

## ORIGINAL RESEARCH

# Comparative analysis of open surgery with venous stripping and radiofrequency ablation (RFA) for the treatment of varicose veins

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### ABSTRACT

**Aim:** Comparative analysis of open surgery with venous stripping and radiofrequency ablation (RFA) for the treatment of varicose veins. **Materials and Methods:** This research was done on a sample of 100 patients in the department of general surgery, including both male and female individuals. The patients were segregated into two groups, each consisting of 50 individuals. Those in Group A received open surgery including venous stripping, whereas those in Group B underwent radiofrequency ablation (RFA). The parameters of bleeding, hematoma, blood transfusion, postoperative inflammation, and length of hospital stay were compared. **Results:** There were 29 males and 21 females in group A and 26 males and 24 females in group B. The mean age of the group A and Group B was  $36.46 \pm 3.45$  and  $37.28 \pm 3.68$  respectively. The mean duration of surgery in group A was  $56.66 \pm 3.47$  minutes and in group B was  $17.19 \pm 1.78$  minutes. Hospital stay was  $4.77 \pm 0.88$  days in group A and  $1.36 \pm 0.12$  days in group B. The difference was significant ( $P < 0.05$ ). The common complications were bleeding seen 10 in group A and 2 in group B, hematoma seen 6 in group A and 2 in group B and inflammation seen 37 in group A and 4 in group B. The difference was significant ( $P < 0.05$ ). **Conclusion:** Our findings indicate that conservative therapy with radiofrequency ablation (RFA) is superior to open surgery including venous stripping.

**Keywords:** Open surgery, Venous stripping, Radiofrequency ablation, Varicose veins

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### INTRODUCTION

Varicose veins, together with its associated symptoms and complexities, are the most often encountered chronic vascular issue that requires surgical intervention. Varicosity refers to veins that have become elongated, widened, and twisted, losing their ability to stretch and becoming fragile. They may occur anywhere in the body but are most often seen in the lower extremities [1]. Although not fatal, this illness causes significant melancholy. The therapy option should be tailored to the patient's overall state and symptomatology [2]. The connection between the superficial and deep venous systems is established by perforators in the venous network. Effective venous drainage is maintained by the unidirectional flow of blood, facilitated by valves. Any abnormality

affecting the proper functioning of these valves might result in the development of varicose veins [3]. A common belief among the population of Mauritius is that if varicose veins do not cause any significant symptoms, there is no need for treatment. The inclination to seek therapy for varicose veins with the intention of restoring their condition is quite low [4]. In addition, consumers prefer to choose affordable service over meticulous service. As the disease progresses, there is a need for invasive therapies, such as sclerotherapy, surgeries like Trendelenburg's method, SPJ ligation, GSV stripping, perforator ligation, incision separation, and subfacial endoscopic perforator surgery [5]. Endovenous thermal ablation treatments provide a remarkable alternative to surgery, since they achieve similar results with less

invasiveness. This research compared the efficacy of open surgery with venous stripping and radiofrequency ablation (RFA) for the treatment of varicose veins.

### MATERIALS AND METHODS

This research was done prospectively on a sample of 100 patients in the department of general surgery, including both male and female individuals. Institutional ethics clearance was obtained from the ethical committee. Everyone was notified about the research and formal permission was acquired. Basic demographic data, including name, age, and gender, was documented. The patients were segregated into two groups, each consisting of 50 individuals. those in Group A received open surgery including venous

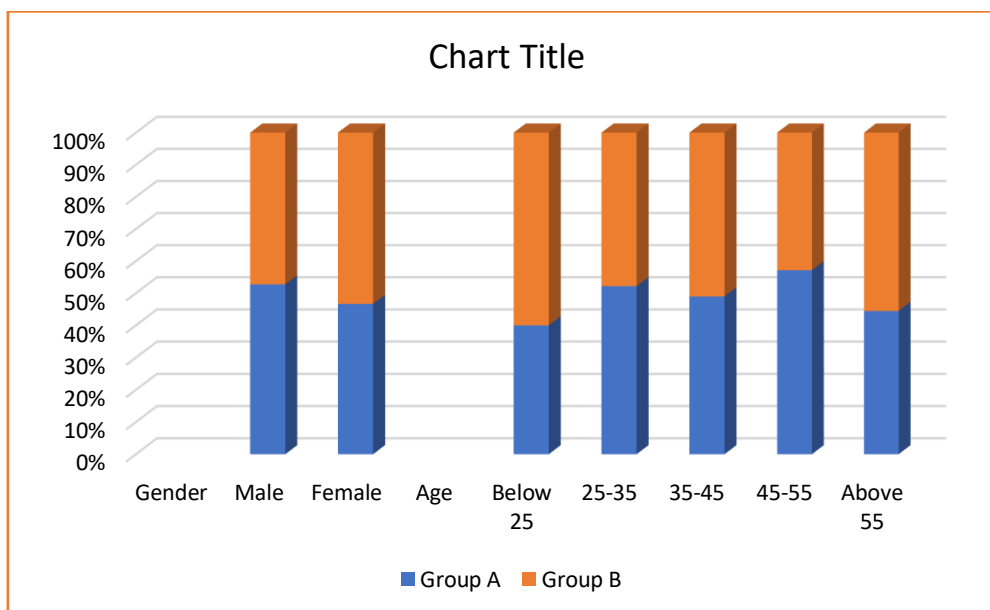
stripping, whereas those in Group B underwent radiofrequency ablation (RFA). The parameters of bleeding, hematoma, blood transfusion, postoperative inflammation, and length of hospital stay were compared. Each and every patient was monitored for a duration of 1 year. The received results were analyzed using statistical methods. A significance level of 0.05 or below was used to determine statistical significance.

### RESULTS

Table I shows that there were 29 males and 21 females in group A and 26 males and 24 females in group B. The mean age of the group A and Group B  $36.46\pm 3.45$  and  $37.28\pm 3.68$  respectively.

**Table 1 Gender and age of the participants**

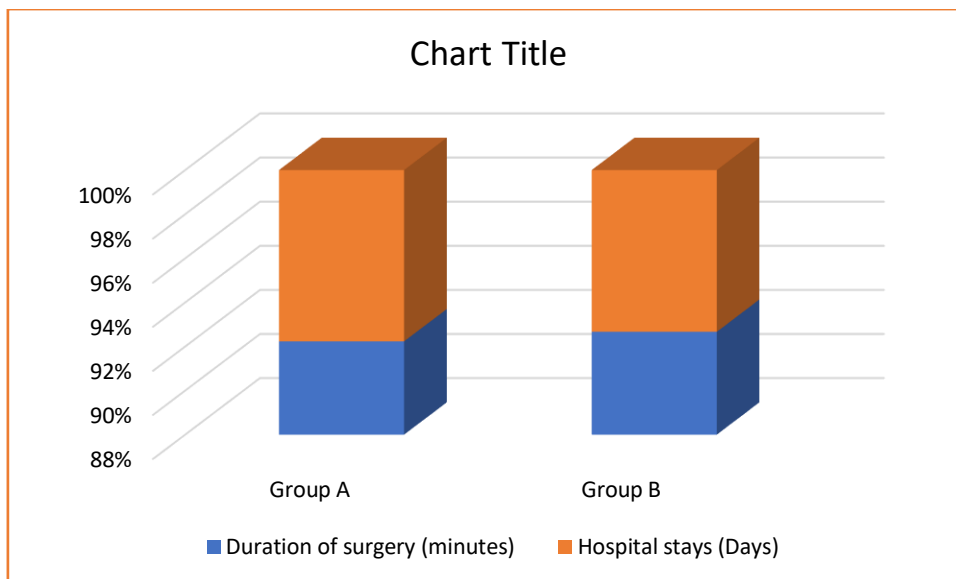
Parameter	Group A	Group B	P value
Gender			0.36
Male	29	26	
Female	21	24	
Age			0.18
Below 25	2	3	
25-35	12	11	
35-45	24	25	
45-55	8	6	
Above 55	4	5	
Mean Age	$36.46\pm 3.45$	$37.28\pm 3.68$	



**Figure 1 Gender and age of the participants**

**Table 2: Comparison of parameters**

Parameter	Group A	Group B	P value
Duration of surgery (minutes)	$56.66\pm 3.47$	$17.19\pm 1.78$	0.02
Blood requirement	2	0	0.03
Hospital stays (Days)	$4.77\pm 0.88$	$1.36\pm 0.12$	0.05

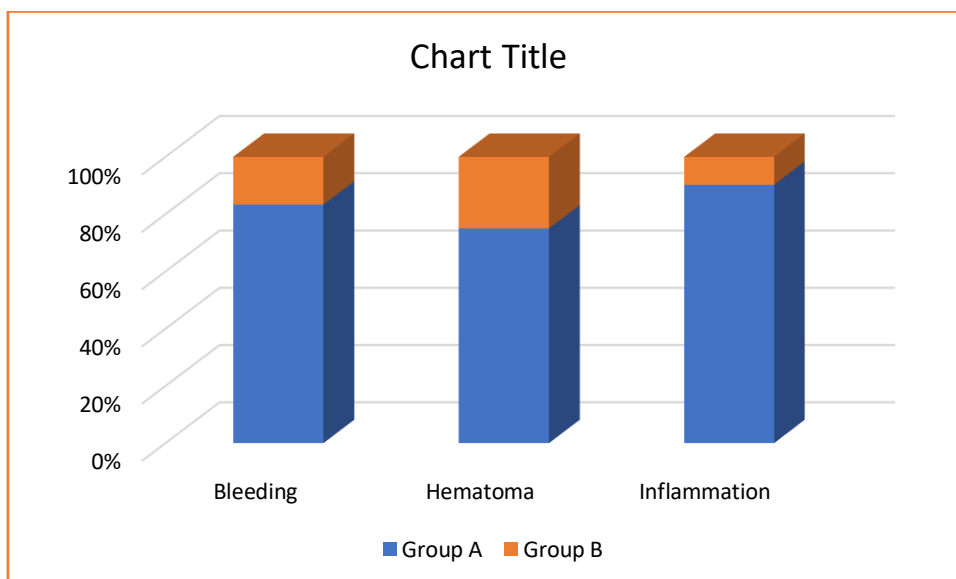


**Figure 2: Comparison of parameters**

Table 2, Fig 2 shows that mean duration of surgery in group A was 56.66±3.47 minutes and in group B was 17.19±1.78minutes. Hospital stay was 4.77±0.88days in group A and 1.36±0.12days in group B. The difference was significant (P< 0.05).

**Table 3: Complications in group A and group B**

Parameter	Group A	Group B	P value
Bleeding	10	2	0.03
Hematoma	6	2	0.04
Inflammation	37	4	0.002



**Figure 3: Complications in group A and group B**

Table 3, graph 3 shows that common complications were bleeding seen 10 in group A and 2 in group B, hematoma seen 6 in group A and 2 in group B and inflammation seen 37 in group A and 4 in group B. The difference was significant (P< 0.05).

**DISCUSSION**

Varicose veins lack a broadly acknowledged definition. The term "varix" in Latin denotes the enlargement of a vein, artery, or lymphatic vessel [6]. The term "varix" is often used to refer to a vein, but "varicosity" specifically describes a vein that is

increased in diameter and has a twisted or tortuous appearance. Varicose veins are enlarged, twisted, and thickened superficial veins in the lower limb that have lost their ability to function properly due to venous hypertension, resulting in dilation and tortuosity [7]. There is a scarcity of confirmations substantiating the

notion of the hereditary illness. The children under the care of the two guardians who have varicose veins are twice as likely to develop the condition. The prevalence of varicose veins increases with age. Statistically, females have a higher predisposition to develop varicosities compared to males[8]. When the deep vein is obstructed, the blood is diverted into the superficial system, leading to progressive dilation, elongation, and damage to the valves, resulting in varicose veins. Various factors contributing to the development of varicosities include prominent stature, height, ethnicity, employment, abdominal habits, abdominal pressure exerted on the veins, inherent weakness of blood vessel walls, and congenital absence of valves [9]. This research conducted a comparison of open surgery including venous stripping and radiofrequency ablation (RFA) for the treatment of varicose veins. This research had a total of 100 patients, who were evenly split into two groups of 50 individuals each. Those in Group A received open surgery including venous stripping, whereas those in Group B underwent radiofrequency ablation (RFA). The RFA device is equipped with a bipolar RFA probe, which has two electrodes inside a single probe. The electrodes are separated by an insulator, and the device also includes a radiofrequency generating unit. The bipolar RFA catheter-based technique involves the delivery of energy by a generator to the vein wall. This energy creates conductive heating, which leads to the contraction of the vein wall. As a result, the collagen fibrils shorten, the endothelium is destroyed, and the venous lumen shrinks due to fibrotic changes in the vein [10]. Brittenden et al. conducted a research in which patients were separated into two groups. Group I consisted of individuals who received open surgical therapy with venous stripping[11]. Group II (n=104) consisted of individuals who had radiofrequency ablation (RFA). The average length of operation in group A was 56.66±3.47 minutes, whereas in group B it was 17.19±1.78 minutes. The duration of hospitalization was 4.77±0.88 days in group A and 1.36±0.12 days in group B. The disparity was statistically significant (P< 0.05). In group A, there were 10 instances of bleeding, 6 instances of hematoma, and 37 instances of inflammation. In group B, there were 2 instances of bleeding, 2 instances of hematoma, and 4 instances of inflammation. The observed discrepancy was statistically significant (P< 0.05). According to Michaels et al, individuals with simple varicose veins who had surgery had a much-improved outlook compared to those who received conservative treatment [12]. When comparing the patients who had surgery and those who were handled conservatively in this research, the surgical therapy resulted in minor problems that did not need any further treatment and caused little pain to the patient. The research is limited by a small sample size and a short follow-up period.

## CONCLUSION

Our findings indicate that conservative therapy with radiofrequency ablation (RFA) is superior to open surgery including venous stripping.

## REFERENCES

1. Wright AP, Berridge DC, Scott DJ. Return to work following varicose vein surgery: influence of type of operation, employment and social status. *Eur J VascEndovas Surg.* 2006;31:553-7.
2. Naithani V, Chanda DK, Bhatiya BP, Sharma AK. Surgical management of varicose veins: a comparative analysis between radiofrequency ablation and open surgery with venous stripping. *Int Surg J* 2020;7:3330-2.
3. Sandhya PA, Mohil RS, Sricharan R. Randomised controlled study to compare radiofrequency ablation with minimally invasive ultrasound-guided non-flush ligation and stripping of great saphenous vein in the treatment of varicose veins. *Ann R Coll Surg Engl.* 2020 Sep;102(7):525-531. doi: 10.1308/rcsann.2020.0116. Epub 2020 Jun 15. PMID: 32538106; PMCID: PMC7450422.
4. Naithani V, Chanda DK, Bhatiya BP, Sharma AK. Surgical management of varicose veins: a comparative analysis between radiofrequency ablation and open surgery with venous stripping. *Int Surg J* 2020;7:3330-2
5. Katsamouris AN, et al. Recurrent Varicose veins after surgery: A new appraisal of a common and complex problem in vascular surgery. *European journal of vascular and Endovascular surgery.* 2004;27(3):275-82.
6. Meissner MH, Gloviczki P, Gergan J, Kistner RL, Morrison N, Pannier F et al. Primary chronic venous disorders. *J Vasc Surg.* 2007;46:54-67.
7. Kistner RL, Ferris E. The evolving management of varicose veins. *Straub clinic experience.* *Postgrad Med.* 1986;80:56-9.
8. Van den Bos R, Arends L, Kockaert M, Neumann M, Nijsten T. Endovenous therapies of lower extremity varicosities: a meta-analysis. *J Vas Surg.* 2009;49:230-9.
9. Wright AP, Berridge DC, Scott DJ. Return to work following varicose vein surgery: influence of type of operation, employment and social status. *Eur J VascEndovas Surg.* 2006;31:553-7.
10. Meissner M. Lower extremity venous anatomy, *Semin. InterventRadiol.* 2005;22:147-56.
11. Brittenden J, Cotton SC, Elders A, Ramsay CR, Norrie J, Burr J et al. A randomized trial comparing treatments for varicose veins. *N Engl J Med.* 2012; 371(13):1218-27.
12. Michaels JA, et al. Randomized clinical trial comparing surgery with conservative treatment for uncomplicated varicose veins. *BJS.* 2000; 175-81