e-ISSN: 0975-5160, p-ISSN: 2820-2651

Available online on www.ijtpr.com

International Journal of Toxicological and Pharmacological Research 2023; 13(10); 479-482

Original Research Article

Comparative Evaluation of Open Surgery versus Endovenous Laser Ablation in the Treatment of Varicose Veins: A Comparative Study

Ansari Majid Akhtar Gulam Mohammad

Assistant Professor, Department of Surgery, Prathima Institute of Medical Sciences, Karimnagar, Nagunur, Karimnagar, Telangana, India

Received: 07-08-2023 / Revised: 16-09-2023 / Accepted: 23-10-2023
Corresponding Author: Dr. Ansari Majid Akhtar Gulam Mohammad
Conflict of interest: Nil

Abstract

Background: Varicose veins are one of the most prevalent chronic venous conditions of the lower extremities with a major impact on quality of life. Saphenofemoral ligation and vein stripping (conventional surgery) has long been regarded as the standard treatment. Endovenous laser ablation (EVLA), a minimally invasive option, has also come to light as a promising alternative technique with good clinical results. The purpose of this study was to evaluate the effectiveness, safety and postoperative results for open surgery versus endovenous laser ablation in patients with varicose veins.

Materials and Methods: A prospective comparative study was done in 80 patients with symptomatic primary varicose veins caused by incompetence in great saphenous veins. 40 patients were treated with conventional open surgery and 40 with EVLA. Operative time, postoperative pain, hospital stay, complications, return to normal activity, recurrence and Venous Clinical Severity Score (VCSS) were assessed. Follow-up was performed for 12 months.

Results: The mean operative time in the EVLA group was significantly less (58.6 ± 12.4 min) than in the surgery group (84.2 ± 15.8 min) ($p<0.001$). Postoperative pain scores, hospital stay and return to work time were significantly reduced in the EVLA group. The surgery group had a higher incidence of early postoperative complications. Both groups had good improvements in VCSS, with EVLA having better patient satisfaction. In one year, there was no significant difference in recurrence rates between the groups.

Conclusion: Compared with traditional surgery, endovenous laser ablation is a safe, effective treatment for varicose veins that results in less post-surgical pain, shorter hospital stay, quicker recovery, and similar recurrence rates. EVLA can be considered as the optimal treatment approach in selected patients.

Keywords: For instance, varicose veins are treated with Endovenous laser ablation, Vein stripping or surgery, depending on the severity of the condition and chronic venous insufficiency.

Introduction

Varicose vein is dilated, tortuous and elongated superficial veins due to valvular incompetence and venous hypertension. They are among the most frequent symptoms of chronic venous disease and occur in about 20-30% of the adult population in the world [1]. This condition is symptomatic, with pain, heaviness, swelling, itching, and venous ulceration being the common symptoms, which have a significant impact on quality of life [2].

Varicose veins are caused by dysfunction of venous valves causing reflux and chronic venous hypertension. The risk factors are age, female sex, obesity, long-term standing, pregnancy, family history and sedentary lifestyle [3].

The great saphenous vein (GSV) is the most commonly affected vein. Duplex ultrasonography has emerged as the most reliable tool for the diagnosis of venous reflux, the mapping of venous anatomy, and the planning of venous treatment, and is now the diagnostic modality of choice [4].

Traditional surgery involves a saphenofemoral junction ligation and stripping of the great saphenous vein, and it was long believed to be the best surgical approach to untreated varicose veins [5]. Surgical treatment is effective but has the disadvantages of postoperative pain, hematoma, nerve injury, slow recovery and admission.

With the progress of the minimally invasive vascular interventions, endovenous techniques have been developed. Endovenous laser ablation (EVLA) was developed as an alternative that was less invasive and involved the thermal energy to cause "laser" damage to the vein wall and occlusion [6]. The process is done with the help of ultrasound guidance and is often done as a day care procedure.

Excellent occlusion rates have been shown in several randomized controlled trials (RCTs) using EVLA. Furthermore, the pain following EVLA is typically less, recovery is quicker and cosmetic results are better than with traditional surgery [7].

Endothermal ablation techniques are recommended as first line of treatment for symptomatic truncal venous reflux to the extent possible [8], by the National Institute for Health and Care Excellence (NICE). However, open surgery is still widely used particularly in resource-limited areas.

Comparative evaluation of these treatment modalities is important to guide clinical decision-making. Surgery is effective and economical, but EVLA has benefits with regard to recovery and patient comfort. Long-term recurrence and clinical outcomes remain to be investigated [9].

This study aimed to assess the effectiveness, safety, recovery and recurrence of open surgery and endovenous laser ablation in patients with primary varicose veins.

Aim: To compare the clinical results between open surgery and endovenous laser ablation for varicose veins.

Objectives

1. To compare the recovery, complication and recurrence rates after open surgery versus EVLA.
2. To assess the clinical severity and the quality of life of patients after both treatment modalities.

Materials and Methods

Two years of a prospective comparative study were carried out in the Department of General Surgery. Eighty patients with primary varicose veins of the great saphenous vein who had symptoms were enrolled. The patients were divided into two groups: 40 patients were treated with conventional surgery (saphenofemoral ligation and stripping) (Group A), and 40 patients were treated with ultrasound-guided endovenous laser ablation (Group B).

Preoperative evaluation consisted of clinical examination, CEAP classification, duplex venous mapping, and Venous Clinical Severity Score (VCSS). Patients were followed-up after 1 month, 6 months, and 12 months from the treatment. Operative time, postoperative pain (visual analog scale [VAS] score), hospital stay, return to work, complications, recurrence, and VCSS improvement were all evaluated.

Inclusion Criteria

- Age 18–70 years.
- Primary varicose veins with symptoms.
- The great saphenous vein (GSV) was found to have reflux on duplex ultrasound.
- CEAP class C2–C6.

Exclusion Criteria

- Deep vein thrombosis.
- Secondary varicose veins.
- Peripheral arterial disease.
- Pregnancy.
- Previous venous surgery.
- Coagulopathy.

The statistical analysis was done using SPSS version 25. Student's t-test was used for the analysis of continuous variables and Chi-square test was used for the analysis of categorical variables. A p-value <0.05 was considered statistically significant.

Results

Table 1: Baseline Characteristics of Study Participants

Variable	Open Surgery (n=40)	EVLA (n=40)	p-value
Mean Age (Years)	46.8 ± 11.2	45.3 ± 10.6	0.54
Male (%)	27 (67.5)	25 (62.5)	0.64
Mean BMI (kg/m²)	27.4 ± 3.2	26.9 ± 3.5	0.48
Mean GSV Diameter (mm)	8.4 ± 1.2	8.1 ± 1.4	0.37

Both groups were comparable regarding demographic and disease characteristics.

Table 2: Comparison of Perioperative Outcomes

Outcome	Open Surgery	EVLA	p-value
Operative Time (min)	84.2 ± 15.8	58.6 ± 12.4	<0.001
Hospital Stay (Days)	3.8 ± 1.1	1.2 ± 0.5	<0.001
VAS Pain Score	6.8 ± 1.3	3.4 ± 1.1	<0.001
Return to Work (Days)	15.6 ± 4.2	5.8 ± 2.1	<0.001

EVLA was associated with significantly shorter operative time, less pain, reduced hospitalization, and earlier return to work.

Table 3: Postoperative Complications and Recurrence

Outcome	Open Surgery n (%)	EVLA n (%)	p-value
Hematoma	8 (20.0)	2 (5.0)	0.04
Wound Infection	4 (10.0)	0 (0)	0.04
Nerve Injury	3 (7.5)	1 (2.5)	0.30
Recurrence (12 Months)	3 (7.5)	2 (5.0)	0.64

Early complications were more common following surgery, while recurrence rates were comparable at one year.

Discussion

Varicose veins are a common vascular disorder requiring effective intervention to alleviate symptoms and prevent complications. The present study compared conventional surgery and endovenous laser ablation in patients with primary varicose veins.

The demographic characteristics of patients in both groups were comparable, ensuring a valid comparison of outcomes. The mean age and gender distribution were similar to those reported in previous studies of chronic venous disease [10].

A significant reduction in operative time was observed in the EVLA group. Similar findings have been reported by Rasmussen et al., who demonstrated shorter procedure duration and improved perioperative efficiency with endovenous techniques [11].

Postoperative pain scores were significantly lower following EVLA. This observation is consistent with randomized trials by Darwood et al. and Brittenden et al., who reported reduced tissue trauma and improved patient comfort after endovenous procedures [12,13]. The minimally invasive nature of EVLA avoids extensive dissection and stripping, thereby reducing postoperative discomfort.

Hospital stay was substantially shorter among EVLA patients. Most procedures were performed as day-care interventions, whereas surgery required inpatient observation. Early ambulation and reduced postoperative morbidity contribute to shorter hospitalization and lower healthcare costs.

Return to normal activity was significantly faster in the EVLA group. This finding has important socioeconomic implications, particularly for working-age individuals. Previous studies have similarly demonstrated earlier return to work following endovenous therapy compared with surgery [14].

Complication rates were lower in the EVLA group. Hematoma formation and wound infections occurred predominantly among surgical patients because of larger incisions and tissue dissection. These findings correspond with reports from the EVOLVeS and CLASS trials [15,16].

Recurrence rates at one year were comparable between groups. This suggests that EVLA achieves efficacy equivalent to surgery while offering superior perioperative outcomes. Meta-analyses have reported long-term vein occlusion rates exceeding 90% following EVLA [17].

The strengths of the present study include prospective design and standardized follow-up. However, limitations include the relatively short follow-up period and single-center setting. Longer-term studies are required to assess recurrence beyond five years.

Overall, the findings support current international guidelines recommending endovenous thermal ablation as first-line treatment for great saphenous vein reflux. While conventional surgery remains an effective option, EVLA provides superior patient-centered outcomes and faster recovery.

Conclusion

Endovenous laser ablation (EVLA) is a minimally invasive, effective and safe treatment for varicose veins. EVLA has been shown to have a shorter surgical time, less pain after surgery, less hospital stay, quicker return to normal activity, and fewer complications when compared to traditional "open" surgery. Both procedures result in important clinical results and short-term recurrence rates are similar. The benefits of EVLA, in terms of recovery rate and patient satisfaction, make it a desirable option over traditional surgery. For the right patient, EVLA should be considered the preferred treatment in the case of great saphenous vein incompetence. Additional long term multicentric studies are needed to assess the durability of results and the rate of recurrence over a long-term follow-up.

References

1. Beebe-Dimmer JL, Pfeifer JR, Engle JS, Schottenfeld D. The epidemiology of chronic venous insufficiency and varicose veins. Ann Epidemiol. 2005;15(3):175-184.
2. Eberhardt RT, Raffetto JD. Chronic venous insufficiency. Circulation. 2014;130(4):333-346.
3. Callam MJ. Epidemiology of varicose veins. Br J Surg. 1994;81(2):167-173.
4. Labropoulos N, Leon LR Jr. Duplex evaluation of venous insufficiency. Semin Vasc Surg. 2005; 18(1):5-9.

5. Dwerryhouse S, Davies B, Harradine K, Earnshaw JJ. Stripping the long saphenous vein reduces the rate of stripping-site recurrence. J Vasc Surg. 1999;29(4):589-592.
6. Min RJ, Zimmet SE, Isaacs MN, Forrestal MD. Endovenous laser treatment of saphenous vein reflux: long-term results. J Vasc Interv Radiol. 2001;12(10):1167-1171.
7. Van den Bos RR, Neumann M, De Roos KP, Nijsten T. Endovenous therapies of lower extremity varicosities: a meta-analysis. J Vasc Surg. 2009;49(1):230-239.
8. National Institute for Health and Care Excellence. Varicose veins: diagnosis and management. NICE Guideline CG168. London: National Institute for Health and Care Excellence; 2013.
9. Gloviczki P, Comerota AJ, Dalsing MC, Eklof BG, Gillespie DL, Gloviczki ML, et al.; Society for Vascular Surgery; American Venous Forum. Guidelines for the management of varicose veins and associated chronic venous diseases. J Vasc Surg. 2011;53(5 Suppl):2S-48S.
10. Evans CJ, Fowkes FG, Ruckley CV, Lee AJ. Prevalence of varicose veins and chronic venous insufficiency in men and women in the general population: Edinburgh Vein Study. J Epidemiol Community Health. 1999; 53(3): 149-153.
11. Rasmussen LH, Bjoern L, Lawaetz M, Blemings A, Eklof B. Randomized trial comparing endovenous laser ablation, radiofrequency ablation, foam sclerotherapy and surgical stripping for great saphenous varicose veins. Br J Surg. 2011;98(8):1079-1087.
12. Darwood RJ, Theivacumar N, Dellagrammaticas D, Mavor AI, Gough MJ. Randomized clinical trial comparing endovenous laser ablation with surgery for the treatment of primary great saphenous varicose veins. Br J Surg. 2008;95(3):294-301.
13. 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. 2014;371(13):1218-1227.
14. Carradice D, Mekako AI, Mazari FA, Samuel N, Hatfield J, Chetter IC. Randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins. Br J Surg. 2011;98(4):501-510.
15. Lurie F, Creton D, Eklof B, Kabnick LS, Kistner RL, Pichot O, et al. Prospective randomised study of endovenous radiofrequency obliteration (closure) versus ligation and vein stripping (EVOLVeS): two-year follow-up. Eur J Vasc Endovasc Surg. 2005;29(1):67-73.
16. Brittenden J, Cooper D, Dimitrova M, Scotland G, Cotton SC, Elders A, et al. Five-year outcomes of a randomized trial of treatments for varicose veins. N Engl J Med. 2019; 381(10): 912-922.
17. Nesbitt C, Bedenis R, Bhattacharya V, Stansby G. Endovenous ablation (radiofrequency and laser) and foam sclerotherapy versus conventional surgery for great saphenous vein varices. Cochrane Database Syst Rev. 2014; 2014(7): CD005624.