

## A RETROSPECTIVE COMPARISON ON SURGICAL MANAGEMENT OF VARICOSE VEINS WITH AND WITHOUT VENOUS STRIPPING

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### Abstract

**Background:** Varicose veins are dilated, elongated and tortuous veins. Though not a very fatal disease, the morbidity caused by this disease is more. So far as the etiology is concerned varicose veins mostly occur due to incompetence of their valves. It may also be secondary, predisposed by any obstruction which hampers venous return like abdominal tumors, pregnancy, ascites, retroperitoneal fibrosis etc. The treatment modalities available are conservative, surgical and Endovenous therapies. In this retrospective comparative study, we evaluate the benefits and outcome of Trendelenburg procedure for varicose veins of lower limbs with and without venous stripping. This study aims at determining the percentage of hematoma formation in thigh, healing of wounds in leg at site of incompetence perforators, comfortable ambulation on first post op day without much pain, and post-operative hospital stay. **Materials and Methods:** A total of 70 patients admitted and operated for varicose veins in our institution during the period of May 2020 to May 2022 were included in the study. Among the 70, 35 underwent venous tripping along with Trendelenburg procedure and the other 35 were treated with Trendelenburg procedure without venous stripping. The two groups were compared statistically to find out whether there is significant difference between the outcomes of two surgical procedures. **Result:** Out of the total 70 patients, hematoma formation in the thigh was seen in 25.7% of patients who underwent stripping whereas 2.9% who underwent Trendelenburg procedure alone without venous stripping. When the patients were encouraged to walk on first post-operative day 65.7% of those who underwent stripping and 94.3% from those who underwent ligation alone had comfortable ambulation. In case of venous stripping, the tissue trauma, hematoma formation and pain was more. Long stay of more than 6 days was found in 8.6% in patients who underwent venous stripping and 5.7% without venous stripping. **Conclusion:** Our study shows that ligation without venous stripping has reduced incidence of hematoma formation and ambulation was easier and less painful on post-operative day one. Trendelenburg procedure with incompetent perforators ligation without venous stripping appears to be better than Trendelenburg procedure with incompetent perforators ligation with venous stripping in terms of ambulation comfort, hematoma formation.

## INTRODUCTION

Vein is called 'varicose' when it is dilated and tortuous. There are various places in the body where veins show tendency towards varicosity e.g. veins of the lower limb, spermatic veins, esophageal veins and haemorrhoidal veins. So far as the etiology is concerned varicose veins mostly occur due to incompetence of their valves. It is not found in other animals and seems to be a part of penalty of erect posture which the human beings have adopted. It

occurs commonly in those whose works demand standing for long hours e.g. conductors, drivers of the trams etc. Yet it is not uncommon in women. So some other etiologic factors seem to play major roles. These are tone and contractility of the muscles of the lower limb being encircled by a tough deep fascia. Incompetence of valves, which may be a sequel of venous thrombosis, seems to be the most important factor in initiating this condition. Varicosity may also be secondary, predisposed by any obstruction which hampers venous return e.g. tumors (abdominal

tumors, fibroid, ovarian cyst, abdominal lymphadenopathy), pregnancy, loaded colon, retroperitoneal fibrosis, ascites. A hormonal factor (progesterone?) gives an indication of occurrence of this disease in females. In younger age group congenital arterio venous fistula may be the cause of varicose veins.<sup>[1-8]</sup> Though not a very fatal disease, the morbidity caused by this disease is more.<sup>[1]</sup> Severity of the disease range from telangiectasia to palpable dilated tortuous veins with limb edema, skin changes like lipodermatosclerosis, dermatitis, ulcer formation etc. Many treatment modalities are available for the condition including conservative, surgical and endovascular therapies. It is advised that all symptomatic patients should be treated with surgical management.<sup>[2]</sup> Minimally invasive varicose vein surgeries are becoming more popular and available.<sup>[9]</sup> The most preferred and fairly standard method followed still is saphenofemoral flush ligation with venous stripping with subfascial ligation of incompetent perforators.<sup>[9]</sup> The main objective of this comparative study is to compare the outcome of two surgical treatment modalities of varicose veins one group of patients undergoes Trendelenburg procedure with subfascial ligation of incompetent perforators whereas the other group undergoes Trendelenburg procedure with stripping of long saphenous vein from groin to knee. The two modalities are compared in terms of hematoma formation in the thigh, healing of wounds in the leg at the site of incompetent perforators, comfortable ambulation without much pain on first post-operative day, postoperative hospital stay, pain relief of the patient after two months.

## MATERIALS AND METHODS

This is a retrospective study conducted in all units in Department of General Surgery in Govt. Kilpauk Medical College and Govt. Royapettah Hospital in for a period of 2 years from May 2020 to MAY 2022. For this study 70 cases in the age group of 16 to 70 were selected. Inclusion criteria were varicose vein with Saphenofemoral valve incompetence and perforators incompetence, age between 16 and 70. Exclusion criteria were age extremes <16 years and >70 years, patients with deep vein thrombosis, patients with associated short saphenous vein varicosity, patients with venous ulcer or other skin changes and patients with recurrent varicosities. For all the patients, detailed history, clinical examination, basic blood investigations chest x-ray, ECG venous Doppler of the affected limb were taken. Patients were divided into two groups, each with 35 members, and proceeded with one of the two types of surgical treatment modality. In group I, 35 patients underwent Trendelenburg procedure by making a transverse incision of length 3cm just below the groin crease extending from femoral artery pulsation site towards medially. The incompetent perforators in the thigh

and leg are ligated and divided subfascially by making small transverse incision across the path of the vein at the site of incompetent perforators marked preoperatively. Then the long saphenous vein is stripped from groin to just below the knee by passing stripper into the vein. In group II, 35 patients underwent Trendelenburg procedure by making a transverse incision of length 3cm just below the groin crease extending from the site of femoral artery pulsation medially. The incompetent perforators in the leg are ligated and divided subfascially by making small transverse incision across the path of the vein at the site of incompetent perforators marked preoperatively. In both groups the wounds closed with good hemostasis. Limb elevation and Elastocrepe bandage were done. All the patients were followed in the postoperatively for a period of next two months. Data of all the patients including investigations, procedure undergone, follow up were recorded in separate proforma for individual patients. Various factors were taken for comparison. Hematoma formation in the thigh among patients were examined daily in the postoperative period. Healing of wounds in the leg at the site of incompetent perforators were compared using the time taken for the sutured wounds to heal. If the wound takes more than 6 days to heal it was considered as delayed and were recorded. Comfortable ambulation without much pain on first post - operative day among all the patients were assessed by encouraging them to walk for some time with elastic stockings. The patients who were able to walk comfortably on first postoperative day with minimal pain were recorded. Duration of postoperative hospital stay was recorded. Usually the patients were discharged on third postoperative day. Those who were in the ward for more than 6 days because of pain, delayed wound healing were noted. Patients were followed up on OP basis postoperatively for a period of 2 months to check for post-operative pain. Any pain in the affected limb of the patient was enquired and recorded as per visual analog scale preoperatively. All the patients were enquired after two months of the procedure about their pain relief and recorded as per visual analog scale. Any improvement of more than five score was considered as good pain relief.

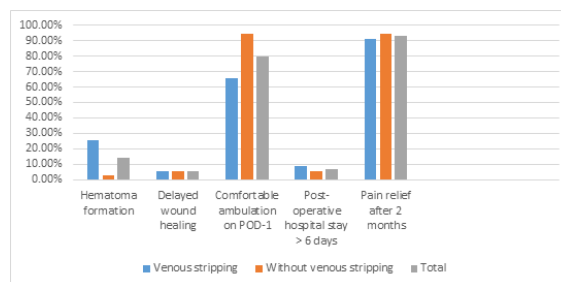
### Statistical analysis of study

The two studies were compared statistically to find out whether there is significant difference between the outcomes of two surgical procedures. Data was entered in MS excel and for analysis, IBM SPSS statistics version 23 for Windows was used. The null hypothesis was assumed: that is to begin with, it was assumed that there is no difference between the two procedures. By using chi-square test, all individual variables were checked for significance. Since we are using 2x 2 table, the degree of freedom is 1. A Chi-Square value is >3.84 and the P value is < 0.05 was considered statistically significant.

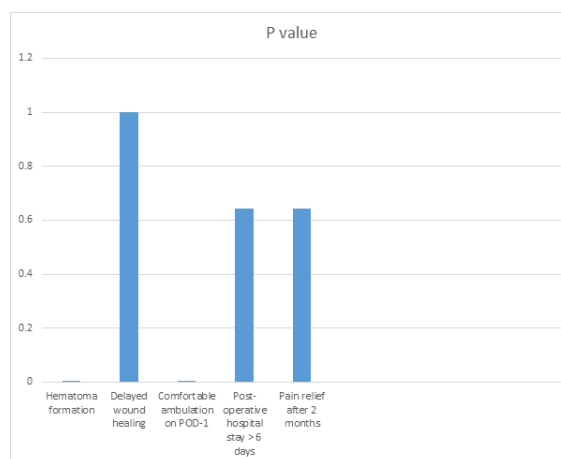
## RESULTS

A total of 70 people were included in the study. They were divided into two groups each consisting of 35 members. In our study male patients constitute 87%. Among 70 patients in this study 30 males underwent venous stripping and 31 males underwent procedure without venous stripping. This study included age between 16 and 70. The lowest age in our study was 25 and highest was 60. The age group of 16 to 40 constituted 42% whereas 40 to 70 age group contributes 58%. In our study 41-60 years constituted the majority. Left leg was more commonly involved than right side. The left limb involvement was 66% and right limb was involved in 33% of patients. Hematoma formation in the thigh was seen in 25.7% of patients who underwent stripping whereas 2.9% who underwent Trendelenburg procedure alone without venous stripping. According to null hypothesis expected frequency of hematoma formation is, with venous stripping 12.64% and without venous stripping 5.76% whereas the observed values were 25.7% and 2.9% respectively in each groups. The P value was 0.006 ( $< 0.05$ ). Hence it was significant. So null hypothesis was not true and there was significant difference between two procedures with respect to hematoma formation. In both the groups, incompetent perforators in legs were approached by making transverse incisions at the sites marked preoperatively. 2% patients in each group had delayed wound healing. Since, observations were same in both groups, no further application of Chi Square test was needed. When the patients were encouraged to walk on first post-operative day, 65.7% of those who underwent stripping and 94.3% of those who underwent ligation alone had comfortable ambulation. P value was 0.003 ( $< 0.05$ ) and significant. There was significant difference when two procedures were combined. In case of venous stripping, the tissue trauma, hematoma formation and pain was more. Long stay

of more than 6 days was found in 8.6% in patients who underwent venous stripping and 5.7% without venous stripping. P value was insignificant which was  $0.643 > 0.05$ , hence null hypothesis was true when prolonged duration of post-operative hospital stay was considered. When pain relief was considered after 2 months of follow up, it did not show much difference among the two procedures. P value was  $0.643 > 0.05$ , hence null hypothesis was true.



**Figure 1: comparison of various observations obtained from both group**



**Figure 2: p values calculated by Pearson's Chi-Square test**

**Table 1: Observed p values of variables by Pearson's Chi-Square test**

	Venous stripping	Without venous stripping	Total	P value
Hematoma formation	25.7%	2.9%	14.3%	0.006
Delayed wound healing	5.7%	5.7%	5.7%	1
Comfortable ambulation on POD-1	65.7%	94.3%	80.0%	0.003
Post-operative hospital stay > 6 days	8.6%	5.7%	7.1%	0.643
Pain relief after 2 months	91.4%	94.3%	92.9%	0.643

## DISCUSSION

Varicose veins has a disease burden of 10-15 % in males and 20-25% in females. Besides being a cosmetic problem, venous insufficiency also affects physical well-being in terms of disability leading to pain, absence from the workplace, and emotional well-being causing the low quality of life (QOL).<sup>[10]</sup> Various modalities of imaging studies as well as treatment methods are currently in practice for varicose veins management. Still, Trendelenburg procedure with stripping of Great Saphenous Vein

remains the most preferred treatment.<sup>[9]</sup> The current study was conducted in 70 patients, divided into two groups, each with 35 patients. Group A underwent GSV, whereas group B underwent surgery with GSV preservation. Majority of the participants were among 40-60 age group. Left leg involvement was more common than right leg. The study population consisted 87% male population, 61 male patients among which 30 underwent stripping and 31 did not. Post-operative outcomes were measured in terms of hematoma formation, comfortable ambulation on post-operative day 1, delayed wound healing,

prolonged post-operative hospital stay and pain relief after 2 months of surgery. Hematoma formation was found to be significant in patients who underwent stripping as compared to those who didn't; percentage wise, 25.7% against 2.9%. This was comparable to the study conducted by Balasubramaniam et al where the hematoma formation in the thigh was seen in 28% of patients who underwent venous stripping whereas it was seen in 4% who underwent Trendelenburg's procedure alone without venous stripping.<sup>[11]</sup> Ambulation on post-operative day one was found to be comfortable without severe pain in 94% of those who underwent Trendelenburg's procedure alone when compared to the other group where it was seen only in 65.7%. Healing of wound was found to be delayed in 5.7% people in both groups. Duration of hospital stay was found to be prolonged in about 8.65% of those who underwent stripping and in 5.7% of those who did not. Natraj et al study also showed similar results in terms of hematoma formation, post-operative ambulation, wound healing and longer duration of hospital stay.<sup>[12-16]</sup>

After 2 months of post-operative period, 91.4% of people who underwent stripping and 94.3% of people who didn't undergo stripping had pain relief. All these findings were comparable to the study by Balasubramaniam et al and Mandal et al.<sup>[11,13]</sup>

## CONCLUSION

In this retrospective comparative study which was done in 70 patients, the observation of short term variables show that venous stripping has increased incidence of hematoma formation and ambulation of patients on first post-operative day was painful. With reference to wound healing, stay and pain relief there is no significant difference between the two procedures. So, as far as the variables are observed, Trendelenburg procedure with incompetent perforators' ligation without venous stripping appears to be better than Trendelenburg procedure with incompetent perforators ligation with venous stripping.

**Limitations:** Limitations of the study were small sample size of 70 and short duration of follow up.

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