

ORIGINAL RESEARCH

A comparative analysis between open surgery with venous stripping and radiofrequency ablation (RFA) of varicose veins

Dr. Sandeep Shrivastava

Assistant Professor, Department of General Surgery, Government Medical College Datia, Madhya Pradesh, India

Corresponding author

Dr. Sandeep Shrivastava

Assistant Professor, Department of General Surgery, Government Medical College Datia, Madhya Pradesh, India

Received: 12 March, 2023

Accepted: 18 April, 2023

ABSTRACT

Aim: A comparative analysis between open surgery with venous stripping and radiofrequency ablation (RFA) of varicose veins.

Materials and Methods: A prospective study was conducted on a sample of 100 patients from the department of general surgery, encompassing both male and female individuals. The participants were allocated into two groups, each consisting of 50 individuals. Patients in Group A underwent open surgery involving venous stripping, while patients in Group B underwent radiofrequency ablation (RFA). The study compared various parameters, including bleeding, hematoma formation, blood transfusion requirements, postoperative inflammation, and length of hospital stay.

Results: There were 29(58%) males and 21(42%) females in group A and 27(54%) males and 23(46%) females in group B. The mean duration of surgery in group A was 56.11±3.61 minutes and in group B was 17.11±2.11 minutes. Hospital stay was 4.77±0.88 days in group A and 1.33±0.22 days in group B. The difference was significant (P<0.05). The common complications were bleeding seen 13(26%) in group A and 2(4%) in group B, hematoma seen 7(14%) in group A and 2(4%) in group B and inflammation seen 44(88%) in group A and 3(6%) in group B. The difference was significant (P< 0.05).

Conclusion: Our study revealed that conservative management utilizing radiofrequency ablation (RFA) demonstrated superior outcomes when compared to open surgery involving venous stripping.

Keywords: Venous stripping, Radio frequency ablation (RFA), Varicose veins

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Varicose veins and their associated manifestations and complexities represent the most commonly acknowledged chronic vascular condition necessitating surgical intervention. The term varicosity is frequently used to describe veins that have become elongated, dilated, widened, and tortuous, resulting in a loss of their elasticity and increased fragility. Varicose veins can occur in any location within the body, but they are most commonly observed in the lower extremities. Although this illness is not fatal, it is associated with a heightened sense of sadness. The selection of treatment should be tailored to the specific needs and clinical presentation of the patient[1]. The connection between the superficial and deep venous systems is established through perforators in the venous framework. The maintenance of effective venous drainage is achieved through the unidirectional flow of blood, facilitated by the presence of valves.[2] The malfunctioning of these

valves due to any pathological condition can lead to the development of varicose veins. A prevailing belief among the general population of Mauritius is that treatment for varicose veins is unnecessary as long as they do not cause significant symptoms. The inclination to seek treatment for varicose veins is significantly lacking in restorative motivation[3]. Furthermore, individuals tend to prefer moderate administration over meticulous administration. As the disease progresses, there is a need for invasive procedures, such as sclerotherapy and various surgical techniques including Trendelenburg 's technique, SPJ ligation, GSV stripping, perforator ligation, incision separation, and subfacial endoscopic perforator surgery. The utilization of endovenous thermal ablation techniques presents a noteworthy alternative to surgical intervention, as it yields comparable outcomes while minimizing the associated discomfort [4,5]. This research study aimed to compare the efficacy of open surgery, specifically venous

stripping, with radiofrequency ablation (RFA) in the treatment of varicose veins.

MATERIALS AND METHODS

A prospective study was conducted on a sample of 100 patients from the department of general surgery, encompassing both male and female individuals. The researchers obtained ethical clearance from the institutional ethical committee. All participants were provided with information about the study and written consent was obtained from each individual. Basic demographic data, including personal identifiers such as name, age, and gender, were documented. The

participants were allocated into two groups, each consisting of 50 individuals. Patients in Group A underwent open surgery involving venous stripping, while patients in Group B underwent radiofrequency ablation (RFA). The study compared various parameters, including bleeding, hematoma formation, blood transfusion requirements, postoperative inflammation, and length of hospital stay. The results obtained were subsequently subjected to statistical analysis. A significance level of less than 0.05 was used to determine statistical significance.

RESULTS

Table 1: gender and age of the patients

Parameter	Group A	Group B
Gender		
Male	29(58%)	27(54%)
Female	21(42%)	23(46%)
Age (Mean in years)	37.58±3.69	38.58±3.74

Table: 1 shows that there were 29(58%) males and 21(42%) females in group A and 27(54%) males and 23(46%) females in group B.

Table 2: Comparison of parameters

Groups	Group A	Group B	P value
Duration of surgery (minutes)	56.11±3.61	17.11±2.11	0.01
Blood requirement	2(4%)	0(0%)	0.03
Hospital stay (Days)	4.77±0.88	1.33±0.22	0.05

Table: 2 shows that mean duration of surgery in group A was 56.11±3.61 minutes and in group B was 17.11±2.11 minutes. Hospital stay was 4.77±0.88 days in group A and 1.33±0.22 days in group B. The difference was significant ($P < 0.05$).

Table 3: Complications

Complications	Group A	Group B	P value
Bleeding	13(26%)	2(4%)	0.03
Hematoma	7(14%)	2(4%)	0.05
Inflammation	44(88%)	3(6%)	0.002

Table: 3 shows that common complications were bleeding seen 13(26%) in group A and 2(4%) in group B, hematoma seen 7(14%) in group A and 2(4%) in group B and inflammation seen 44(88%) in group A and 3(6%) in group B. The difference was significant ($P < 0.05$).

DISCUSSION

The underlying principle of both procedures is to eliminate the incompetent veins from the venous circulation in order to alleviate venous hypertension, leading to the subsequent resolution of symptoms with minimal morbidity. The reduction of postoperative pain is significantly lower in radiofrequency ablation (RFA) compared to traditional surgical procedures. The duration of medical leave was comparatively reduced in the group subjected to the RFA intervention. The rate of recovery of physical activity is found to be higher in the radiofrequency ablation (RFA) group compared to the surgical intervention group. The venous severity score and improvement in CEAP score exhibited comparable results for both groups. No instances of recurrence were observed in either of the groups. The duration of surgery and

radiofrequency ablation (RFA) procedures exhibited a comparable timeframe. The definition of varicose veins lacks universal consensus. The term "varix" in Latin is used to denote the condition of an enlarged vein, artery, or lymphatic vessel. In everyday language, the term "varix" is commonly employed to refer to a vein, while "varicosity" is used to describe a vein that has increased in diameter and become tortuous. Varicose veins are a type of superficial veins found in the lower limb that have experienced a loss of valvular function. This loss of function leads to the development of venous hypertension, which subsequently causes the veins to become dilated, thickened, and tortuous [6]. There is a paucity of corroborating evidence in support of the notion of inherited infection. Children who have two guardians affected by varicose veins have an increased

likelihood of developing the condition. The prevalence of varicose veins increases with advancing age. It is evident that females exhibit a greater propensity for developing varicosities compared to males.[7] When there is obstruction in the deep vein, blood is redirected towards the superficial system, leading to gradual expansion, elongation, and damage to the valves, resulting in the development of varicose veins. Various factors contribute to the development of varicosities, including stature, race, occupation, body habits, abdominal mass exerting pressure on the veins, inherent weakness of vessel walls, and congenital absence of valves [8]. The present study conducted a comparative analysis between open surgery involving venous stripping and radiofrequency ablation (RFA) as treatment options for varicose veins. This study involved a sample size of 100 patients, which was divided into two equal groups of 50 individuals each. Patients in Group A underwent open surgery involving venous stripping, while patients in Group B underwent radiofrequency ablation (RFA). The RFA device is equipped with a bipolar RFA probe that incorporates two electrodes within a single probe, separated by an insulator. This probe is connected to a radiofrequency generator unit. The bipolar radiofrequency ablation (RFA) catheter-based approach involves the delivery of energy by a generator to the vein wall. This energy induces conductive heating, resulting in the contraction of the vein wall. This contraction leads to the shortening of collagen fibrils, destruction of endothelium, and fibrotic shrinkage of the venous lumen, ultimately causing the vein to shrink [9]. Brittenden et al conducted a study wherein patients were categorized into two groups: group I consisted of individuals who underwent open surgical intervention for the treatment of venous stripping [10]. Group II consisted of 104 individuals who underwent radiofrequency ablation (RFA). The majority of the patients in our study fall within the age range of 25-45 years, with a mean age of 37.58 ± 3.69 years in group A and 38.58 ± 3.74 years in group B. In the present study, the composition of group A consisted of 29 male participants and 21 female participants, while group B comprised 27 male participants and 23 female participants. The average duration of surgery in group A was 56.11 ± 3.61 minutes, while in group B it was 17.11 ± 2.11 minutes. The duration of hospitalization for group A was found to be 4.77 ± 0.88 days, whereas for group B it was 1.33 ± 0.22 days. The observed discrepancy exhibited statistical significance ($P < 0.05$). The occurrence of complications in the two groups was as follows: Group A experienced bleeding in 13 cases, while Group B had 2 cases. Hematoma was observed in 7 cases in Group A and 2 cases in Group B. Inflammation was reported in 44 cases in Group A and 3 cases in Group B. The observed discrepancy exhibited statistical significance at a level of significance of less than 0.05. The study conducted by Michaels et al. [11] determined that patients with

uncomplicated varicose veins who underwent surgical management experienced a significantly improved prognosis compared to those who received conservative treatment.

CONCLUSION

Our study revealed that conservative management utilizing radiofrequency ablation (RFA) demonstrated superior outcomes when compared to open surgery involving venous stripping.

REFERENCES

1. 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.
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. Kanber EM, Cetin HK. Comparison of Radiofrequency Ablation and Saphenous Vein Stripping for the Treatment of Recurrent Lower Extremity Venous Insufficiency. *Vascular and Endovascular Surgery.* 2023;0(0).
4. Youn YJ, Lee J. Chronic venous insufficiency and varicose veins of the lower extremities. *Korean J Intern Med.* 2019;34(2):269-283.
5. Azar J, Rao A, Oropallo A. Chronic venous insufficiency: a comprehensive review of management. *J Wound Care.* 2022;31:510-519
6. Kistner RL, Ferris E. The evolving management of varicose veins. *Straub clinic experience. Postgrad Med.* 1986;80:56-9
7. 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.
8. Wright AP, Berridge DC, Scott DJ. Return to work following varicose vein surgery: influence of type of operation, employment and social status. *Eur J vas Endovas Surg.* 2006;31:553-7.
9. Meissner M. Lower extremity venous anatomy, *Semin. Intervent Radiol.* 2005;22:147-56.
10. 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.
11. Michaels JA, et al. Randomized clinical trial comparing surgery with conservative treatment for uncomplicated varicose veins. *BJS.* 2000; 175-81