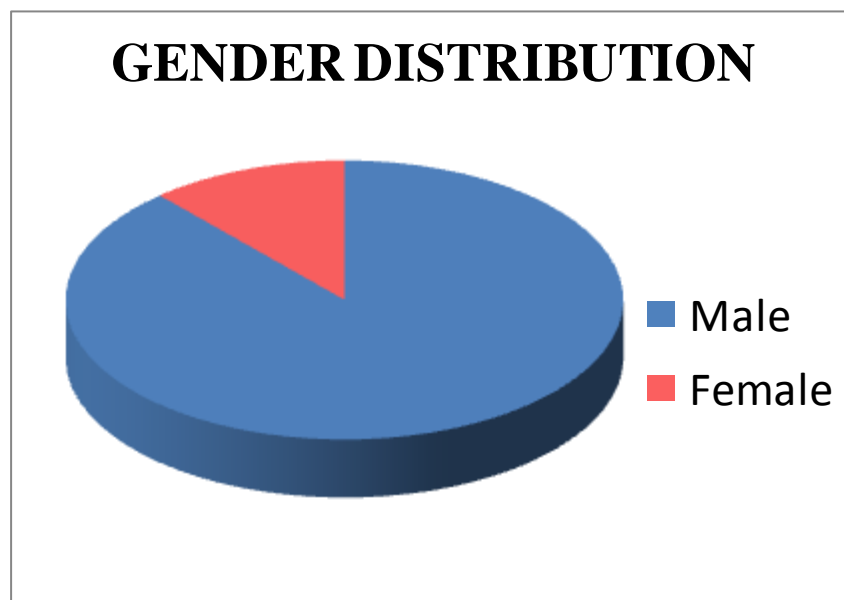


Chart-1

Side Involved

Side Involved	Number Of Patients	Percentage
Right Lower Limb	12	46.2%
Left Lower Limb	13	50%
Bilateral Disease	1	3.8%

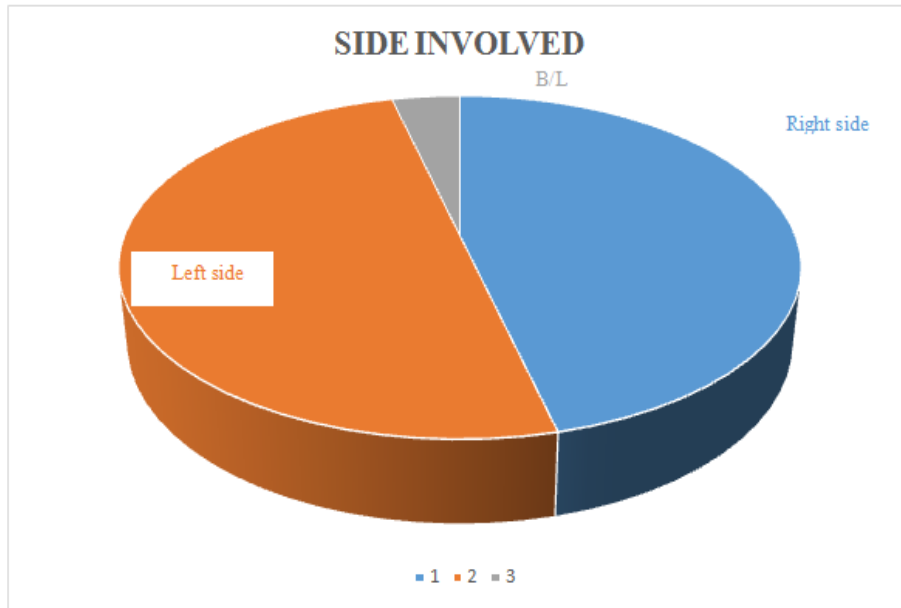


Chart-2

Pathology

Pathology	Number Of Patients	Percentage
Perforator Incompetence Only	11	42.3%
Perforator Incompetence + Saphenofemoral/Saphenopopliteal Incompetence	15	57.7%

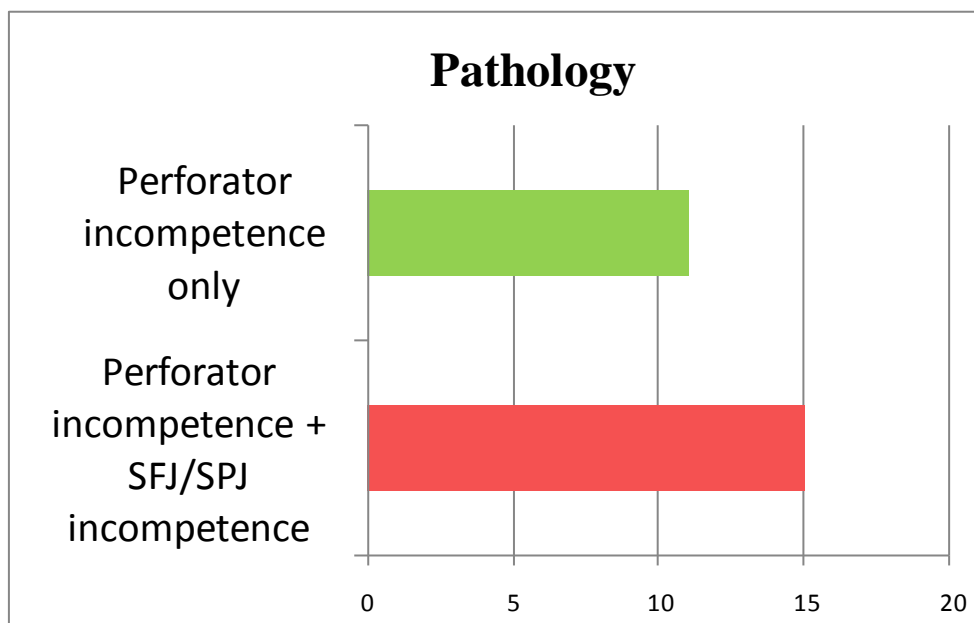
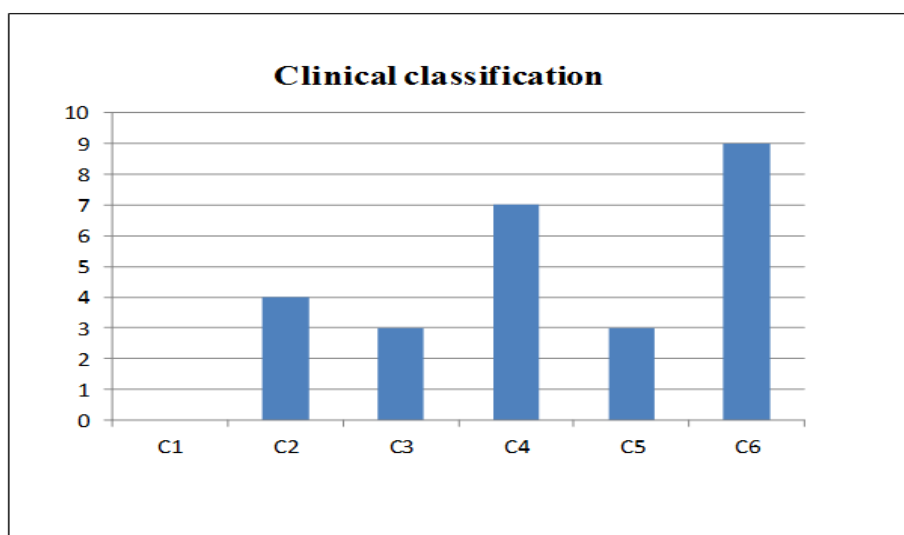


Chart-3

Clinical Classification

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%

Chart-4



Etiological Classification

Etiological Classification	Number Of Patients	Percentage
Ec	0	0%
Ep	24	100%
Es	0	0%

Etiological classification

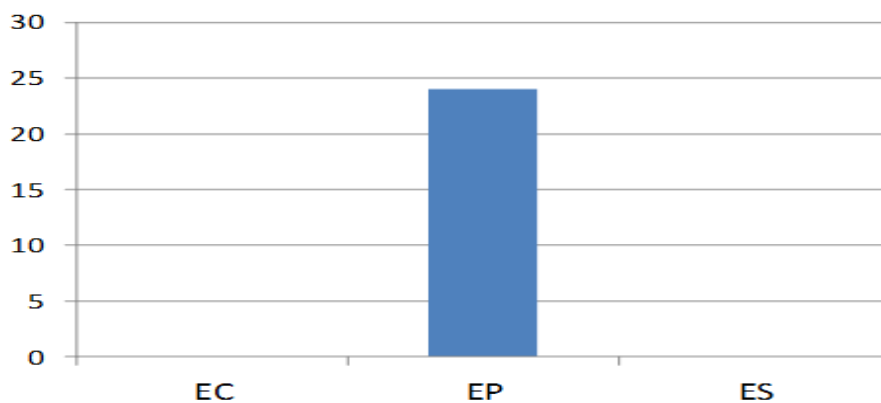


Chart-5

Anatomical Classification

Anatomical Classification	Number Of Patients	Percentage
As	0	0%
Ap	11	42.3%
Asp	15	57.7%

Anatomical classification

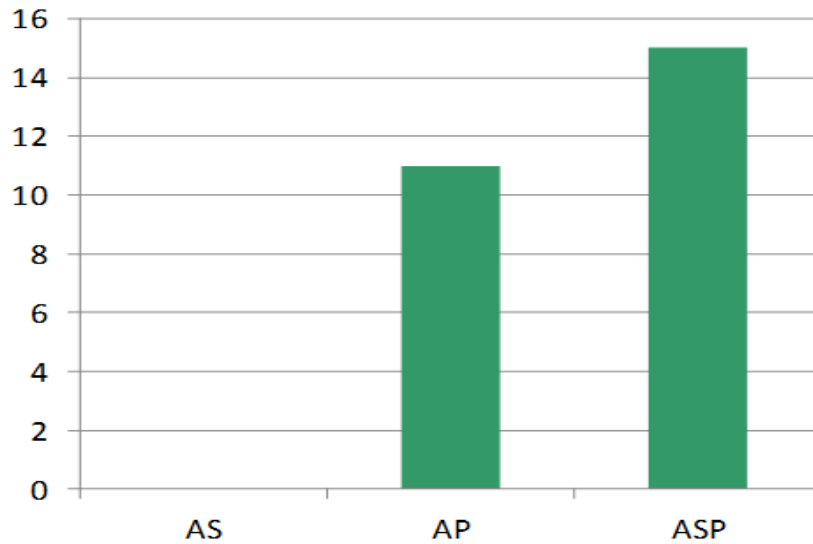


Chart-6

Pathological Classification

Pathological Classification	Number Of Patients	Percentage
Pr	26	100%
Po	0	0%
Pro	0	0%

Pathological classification

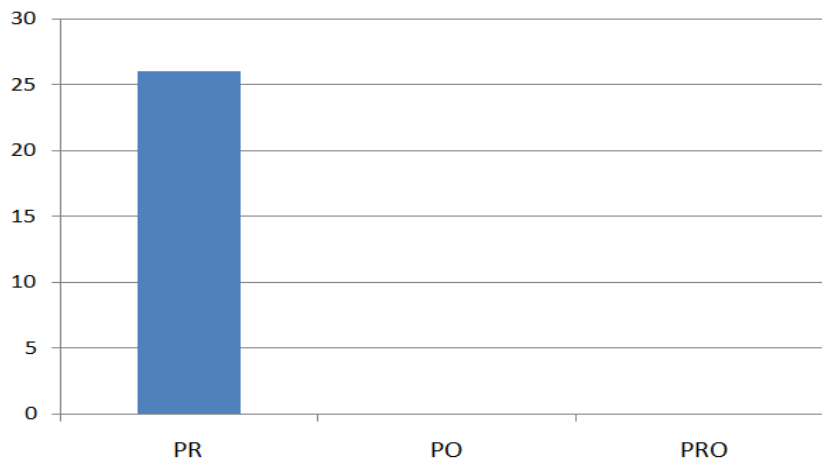


CHART-7

Surgery Done

Surgery Done	Number Of Patients
Perforator Ligation Alone	11
Perforator Ligation + Stripping ± Ligation Of Saphenopopliteal Junction	15

Surgery done

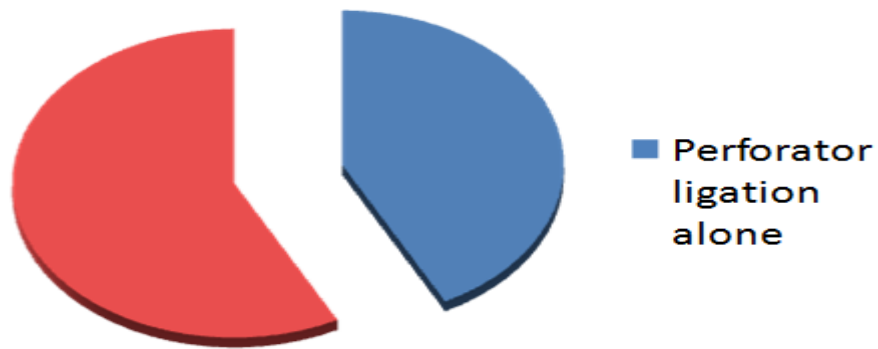
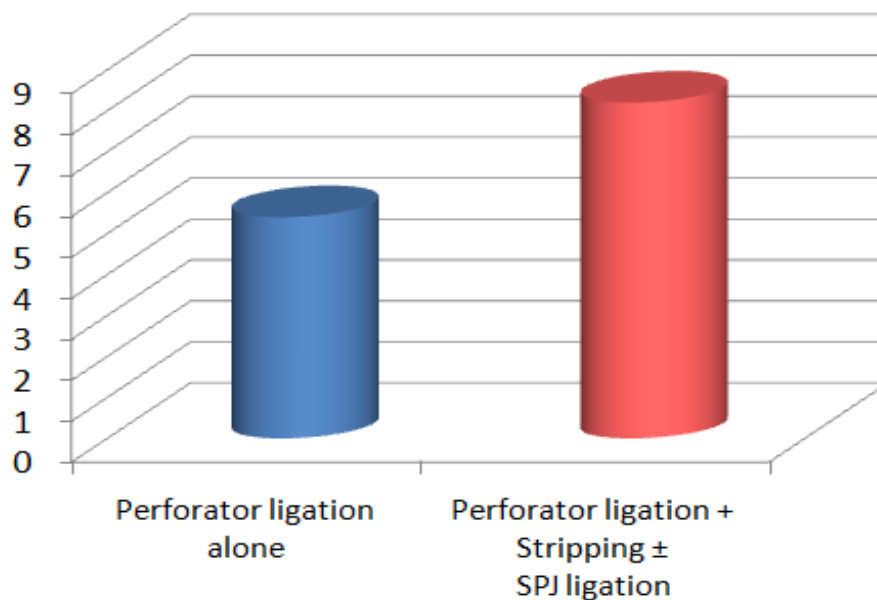


CHART-8

Average Hospital Stay

Average Hospital Stay	Days
Perforator Ligation Alone	5.4
Perforator Ligation + Stripping ± Ligation Of Saphenopopliteal Junction	8.2

Average Hospital stay



Ulcer Healing Time

Ulceration	Number Of Patients
Total Patients With Varicose Ulcers	9
Minimum Healing Time	6 Days
Maximum Healing Time	8 Weeks
Average Healing Time	3.11 Weeks

Ulcer healing time (in weeks)

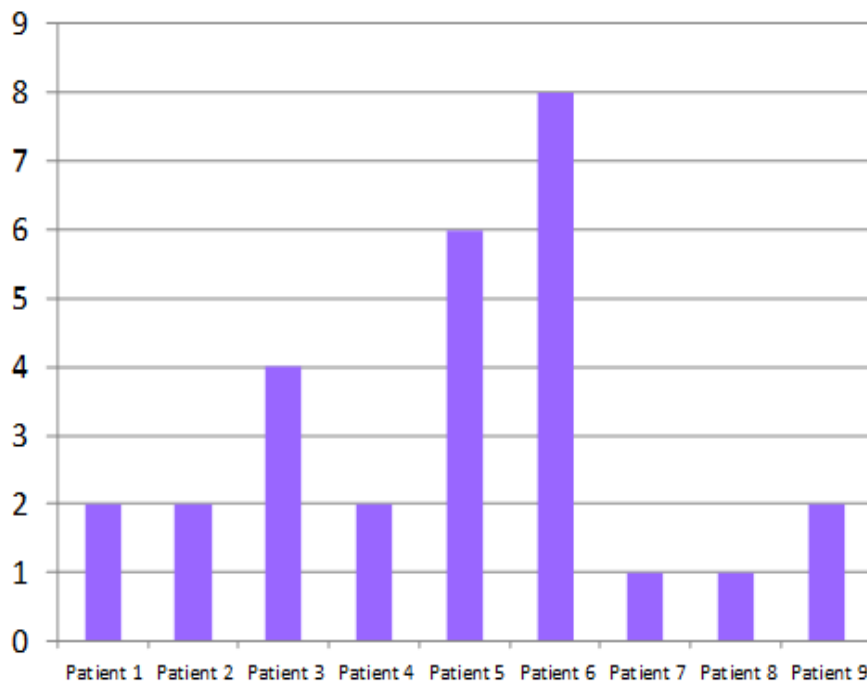


CHART-10

Complications Of Surgery

Complications Of Surgery	Number Of Patients	Percentage
Residual Perforator Incompetence	2	7.7%
Wound Infection	3	11.5%
Delayed Wound Healing	1	3.8%
Hematoma	0	0%
Nerve Palsy	0	0%

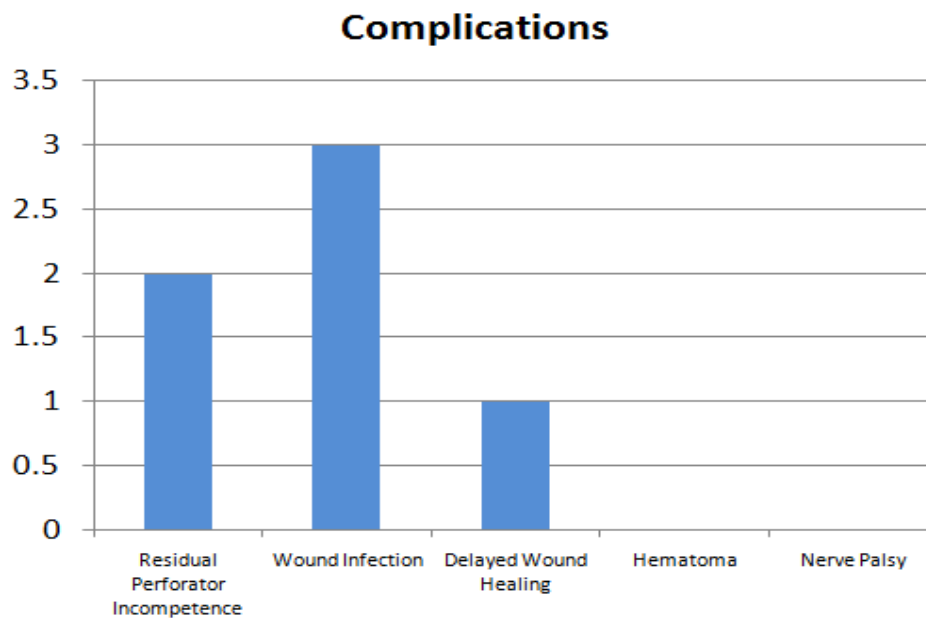


CHART-11

IV. Discussion

The present study assesses the role of Cockett and Dodd's perforator ligation 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 Cockett and Dodd procedure in the MEDICITI INSTITUTE OF MEDICAL SCIENCES from August 2014 to August 2015. Of the 26 patients who underwent the procedure, 23 were men and 3 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 45years. 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), 3 patients had reflux at both the saphenofemoral and saphenopopliteal junction and 12 patients had only saphenofemoral incompetence.

Four of the patients had varicosities of the lower limb without skin changes (C2), three patients had edema 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 Cockett and Dodd procedure whereas the patients with concomitant saphenofemoral incompetence underwent stripping operation in addition to subfascial ligation. Patients with concomitant saphenopopliteal incompetence underwent ligation of the saphenopopliteal junction. Postoperatively, patients were followed up on outpatient basis once every 2 weeks for a maximum of 12 weeks and were assessed for complications of surgery, ulcer healing times and residual perforator incompetence.

In our study, postoperative wound infection of the long posterior leg incision was seen in 11.5% (n=3) of the patients. Delayed wound healing without infection was seen in 3.8% (n=1). The patient with delayed healing of the wound had lipodermatosclerosis of the lower leg where the incision was placed. In no patients, wound hematoma or nerve palsy (motor or sensory neuropathy) was seen. The total complication rate was 15.3%. The complication rate described in various studies for the subfascial ligation procedure with a long incision ranges from 12% to 53%⁸. Stuart et al⁹ reported that calf wound complications occurred in seven patients (19%), and the average hospital time was nine days. Sato et al reported a 45% local wound complication rate for the subfascial ligation procedure¹⁰. Bowen et al reported a 44% wound infection rate in patients undergoing open perforator surgery in a randomized trial comparing Cockett and Dodd procedure with SEPS.

In our study, wound infection and non healing rates were less than the described in literature. This is probably the result of careful patient selection. Wounds in lipodermatosclerotic limbs tend towards non healing

than incisions given in healthy skin. This could be a contributory factor in the wide variation of complication rates seen.

The mean ulcer healing time in our study was 3.11 weeks following surgery. Earliest healing time was 6 days and the longest time was 8 weeks. Ulcer healing time quoted in literature ranges from 2 to 6 weeks the average being 35 days. Negus and Friedgood¹² 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 al¹³ reported an ulcer healing rate of only 30% with an average healing time of 6 weeks in a study of 32 patients with varicose veins of which 30 had active ulceration.

Residual perforator incompetence was seen in 7.7% (n=2) of the total patients operated. In both the cases, the perforators in the below knee region 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 of the incision up to the popliteal fossa. 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 Cockett and Dodd procedure alone was 5.4 days. The mean postoperative stay for patients who underwent perforator ligation with concomitant stripping procedure was 8.2 days. Stuart et al reported an average hospital stay of 9 days for patients undergoing open perforator ligation. Long term follow up was not possible in this study due to patient factors. Hence we were unable to study the ulcer recurrence rate. But studies show that patients who underwent open perforator ligation were free from ulcer recurrence for more than 5 years follow up. A study by Negus showed that 84% of the patients were free of ulcerations 6 years after the open perforator ligation procedure¹⁴.

Many studies have compared the open subfascial perforator ligation with SEPS procedure. Pierek et al¹⁵ reported an overwhelming 53% of wound infection rate with open perforator ligation whereas no wounds (0%) were infected in the SEPS group. Sybrandy et al compared open perforator ligation with SEPS and concluded that ulcer healing rates and recurrence rates were similar with both the procedures¹⁶. 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. However, the expertise and equipment required for the performance of SEPS is not yet widely available. The economical and technical feasibility of SEPS procedure is still very less especially in the non institutional setting in our country.

V. Conclusions

Cockett and Dodd procedure of open subfascial perforator ligation 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 minimized and acceptable results can be achieved. Open perforator ligation has an important role in treatment of venous ulcers with our study showing 100% ulcer healing rates within 8 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.

Bibliography

- [1]. Steven G. Friedman. A History of Vascular Surgery Book: venous surgery. 2 nded. Massachusetts, USA: Wiley/Blackwell future; 2005. P 147-158.
- [2]. Royle J, Somjen GM; Varicose veins: Hippocrates to Jerry Moore. ANZ J Surg. 2007 dec; 77(12): p 1120-7.
- [3]. Porter JM and Moneta GL. Reporting standards in venous disease: An update international consensus committee on chronic venous disease. J. Vasc Surg. 1995 Apr; 21(4): p 635-645
- [4]. Norman S. Williams, Christopher J.K Bulstrode, P. Ronan O'Connell. Bailey and Love's Short Practice of Surgery: Venous disorders. 26th ed. Boca Raton, London, New York: CRC Press; 2013.p 927-940.
- [5]. Courtney M. Townsend Jr, R. Daniel Beauchamp, B. Mark Evers, Kenneth L. Mattox. Sabiston Textbook of Surgery The Biological Basis of Modern Surgical Practice: venous disease. 19th ed, Philadelphia: Saunders Elseiver; 2012. p 1801-1816.
- [6]. Cavezzi A., Labropoulos N., Partsch H., Ricci S., Caggiati A., Myers K., Nicolaidis A. and Smith PC. Duplex ultrasound investigation of veins in chronic venous disease of the lower limbs- UIP consensus document.part II, Anatomy. EurJ.VascEndovasc surg. 2006 Mar; 31(3): p 288-99.
- [7]. Caggiati A., Bergan JJ, Gloviczki P., Janet G., Wendell – Smith CP. and Partsch H. Nomenclature of the veins of the lower limbs: an International Interdisciplinary Consensus statement. J vasc surg. 2002 Aug; 36(2): p 416-22.
- [8]. Rutherford Vascular Surgery, 6th edn, Elsevier Saunders, 2005
- [9]. Stuart WP, Asam DJ, Bradbury AW, Ruckley CV. Subfascial endoscopic perforator surgery is associated with significantly less morbidity and shorter hospital stay than open operation, Br J Surg. 1997. 84: 1364–1365.
- [10]. Sato DT, Goff CD, Gregory RT, Walter BF, Gayle RG, Parent FN III et al. Subfascial perforator vein ablation: Comparison of open versus endoscopic techniques, J Endovasc Surg. 1999. 6: 147–154.
- [11]. Bowen FH: Subfascial ligation of the perforating leg veins to treat post-thrombophlebitic syndrome. Am Surg 1975; 41:148-151.
- [12]. Negus D, Friedgood A: The effective management of venous ulceration. Br J Surg 1983; 70:623-627.
- [13]. Cikrit DF, Nichols WK, Silver D: Surgical management of refractory venous stasis ulceration. J VascSurg 1988; 7:473-478.
- [14]. Negus D: Leg Ulcers: A Practical Approach to Management, 2nd ed. Oxford, Butterworth-Heinemann, 1995.

- [15]. Pierik EG, van Urk H, Hop WC, Wittens CH: Endoscopic versus open subfascial division of incompetent perforating veins in the treatment of venous leg ulceration: A randomized trial. *J VascSurg* 1997; 26:1049-1054.
- [16]. Sybrandy JE, van Gent WB, Pierik EG, Wittens CH: Endoscopic versus open subfascial division of incompetent perforating veins in the treatment of venous leg ulceration. *J VascSurg* 2001; 33:1028-1032.