



INTERVENTIONAL PROCEDURES FOR SAPHENOFEMORAL JUNCTION INCOMPETENCE – A REVIEW

General Surgery

Dr Bhuvana Lakshmi Sundararajan

Junior Resident, Department of General Surgery, Mahatma Gandhi Medical College and Research Institute

Dr Elamaram E.*

Assistant Professor, Department of Thoracic and Vascular Surgery, Mahatma Gandhi Medical College and Research Institute*Corresponding Author

Dr Ramanathan M

Professor, Department of General Surgery, Mahatma Gandhi Medical College and Research Institute

ABSTRACT

Varicose veins are a commonly encountered problem in India. Surgical management is the standard treatment. Options include open surgery as well as newer, less-invasive techniques. This study aimed to review the various surgical techniques currently available. A digital search was carried out in PubMed to obtain articles that evaluated interventions for varicose veins due to saphenofemoral junction incompetence over the past decade. After exclusion criteria applied, totally 20 articles were chosen and reviewed. The most popular are Endothermal ablation techniques. They had similar or better outcomes than conventional open surgery, with lesser adverse effects, in both short- and long-term. They may become the standard of care, however widespread use is limited due to high monetary cost for the patient. Non-thermal ablative procedures have similar outcomes in the short-term. In open surgery, removal of GSV without ligation at SFJ was found to lead to low recurrence rates.

KEYWORDS

INTRODUCTION

Around one-third of the population is estimated to have venous insufficiency of some stage. Varicose veins are one of the more common problems that patients present with, particularly in southern India. In addition to the cosmetic problem of dilated tortuous veins, affected people may develop pain, oedema, lipodermatosclerosis, ulceration, bleeding. These symptoms impair day-to-day life. Surgical management is the standard treatment for patients with advanced symptoms and/or patients concerned about cosmesis. Options include open surgery such as Trendelenburg operation and newer, less invasive methods like microphlebectomy, foam sclerotherapy, radiofrequency ablation etc. The purpose of this study is to review the various surgical techniques currently available for treatment of saphenofemoral junction incompetence.

METHODOLOGY:

The basis of the search were articles cited in PubMed. Key words used for search were “saphenofemoral junction incompetence”. Articles evaluating interventions for varicose veins due to saphenofemoral junction incompetence were included for the review. Abstracts were screened and corresponding full-text papers were obtained. Animal studies, articles in languages other than English and articles published before January 2010 were excluded. Articles for which full text papers could not be accessed were excluded. Observational studies of epidemiology, etiopathogenesis, risk factors, clinical features and diagnostic methods were excluded. Articles assessing management of reticular veins, telangiectasia and post-operatively recurrent varicose veins were also excluded.

151 articles were found on the initial search. After exclusion criteria applied, 20 articles were chosen and reviewed.

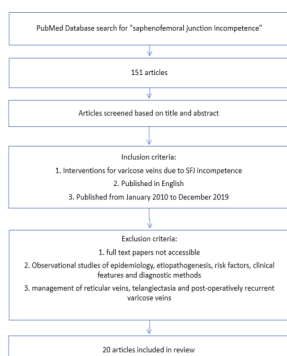


Table :1 Review Matrix (RCT: Randomised control trial, RFA: Radiofrequency ablation, EVLA: Endovenous laser ablation, HL+S: High ligation + stripping of GSV, CAE: cyanoacrylate embolization, UGFS: ultrasound guided foam sclerotherapy)

Title of study	Type of study	Interventions studied	Conclusion
Changes in Saphenous Vein Stump and Low Incidence of Endovenous Heat-Induced Thrombosis After Radiofrequency Ablation of Great Saphenous Vein Incompetence	Prospective	RFA	Adequate positioning of RFA catheter tip is recommended to decrease the incidence of EHIT.
Single-visit endovenous laser treatment and tributary procedures for symptomatic great saphenous varicose veins	Retrospective	EVLA, Phlebectomy	The short-term GSV ablation rates were excellent. Overall mid-term review of patients has shown a well received single-visit service with concomitant phlebectomy or endovenous ablation, and good ablation and patient satisfaction rates.
Randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins	RCT	EVLA, HL+S	EVLA was as effective as surgery for varicose veins, but had a less negative impact on early postintervention quality of life.
Clinical and technical outcomes from a randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins	RCT	EVLA, HL+S	EVLA treatment had lower rates of clinical recurrence than conventional surgery in the short term.

Title of study	Type of study	Interventions studied	Conclusion
Changes in Saphenous Vein Stump and Low Incidence of Endovenous Heat-Induced Thrombosis After Radiofrequency Ablation of Great Saphenous Vein Incompetence	Prospective	RFA	Adequate positioning of RFA catheter tip is recommended to decrease the incidence of EHIT.
Single-visit endovenous laser treatment and tributary procedures for symptomatic great saphenous varicose veins	Retrospective	EVLA, Phlebectomy	The short-term GSV ablation rates were excellent. Overall mid-term review of patients has shown a well received single-visit service with concomitant phlebectomy or endovenous ablation, and good ablation and patient satisfaction rates.
Randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins	RCT	EVLA, HL+S	EVLA was as effective as surgery for varicose veins, but had a less negative impact on early postintervention quality of life.
Clinical and technical outcomes from a randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins	RCT	EVLA, HL+S	EVLA treatment had lower rates of clinical recurrence than conventional surgery in the short term.

DISCUSSION:

The most popular is Endothermal ablation. This includes two techniques – Endovenous laser ablation and Radiofrequency Ablation. They are similar - a device introduced into the diseased vein releases thermal energy, occluding the lumen by damaging the vein's structure. Tumescence anaesthesia is usually infiltrated around the length of the vein to compress its lumen and to protect nearby tissues from thermal damage. This review found that endothermal ablation techniques had similar or better outcomes than conventional open surgery, with lesser adverse effects, in both short- and long-term. EVLA was also the most commonly studied procedure in the past decade.

Injection of a sclerosing agent into the veins is a lower-cost and less painful procedure for the patient. However, higher rates of complications and long-term recurrence have been reported. This review found that polidocanol and foam sclerotherapy were both safe and showed satisfactory outcomes in the short term. Embolisation of the vein with cyanoacrylate glue was also found to be safe and effective in the short term; with recurrence rates similar to endothermal ablation. One article studied a mechanochemical ablative device, finding it to be safe and effective, with lower pain score and operating time than endothermal techniques.

The conventional surgical option has been high ligation at the SFJ with stripping of the GSV. One study indicated that removal of GSV, unaccompanied by high ligation, can still be effective, and in fact, may have lower recurrence rates. Another technique studied was placement of PTFE patch after ligation, which also reduced rates of recurrence. Less invasive ablative techniques are shown to be equally or more effective than open surgery. However, they also tend to be more expensive and technically demanding, hence, open surgery still plays a large role in varicose vein management.

CONCLUSION

Endovenous laser ablation appears to be most popularly studied techniques. Endothermal ablation techniques have better outcome and

lesser adverse effects than conventional surgery and other ablative techniques. Endothermal procedures may eventually become the standard of care, however widespread use is currently limited due to high monetary cost for the patient.

CONFLICT OF INTEREST

The authors have no conflict of interest

REFERENCES

- Chetter IC, Carradice D. Venous disorders. In: Williams NS, O'Connell PR, McCaskie AW, editors. *Bailey and Love's short practice of surgery*. 27th ed. CRC Press, Taylor and Francis Group; 2018.
- Malhotra SL. Study of Varicose Veins In Indian Railroad Workers from the South and North of India, with Special Reference to the Causation and Prevention of Varicose Veins. *Int J Epidemiol*.:7.
- Agarwal V, Agarwal S, Singh A, Nathwani P, Goyal P, Goel S. Prevalence and risk factors of varicose veins, skin trophic changes, and venous symptoms among northern Indian population. *Int J Res Med Sci*. 2016;1678–82.
- Barwell JR, Davies CE, Deacon J, Harvey K, Minor J, Sassano A, et al. Comparison of surgery and compression with compression alone in chronic venous ulceration (ESCHAR study): randomised controlled trial. *The Lancet*. 2004 Jun 5;363(9424):1854–9.
- Gohel MS, Barwell JR, Taylor M, Chant T, Foy C, Earnshaw JJ, et al. Long term results of compression therapy alone versus compression plus surgery in chronic venous ulceration (ESCHAR): randomised controlled trial. *BMJ*. 2007 Jul 14;335(7610):83.
- Ahn S, Jung IM, Chung JK, Lee T. Changes in Saphenous Vein Stump and Low Incidence of Endovenous Heat-Induced Thrombosis After Radiofrequency Ablation of Great Saphenous Vein Incompetence. *Dermatol Surg Off Publ Am Soc Dermatol Surg AI*. 2016 Apr;42(4):515–20.
- Alder LS, Rahi MA. Single-visit endovenous laser treatment and tributary procedures for symptomatic great saphenous varicose veins. *Ann R Coll Surg Engl*. 2014 May;96(4):279–83.
- Carradice D, Mekako AI, Mazari F a. K, 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 Apr;98(4):501–10.
- Carradice D, Mekako AI, Mazari F a. K, Samuel N, Hatfield J, Chetter IC. Clinical and technical outcomes from a randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins. *Br J Surg*. 2011 Aug;98(8):1117–23.
- Casoni P, Lefebvre-Vilardebo M, Villa F, Corona P. Great saphenous vein surgery without high ligation of the saphenofemoral junction. *J Vasc Surg*. 2013 Jul;58(1):173–8.
- Chan YC, Law Y, Cheung GC, Ting AC, Cheng SW. Cyanoacrylate glue used to treat great saphenous reflux: Measures of outcome. *Phlebology*. 2017 Mar;32(2):99–106.
- Deijen CL, Schreve MA, Bosma J, de Nie AJ, Leijdekkers VJ, van den Akker PJ, et al. Clarivein mechanochemical ablation of the great and small saphenous vein: Early treatment outcomes of two hospitals. *Phlebology*. 2016 Apr;31(3):192–7.
- Doganci S, Demirkilic U. Comparison of 980 nm laser and bare-tip fibre with 1470 nm laser and radial fibre in the treatment of great saphenous vein varicosities: a prospective randomised clinical trial. *Eur J Vasc Endovasc Surg Off J Eur Soc Vasc Surg*. 2010 Aug;40(2):254–9.
- Gauw SA, Lawson JA, van Vlijmen-van Keulen CJ, Pronk P, Gastra MTW, Mooij MC. Five-year follow-up of a randomized, controlled trial comparing saphenofemoral ligation and stripping of the great saphenous vein with endovenous laser ablation (980 nm) using local tumescent anesthesia. *J Vasc Surg*. 2016 Feb;63(2):420–8.
- Gibson K, Kabnick L, Varithena® 013 Investigator Group. A multicenter, randomized, placebo-controlled study to evaluate the efficacy and safety of Varithena® (polidocanol endovenous microfoam 1%) for symptomatic, visible varicose veins with saphenofemoral junction incompetence. *Phlebology*. 2017 Apr;32(3):185–93.
- Harlander-Locke M, Jimenez JC, Lawrence PF, Derubertis BG, Rigberg DA, Gelabert HA. Endovenous ablation with concomitant phlebectomy is a safe and effective method of treatment for symptomatic patients with axial reflux and large incompetent tributaries. *J Vasc Surg*. 2013 Jul;58(1):166–72.
- McGuinness B, Elias F, Ali KP, Ahmad MS, Namburi J, Chan B, et al. A comparison of duplex ultrasound findings after cyanoacrylate embolization versus endovenous laser ablation of the great saphenous vein. *J Vasc Surg Venous Lymphat Disord*. 2019 Nov;7(6):824–31.
- Mishra MK, Soni RK, Mohil RS, Sinha A. Comparative Study of Outcome of Duplex Ultrasound-Guided, Catheter-Directed Foam Sclerotherapy and Radio-frequency Ablation in the Management of Great Saphenous Varicose Veins. *Indian J Surg*. 2016 Oct;78(5):375–81.
- Samuel N, Wallace T, Carradice D, Mazari FAK, Chetter IC. Comparison of 12-w versus 14-w endovenous laser ablation in the treatment of great saphenous varicose veins: 5-year outcomes from a randomized controlled trial. *Vasc Endovascular Surg*. 2013 Jul;47(5):346–52.
- Spreatico G, Kabnick L, Berland TL, Cayne NS, Maldonado TS, Jacobowitz GS, et al. Laser saphenous ablations in more than 1,000 limbs with long-term duplex examination follow-up. *Ann Vasc Surg*. 2011 Jan;25(1):71–8.
- Too TKB, Tay KH, Lin SE, Tan SG, Lo RH, Taneja M, et al. Endovenous laser therapy in the treatment of lower-limb venous ulcers. *J Vasc Interv Radiol JVIR*. 2010 May;21(5):657–62.
- Todd KL, Wright DI, VANISH-2 Investigator Group. Durability of treatment effect with polidocanol endovenous microfoam on varicose vein symptoms and appearance (VANISH-2). *J Vasc Surg Venous Lymphat Disord*. 2015 Jul;3(3):258–264.e1.
- Vashist MG, Singhal N, Verma M, Sen J. Role of PTFE Patch Saphenoplasty in Reducing Neovascularization and Recurrence in Varicose Veins. *Indian J Surg*. 2015 Dec;77(Suppl 3):1077–82.
- Vun SV, Rashid ST, Blest NC, Spark JJ. Lower pain and faster treatment with mechanochemical endovenous ablation using ClariVein®. *Phlebology*. 2015 Dec;30(10):688–92.
- Wallace T, El-Sheikha J, Nandhra S, Leung C, Mohamed A, Harwood A, et al. Long-term outcomes of endovenous laser ablation and conventional surgery for great saphenous varicose veins. *Br J Surg*. 2018;105(13):1759–67.