

## To Assess the Efficacy of Trendelenberg Surgery with Venous Stripping and Ambulatory Phlebectomy

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### Abstract

*Objective:* To study postoperative pattern of complication following Trendelenberg surgery with venous stripping and ambulatory phlebectomy To study prevalence and severity of complications.

*Method:* Prospective study. The parameters observed were pain, recurrence, infection, haemorrhage, neurological.

*Results:* Out of 52 patients, 71% patients had varicose veins on their left leg. The mean operating time varied between  $87 \pm 22.87$  minutes, mean hospital stay among the study population were seven to eight days and time taken to returned to work was  $40 \pm 5$  post op. After the immediate post op the minimum and maximum VAS score was observed to be 5 and 9 respectively and the minimum and maximum VAS score at 6 months was observed to be 0 and 6 respectively and nil recurrence, infection, haemorrhage and neurological complication. This shows the effect of the new intervention.

*Conclusion:* From the results we have concluded that the Trendelenberg surgery with venous stripping and ambulatory phlebectomy. is advantageous in terms of decreased complications, better functional outcomes and morbidity.

**Keywords:** Trendelenberg Surgery; Ambulatory Phlebectomy; Varicose Vein.

### Aim

To study the postoperative complications following Trendelenberg surgery with venous stripping and ambulatory phlebectomy.

### Objectives

- To study the pattern of complications following Trendelenberg surgery with venous stripping and ambulatory phlebectomy.
- To study the prevalence and severity of complications in follow up of Trendelenberg surgery with venous stripping and ambulatory phlebectomy.

### Type of Study

This is descriptive prospective study clinical study of 12 months duration from Nov 2012 - Oct 2013.

### Study Group

The study involves at least 50 patients diagnosed with varicose vein and underwent trendelenberg surgery with venous stripping and ambulatory phlebectomy.

### Inclusion Criteria

Patient clinically diagnosed to have varicose vein based on CEAP classification and colour Doppler and duplex and who underwent Trendelenberg surgery with stripping and ambulatory phlebectomy.

### Drug Used

The patient will be requiring regular antibiotics, intravenous fluids, analgesics and anaesthesia drugs used in operation theatre during surgery.

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*Parameters Studied*

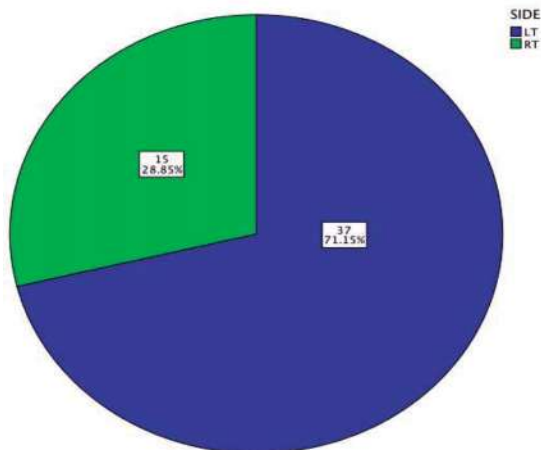
The parameters observed following trendelenberg surgery with venous stripping and ambulatory phlebectomy are Pain, Recurrence, Infection, Haemorrhage, Neurological.

*Method of Statistics*

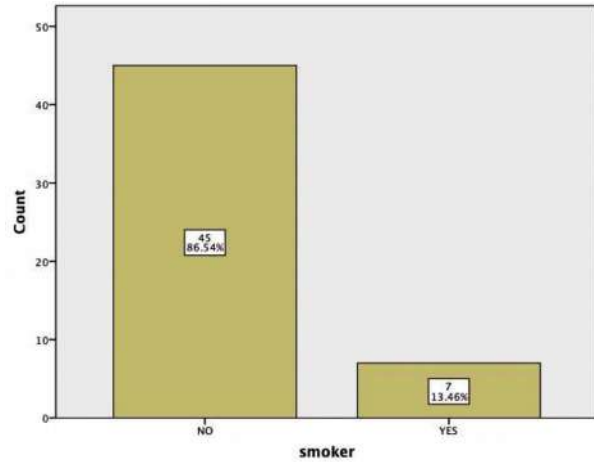
Statistical Analysis is performed for the data collected on different time points say post operative, after 3 months and after 6 months. The study is prospective longitudinal study and the data on parameters is collected over time. Cross tabulations are generated to show how the new intervention has shown its impact on the recovery of the individuals. The numbers in each and every table represent the count of the individuals who have pain over time and for every table percentages are also provided. Further the pain is assessed using Visual Analog Scale (VAS) over time. To analyze such data, Friedman test is applied at 0.05 level of significance. Apart from this descriptive summary such as mean and standard deviation for the parameters operating time, hospital stay and return work. Since the data collected on VAS was over three time points, the statistical technique used to analyze such data is Friedman test and was carried out using SPSS 19.0 version at 0.05 level of significance. The results in the above table show significance results that over time the pain has decreased gradually (Chi-square = 101.507; p-value= 0.000\*).

**Results**

Among the study population the incidence of varicose veins was mostly left sided with 71.2% of the patients had left sided varicose veins.



**Fig. 1:** Pie chart representing the preponderance of varicose veins in the left side in the study population



**Table 1:** Incidence of smoker in the study population

*CEAP Classification*

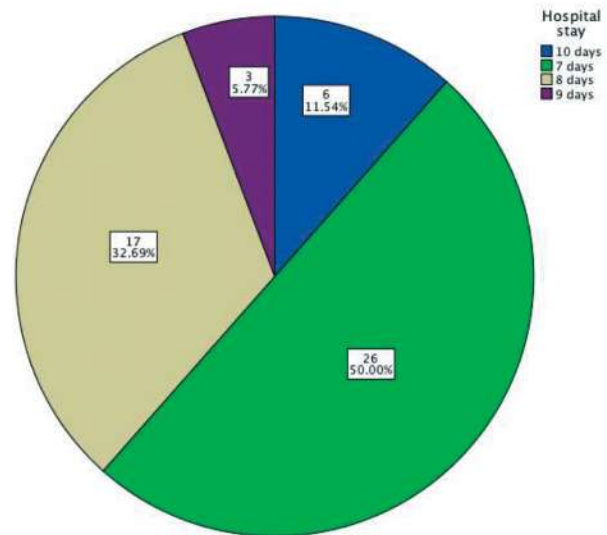
Majority of the patients were in C2SEpAsApPr accounting to about 59.62%.

*Operating Time*

The mean operating time varied between 87± 22.87 minutes.

*Hospital Stay*

Hospital stay among the study population varied with majority of the patients were in hospital for seven to eight days.



**Fig. 2:** Hospital stay among the study population

*Return to Work*

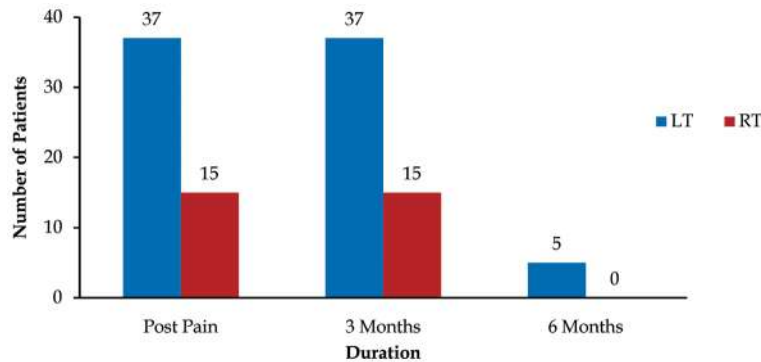
Mean time of the study population returned to work within thirty five to forty five days.

*Post Op Pain vs Side of Varicosity*

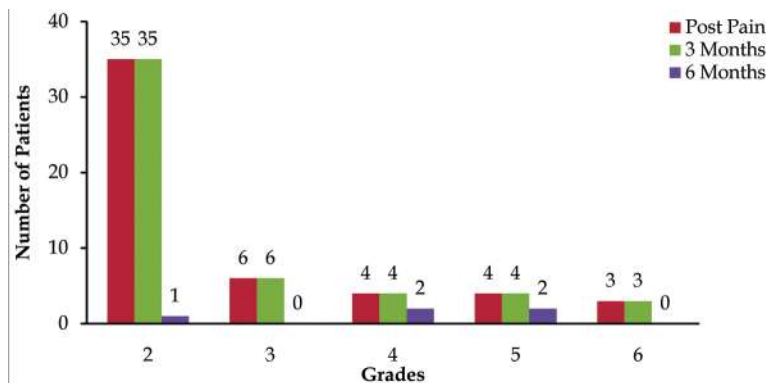
Out of the 52 patients, 37 (71%) patients have undergone the surgery to left side of the leg and the rest to the right side 15(29%). From the results it is noticed

the patients who underwent surgery on the left side still sustained the pain till 6 months of the follow up, where the patients of right side surgery the pain was observed till 3 months.

SIDE	Post Pain		3 Months		6 Months	
	Count	Column N %	Count	Column N %	Count	Column N %
LT	37	0.71	37	0.71	5	1.00
RT	15	0.29	15	0.29	0	0.00



**Table 2:** Representation of VAS score of Patients with Left and Right side over time

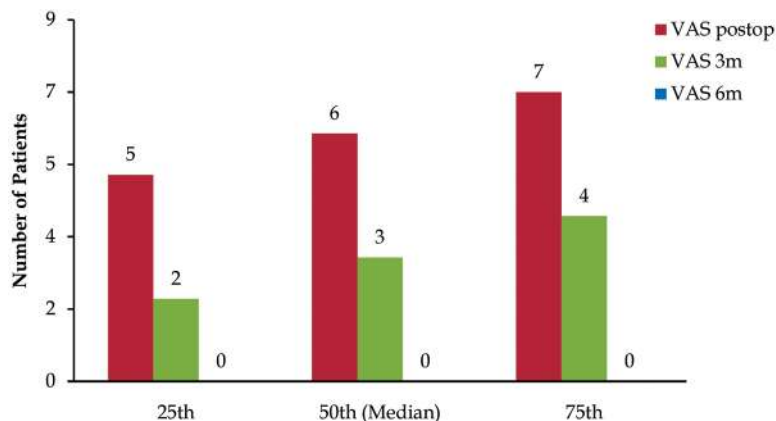


**Table 3:** Representation of VAS score of Patients with Grades over time

*Pain vs Ceap Grades*

Of the 52 subjects, 35 (67%) patients were with grade 2, of which only one patient sustained the pain

upto 6 months, whereas the patients with grade 4 and 5, half of them still having the pain till 6 months of study time.



**Table 4:** Representation of VAS score of Patients over time

*Severity of Pain Post Op, 3<sup>rd</sup> Month, 6<sup>th</sup> Month*

The percentiles show the decreasing pattern over time. After the immediate post op the minimum and maximum VAS score was observed to be 5 and 9

respectively and the minimum and maximum VAS score at 6 months was observed to be 0 and 6 respectively, this shows the effect of the new intervention.

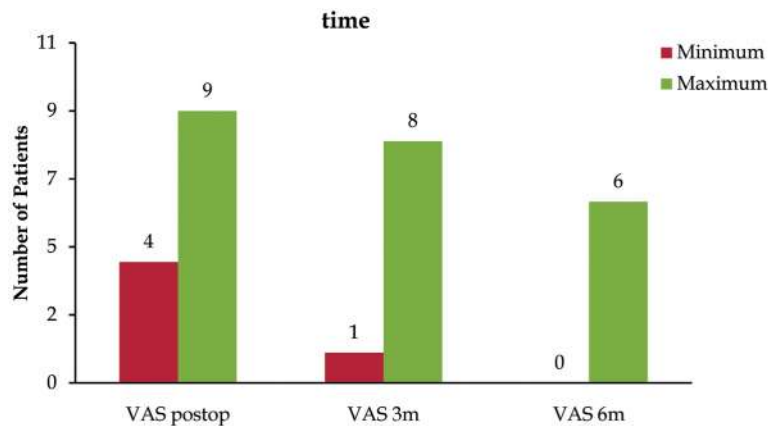


Table 5: Representation of VAS score of Patients over time

## Discussion

All the patients included in this study underwent surgery for varicose veins. Stab avulsions were performed in each of the limbs in addition to conventional varicose vein surgery. Stab avulsions were not performed as the only procedure because all the patients had junctional reflux or perforator incompetence, which are the contraindication for stab avulsing of varicosities.

Junctional reflux noted on duplex scanning was treated by either by Trendelenberg's procedure (flush ligation of the SFJ) or by ligation of the SPJ, whichever was involved. The GSV was stripped, interrupted or preserved as per surgeons' preference. The perforator incompetence was dealt by subfascial ligation. The blowouts and tributaries were stab avulsed using a small incision overlying the area with a stab knife, then hooking out the vein with a mosquito forceps, dividing the vein between clamped hemostats and avulsing each end by rotating the hemostat such that the vein is rolled on to the instrument and finally avulsed. Multiple such avulsions were carried out depending on the size and extension of the varicosities.

Surgical outcomes were collected at pre-determined intervals, and were sorted as those recorded before the discharge of the patient, at 3 months and at 6 months.

Among the fifty two patients in the study population it was observed that most of them had varicose veins in the left leg than right. The left leg varicosity accounted to about 71.15%. the varicosity

in the right leg accounted for 28.85%. A study conducted across Europe with 843 patients has come to a similar conclusion though the exact pathology could not be identified. It still stays as a myth due to the lack of information [41].

In our study population most of the patients happened to be farmers and coolies which accounted for about 71% of the total study population. A similar study conducted by Sharma S et al in the Indian population concluded that the risk of varicose veins is seen more predominantly in males than females and more common in patients standing for long time[42]. Our study has shown similar results. The other unique reason attributed for varicose veins in certain occupation is change in temperature. A study conducted by Konto et al, concluded that the incidence of varicose veins increases with high temperature and a study done by Sharma S et al has attributed it to low temperature[42,43]. The patients in our study population were in professions where there is no shortage of the above mentioned circumstances.

Of the fifty-two patients studied five patients were diabetics accounting to about 9.62% of the total population. This was however contradictory to the study conducted by Mlacjak et al in slovenia which concluded that there is increase in prevalence of varicose veins and chronic venous insufficiency in diabetic patients. Though our primary aim was to assess the post operative complications this aspect of the study was also assessed. Most of our patients in the study population were euglycemic. The prevalence of pain at the end of third month and sixth month, which was our prime objective, was assessed with regards to diabetes mellitus. Conflicting with

the common saga that diabetic patients experience more complication due to infection and pain our study came to a conclusion that diabetes mellitus has no effect on the out come of surgery or complications. The diabetic patients experienced no pain in accordance to VAS score at the end of sixth month. This can be attributed to strict glycemc control in these patients.

Our study population had a minor proportion of patients who were smokers, alcohol abusers and hypertensives. The outcome of these patients at the end of six month were almost similar. One patient of each category experienced pain at the end of six months. A case control study by Gourgou et al in France concluded that venous insufficiency increases with alcohol abuse however the results were not significant [45]. Similarly studies conducted by Carpenter et al and Scott et al revealed similar results [46,47]. A longitudinal study by Scott et al concluded that smokers are more prone to develop varicose veins [47]. A Framingham study conducted by Brand et al concluded that men with varicose veins had higher smoking rates than those without varicose veins which could not be proven in women [48]. But studies by Malhotra et al, Abramson et al, Hirai et al, Franks et al, Lee et al, Carpentier et al, Komsuoglu et al concluded that smoking has no effect in the incidence of varicose veins [49-55]. Our study though did not assess the effect of smoking on the incidence of varicose veins the prevalence of smoking in our study population was of very minor proportion. This leads us to the speculation that smoking has no effect in the incidence of varicose veins and concurring with the latter set of studies. However further evidence with longitudinal studies may be required to prove the association between smoking and varicose veins.

#### *Postoperative Complications*

Invariably all patients in our study-experienced pain. This was an anticipated complication and all the patients were treated with appropriate analgesics. Antibiotics were started empirically based on the patients clinical profile. The severity of pain varied depending on patients and other parameters like age, sex, glycemc status, smoking and alcohol abuse among the patients in the study population. All patients were discharged around day seven and eight with a minor proportion having a hospital stay more than the above mentioned time. As our primary outcome was to assess the severity of pain post operatively and compare it with reduction of pain at the end of third and sixth month pain was scored using the VAS scoring system. Fifty percent of the

patients had scores above five. The severity of pain was more subjective and varied between individuals in the study population and their ability to tolerate pain.

A total of 5 patients accounting to 9.62% experienced pain at the end of six months. Of this proportion of patients one patient accounting to 1.92% experienced pain with a VAS score of six. The remaining population had VAS score of five or less. Though one patient had pain at the end of six months the overall outcome was more in favor of this procedure. The patients who experienced pain were treated with analgesics and other modalities to resolve the complications and increase the quality of life.

#### *Quality of Life*

Quality of life was assessed with the duration of stay in the hospital and number of days taken to return to work. Sixty five percent of the patients returned to work within a time span of thirty five to forty five days. Eighty two percent of the study population were discharged within seven to eight days from the hospital with no major complications.

#### *Other Complications*

In our study the other complication associated with the procedure was hemorrhage which was observed in one patient which accounted to about 1.92%. this symptom was promptly treated. Other complications like infections, recurrence, neurological pain were not observed in our study population at the end of 3<sup>rd</sup> and 6<sup>th</sup> months.

#### *Stab Avulsions*

This is an easy to perform procedure done either in addition to other surgeries or for small branch / tributary varicosities and recurrent / residual cases. Consumes very less time and requires less expertise and can be performed in a very small incision hence is associated with faster recovery [56].

#### *Cosmetc Appeal*

This procedure uses a very small incision which may or may not be sutured, Healing occurs with minimal scarring. In 1995 Baker and Turnbull concluded that when stab avulsions are performed the patient satisfaction is unanimous. The fact of using no sub-dermal suture material that excludes the possibility of a stitch abscess or stitch granuloma formation.

### Summary

In a study of 52 patients conducted in Pondicherry institute of medical sciences the following conclusions were drawn.

- Varicose veins predominantly affects the left lower limb
- It is associated with professions where standing for long duration is one of the job description.
- Pain is the most common presenting symptom
- Association of varicose veins and conditions like diabetes mellitus, hypertension and substance abuse like smoking, alcohol abuse is still of query.
- Complication associated with stab avulsion were minimal.
- Stab avulsions are easy to perform.
- Hemorrhage is one of the noteworthy complication of stab avulsions.
- Stab avulsions have nil recurrence rate, infections and neurologic pain.
- Stab avulsions are cosmetically superior.

### Conclusion

This prospective longitudinal study aimed at assessing the complications associated with a surgical procedure namely the Trendelenberg surgery with venous stripping and ambulatory phlebectomy. From the results we have concluded that the Trendelenberg surgery with venous stripping and ambulatory phlebectomy. is advantageous in terms of decreased complications, better functional outcomes and morbidity.

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