



COMPARISON OF RADIOFREQUENCY ABLATION TO CONVENTIONAL HIGH LIGATION AND STRIPPING IN TRUNCAL VARICOSITIES

General Surgery

Dr. Sharath Chandra B.J

Professor And HOD, Department Of General Surgery, JSS Medical College, Mysuru.

Dr. Ganesh G Gowda

Assistant Professor, Department Of Vascular Surgery, JSS Medical College, Mysuru.

Dr. Sanjay Natarajan*

Post Graduate Resident, Department Of General Surgery, JSS Medical College, Mysuru.
*Corresponding Author

ABSTRACT

INTRODUCTION: Both High Ligation/ Stripping and Radiofrequency ablation have been accepted as a standard in the management of varicose veins and are being performed by general and vascular surgeons. **OBJECTIVES:** To compare the postoperative outcome in terms of timing of return to daily activities, post-operative pain scoring, incidence of hematoma, thrombophlebitis and improvement in Venous Severity scores among patients undergoing High Ligation/ Stripping and Radiofrequency Ablation. **METHODOLOGY:** This study was conducted in JSS Hospital in the departments of general and vascular surgery. A total of 72 patients with Duplex confirmed truncal varicosities were included in the study and 36 underwent High Ligation/ Stripping while 36 underwent Radiofrequency Ablation. Follow up was done at POD1, 3, 5, 7, 30 and at the end of 3 months. **RESULTS:** There was no recurrence in the two groups but RFA group had significantly lesser duration of hospital stay (P value <0.0001), lesser postoperative Visual Analogue Score for pain (1.17 ± 0.94 on day 7) and earlier return to work (3.56 ± 1.87 days), $P < 0.0001$. **CONCLUSION:** Patients who underwent RFA had lesser post-operative pain scores, lesser duration of hospitalization, early return to work but there was no recurrence in both groups at the end of 3 months.

KEYWORDS

Radiofrequency Ablation, High Ligation And Stripping, Truncal Varicosity

INTRODUCTION

Human beings have dealt with varicose veins since time immemorial^[1]. There are records of ancient Greek methods for treating varicose veins as early as 16th century BC in Ebers papyrus. Though evolution has granted man the ability to stand and move in an upright manner, man has to pay a price for it, in the form of varicose veins^[2]. The earliest methods of treating varicose veins were gruesome, painful, morbid and resulted in exsanguination, but with advances in surgery and anaesthesia the modern methods of treatment have become less morbid and have made a significant positive impact on the surgical outcome and patient comfort^[3].

In India varicose veins are under diagnosed and in many cases treatment is sought only in the later stages of the disease^[4] when the patient develops severe symptoms like ulcerations.

This study which is done at a tertiary care hospital in India will help us compare the early clinical outcome and patient comfort conventional High Ligation/ Stripping with newer minimally invasive Radiofrequency Ablation in the management of truncal varicosities.

MATERIALS AND METHODS

Study population and source of data

Patients who attend the outpatient departments of General and Vascular surgery and are diagnosed to have truncal varicosities are taken as the study population

Inclusion Criteria

- Patients in the age group between 18-80 years
- Patients with GSV/SSV Varicosities
- Patients with Clinical Score ≥ 2 [CEAP]

Exclusion Criteria

- Secondary Varicose veins- Eg DVT, tumour, pregnancy
- Isolated perforator incompetence
- Congenital anomalies like Klippel Trenaunay syndrome
- Recurrent varicose veins

Study conduct

The patients presenting to JSS hospital with varicose veins were given the option to undergo either Stripping or RFA. The data was collected from the patients undergoing either of the procedure through history taking, clinical examination, venous doppler, laboratory investigations, postoperative pain scoring and follow up at 72 hours, 1 month and 3 months. The data which were collected include

Venous severity score, duration of hospitalization, timing of return to daily activities, presence of recurrence in clinical examination, incidence of perioperative events including bruising, hematoma, saphenous paraesthesia. The collected data was entered and analysed through SPSS 21 software.

RESULTS

The mean age of the High Ligation/Stripping Group was 52.83 ± 11.71 and RFA group was 56.27 ± 14.27 . Both the groups were comparable as the p value calculated to be >0.05 . Majority belonged to 51-60 years age group in High Ligation/Stripping Group whereas it was 41-50 years in RFA group

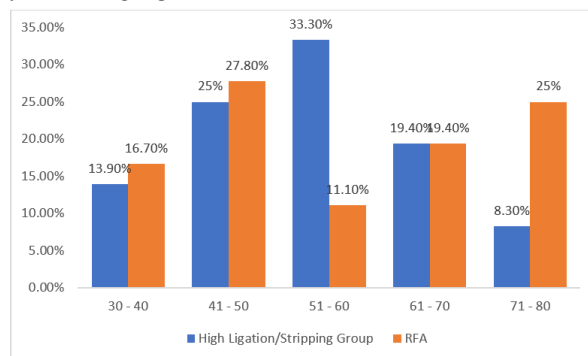


Figure 1 Distribution based on age

In the present study, among the High Ligation / Stripping Group 52.8% were female and 47.2% were male in RFA group, 66.7% were female, 33.3% were male. Gender wise the study groups were comparable as the p value calculated to be >0.05 .

The mean BMI among the high ligation or stripping group was 26.62 ± 5.68 and among the RFA group it was 29.52 ± 5.90 . Among the high ligation group, Majority were overweight and among the RFA group majority were obese.

Table 1 Perioperative event- Bruising

	High Ligation/Stripping Group	RFA
Yes	3 (8.3%)	1 (2.8%)
No	33 (91.7%)	35 (97.2%)
Total	36 (100%)	36 (100%)

8.3% in high ligation group were having bruising and it was 2.8% in RFA group

Table2 Perioperative event - Saphenous Paraesthesia

	High Ligation/Stripping Group	RFA
Yes	1 (2.8%)	0
No	35 (97.2%)	36 (100%)
Total	36 (100%)	36 (100%)

Saphenous paraesthesia was observed in 2.8% in high ligation group whereas it was 0% in RFA group.

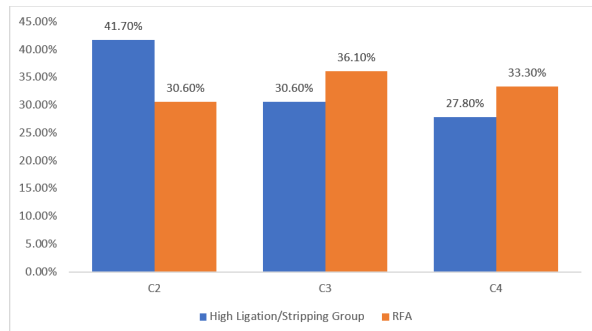


Figure2 Distribution Based On Clinical Score (CEAP)

Distribution based on CEAP, 41.7% in high ligation group, C2 in 41.7% and in RFA group it was 30.6%, C3 was observed in 30.6% in high ligation group it was 36.1% in RFA group, C4 was observed and 27.8% in high ligation group whereas it was 33.3% in RFA group.

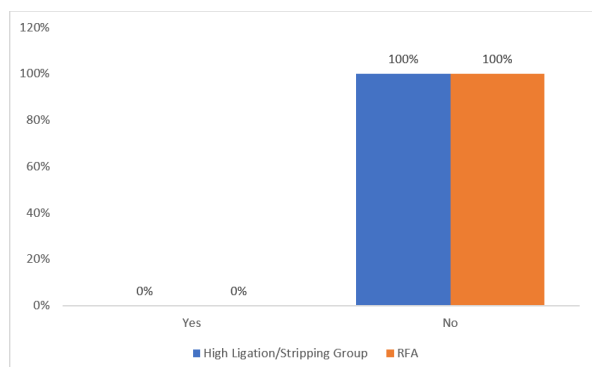


Figure3 Distribution based on recurrence

There was no recurrence at follow up after 3 months in both groups

Table 3 Hospital stay in hours

Hospital stay in Hours	High Ligation/Stripping Group	RFA
<18 hrs	0 (0%)	10 (27.8%)
18 – 24 hrs	13 (36.1%)	10 (27.8%)
24 – 48 hrs	11 (30.6%)	16 (44.4%)
48 – 72 hrs	12 (33.3%)	0 (0%)
Total	36 (100%)	36 (100%)

Based on the duration of hospital stay in hours, 27.8% of patients who underwent RFA had a hospital stay of less than 18 hours and 44.4% of patients who underwent RFA had a hospital stay of less than 48 hours and none of the patients who underwent RFA had a hospital stay of more than 48 hours. Conversely, in High Ligation and stripping group, none of the patients had a hospital stay of less than 18 hours and 33% of patients had a hospital stay of more than 48 hours. There was a statistically significant difference observed between the study groups as P value calculated to be less than 0.05.

Table 4 Improvement In Venous Clinical Severity Score

Venous severity score	High Ligation/Stripping Group	RFA	P value
Pre Op	8.69 ± 2.0	8.39 ± 1.81	>0.05
Post Op	4.89 ± 1.51	2.08 ± 1.11	<0.05*



Figure4 Line chart on improvement in venous clinical severity score

The mean Venous severity score in high ligation group was 8.69 in pre-operative whereas it was 8.39 in RFA group there was no statistically significant difference between the two groups as P value calculated to be more than 0.05.

There was a significant decrease in Venous severity score observed in RFA group compare to Pre op conditions and this value was statistically significant as P value calculated to be less than 0.05.

Table 5 Days Taken To Return To Work

	High Ligation/Stripping Group	RFA	P value
Mean ± SD	14.56 ± 3.63	3.56 ± 1.87	<0.05*

The mean return to work in days in high ligation group was 14.56 and in RFA group it was 3.56 this value was statistically significant p value calculated to be less than 0.05

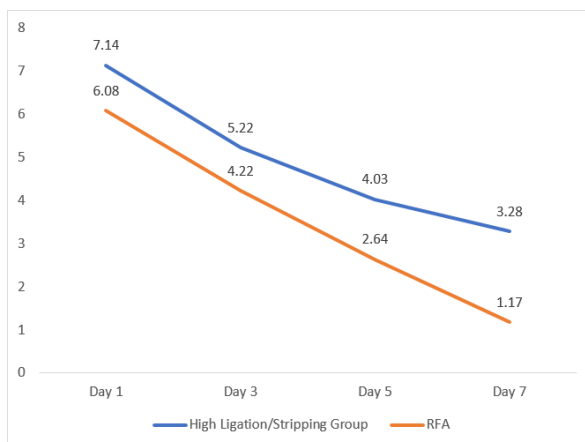


Figure5 Line Diagram On Post Operative Pain Scoring

In the present study there was a significant decline in VAS score with relation to RFA group. There was a statistically significant difference was observed between the mean VAS score between the two groups at day 1, day 3, day 5, and Day 7 as the P value calculated to be less than 0.05.

There was no evidence of Deep Vein Thrombosis in both groups.

DISCUSSION

In present study, majority of patients (33.3%) underwent stripping belong to the age group of 51 – 60 years and patients (27.8%) underwent RFA belong to the age group of 41 – 50 years. The mean age of patients underwent stripping was 52.83 ± 11.71 years and in patients underwent RFA was 56.27 ± 14.27 years. There was no statistically significant difference in age among the study groups (P value 0.128). 47.2% were males and 52.8% were females among patients underwent stripping. 33.3% were males and 66.7% were females among patients underwent RFA for varicose veins. There was no statistically significant difference in gender distribution among the study groups. Similarly in a study done by Igor Rafeal Sincos et al^[5] showed that the mean age among patients of stripping group was 49.3 ± 11.7 years and in patients of RFA group was 44.1 ± 11.7 years which was not significant (P value 0.128) among the study groups. Also in the study it was showed there was no statistical significant difference in gender

distribution among the study population (P value 0.731).

Similarly in a study done by Eleftherios S Xenos, Gabriel Bietz, David J Minion et al^[6] showed the mean age of the patients of stripping group was 48.4 ± 5.44 years and in patients of RFA group was 47 ± 7.48 years which was not statistically significant (P value 0.69).

In present study, the mean BMI of the patients underwent stripping was 29.62 ± 5.68 kg/m² and among the patients underwent RFA was 29.52 ± 5.9 kg/m². There was no statistically significant difference in BMI among the study groups (P value 0.771).

In a study done by Igor Rapheal Sincos et al^[7] showed that the mean BMI of patients in stripping group was 26.7 ± 3.7 kg/m² and in patients of RFA group was 26.9 ± 3.5 kg/m² which was not significant among the study groups (P value 0.776).

In present study, majority of patients (41.7%) underwent stripping had CEAP score of C1 and majority of patients (36.1%) underwent RFA had CEAP score of C2. There was no statistically significant difference in CEAP score among the study groups (P value 0.401). There was zero recurrence rate of varicose veins in both the study groups. In a study done by Andrian O Tonev et al^[7] showed that majority of patient in both the study groups belong to CEAP class of C2 (26 patients vs 22 patients in stripping group and RFA group respectively).

In present study, 27.8% of patients who underwent RFA had a hospital stay of less than 18 hours and 44.4% of patients who underwent RFA had a hospital stay of less than 48 hours and none of the patients who underwent RFA had a hospital stay of more than 48 hours. Conversely, in High Ligation and stripping group, none of the patients had a hospital stay of less than 18 hours and 33% of patients had a hospital stay of more than 48 hours. There was statistically significant reduction in duration of hospital stay among patients underwent RFA when compared to patients underwent stripping (P value <0.0001). In a study done by Latchu et al^[8] showed among 50 patients the duration of hospital stay in patients of stripping was 4.6 ± 0.8 days and in patients of RFA group was 2.72 ± 0.74 days which was significantly lesser in patient with RFA when compared with patients with stripping (P value <0.001).

In present study, the pre-operative venous score among the patients underwent stripping was 8.69 ± 2.0 and among patients underwent RFA was 8.39 ± 1.81 . There was no statistically significant difference in pre-operative venous score among the study groups (P value 0.506). The post-operative venous score among the patients underwent stripping was 4.89 ± 1.51 and among patients underwent RFA was 2.08 ± 1.11 . There was statistically significant decrease in venous score among the study groups (P value <0.0001). Similar findings shown in a study done by Martin Lawaetz et al^[9].

In present study, the mean duration of return to normal work in patients underwent stripping was 14.56 ± 3.63 days where as in patients underwent RFA was 3.56 ± 1.87 days. There was statistically significant lesser number of days required to return to normal work by the patients underwent RFA when compared to patients underwent stripping (P value <0.0001). In a study done by S.Subramonia^[10] et al in a study showed the duration of return to work in patients with stripping was 18.5 days and in patients with RFA was 10 days which was significantly lesser with RFA than stripping (P value <0.001). In a study done by Latchu et al^[8] showed that the duration of return to normal activity in patients of stripping was significantly longer than patients in RFA group (P value <0.001).

In present study post-operative pain score, the mean VAS score of the patients underwent stripping was 7.14 ± 1.66 and in patients underwent RFA was 6.08 ± 1.25 on day 1 which was statistically significant (P value 0.003). The mean VAS score of the patients underwent stripping was 5.22 ± 2.1 and in patients underwent RFA was 4.22 ± 1.53 on day 3 which was statistically significant (P value 0.023). The mean VAS score of the patients underwent stripping was 4.03 ± 1.99 and in patients underwent RFA was 2.64 ± 1.73 on day 5 which was statistically significant (P value 0.002). The mean VAS score of the patients underwent stripping was 3.28 ± 1.72 and in patients underwent RFA was 1.17 ± 0.94 on day 7 which was statistically significant (P value <0.0001).

In a study done by El Sayed A Abd El Mabood et al^[3] showed the post-

operative VAS score in patients of stripping group was significantly reduced in patients with RFA group than patients with stripping group (P value 0.001) on first 2 days and after 1 week (P value 0.001).

CONCLUSION

The short term results of Radiofrequency ablation and High ligation/stripping are similar. The modern day patient demands perioperative comfort, minimally invasive technique of surgery, maximal clinical outcome and lesser duration of hospitalization which can be offered by Radiofrequency ablation. With lesser postoperative pain, no wound related complications and lesser incidence of bruising/hematoma RFA is bound to be the preferred procedure in terms of patient satisfaction but both procedures are equally efficient in achieving the aim of the surgery - eliminating the superficial venous reflux. Hence the surgeon has to give the options available to the patient with the pros and cons of each procedure so that the patient can make an informed decision.

REFERENCES

1. Van den Bremer, J., & Moll, F. L. (2010). Historical overview of varicose vein surgery. *Annals of Vascular Surgery*, 24(3), 426–432.
2. Campbell, B. (2006). Varicose veins and their management. *BMJ (Clinical Research Ed.)*, 333(7562), 287–292.
3. Abd El-Mabood, E.-S., El-Gohary, H., & Salem, A. (2017). Radiofrequency ablation (RFA) for primary varicose veins: a feasible day-case procedure with good surgical and functional outcomes. *The Egyptian Journal of Surgery*, 36(4), 407.
4. Ravikumar, B. L., R. S. K., & Jain, A. (2014). OUR EXPERIENCE IN THE MANAGEMENT OF VARICOSE VEINS OF THE LOWER LIMB. *JOURNAL OF EVOLUTION OF MEDICINE*, 3(16), 4137–4144.
5. Sincos, I. R., Baptista, A. P. W., Coelho Neto, F., Labropoulos, N., Alledi, L. B., Marins, E. M. de, ... Aun, R. (2019). Prospective randomized trial comparing radiofrequency ablation and complete saphenous vein stripping in patients with mild to moderate chronic venous disease with a 3-year follow-up. *Einstein (Sao Paulo, Brazil)*, 17(2), eAO4526.
6. Xenos, E. S., Bietz, G., Minion, D. J., Abedi, N. N., Sorial, E. E., Karagiorgos, N., & Endean, E. D. (2009). Endoluminal thermal ablation versus stripping of the saphenous vein: Meta-analysis of recurrence of reflux. *The International Journal of Angiology: Official Publication of the International College of Angiology, Inc.*, 18(2), 75–78.
7. Tonev, A. O., Genadiev, S. G., Dimitrov, S. G., Zahariev, T. T., & Nachev, G. K. (2013). A retrospective study of 100 patients with varicose veins treated with radiofrequency ablation and stripping. *Phlebology*, 20(3), 125–164.
8. Latchu, & Associate Professor, Department of General Surgery, Gandhi Medical College, Secunderabad, Telangana, INDIA. (2019). A comparative study of radiofrequency ablation vs SFJ ligation and stripping in the treatment of primary varicose veins with SFJ incompetence. *Medpulse International Journal of Surgery*, 11(2), 138–143.
9. Lawaetz, M., Serup, J., Lawaetz, B., Bjoern, L., Blemings, A., Eklof, B., & Rasmussen, L. (2017). Comparison of endovenous ablation techniques, foam sclerotherapy and surgical stripping for great saphenous varicose veins. Extended 5-year follow-up of a RCT. *International Angiology: A Journal of the International Union of Angiology*, 36(3), 281–288.
10. Subramonia, S., & Lees, T. (2010). Radiofrequency ablation vs conventional surgery for varicose veins - a comparison of treatment costs in a randomised trial. *European Journal of Vascular and Endovascular Surgery: The Official Journal of the European Society for Vascular Surgery*, 39(1), 104–111.