

# Purely Endovenous Polytherapy for Varicose Veins - How Good is It?

Sitaram Barath<sup>1</sup>, Hari Ram<sup>2</sup>, PiyushPadhiyar<sup>3</sup>

## ABSTRACT

**Introduction:** Varicose veins are common disorder causing leg pain, blue veins and ulcer in humans. Varicose veins produce symptoms due to junctional incompetence, perforator incompetence or both. In a unique combination of treatment modality we have used RFA for large vein ie GSV and SSV, glue embolization for incompetent perforator and sclerotherapy for superficial varicosity. In our mind Combination of these therapies have synergistic action and better short term and long term outcome and our aim is to find the same.

**Material and methods:** Study was done in department of radiology Geetanjali Medical College and Hospital, Udaipur from January 2019 to July 2019. Patients with varicose veins who underwent combination polytherapy in interventional radiology subdivision of were included in the study. Closure fast RFA system with 7cm ablation zone catheter from Medtronic was used in all cases.

**Results:** In our study of 27 patients all had leg pain and visible varicosity as presenting symptoms 15 patients had pain with venous edema and 12 patients had active ulcers. On follow up at 1 month 11 patient had ulcer healing mean duration was 2 weeks 1 patient had to undergo skin grafting. At 6 months follow up 2 patients had residual symptomatic varicosity and segmental recanalization of GSV. The long term obliteration rate was 92.59%. 5 patients had mild leg pain on prolonged standing. Complications were bruising of overlying skin in 5 patients but none had ulceration. Thrombophlebitis in 1 patient and transient paraesthesia in 3 patients however none had permanent deficits. We did not record any DVT.

**Conclusion:** For treatment of varicose veins especially in the presence of venous stasis ulcers, treatment with triple combination therapy is associated with faster ulcer healing and lower recurrence rate of ulcer as well as varicosities.

**Keywords:** Varicose, RFA, Glue, Sclerotherapy

## INTRODUCTION

Varicose veins are common disorder causing leg pain, blue veins and ulcers in humans. Varicose veins produce symptoms due to junctional incompetence, perforator incompetence or both.

An epidemiological survey carried out on Indian railroad workers determined the prevalence of varicose veins to be 25% in South India and 6.8% in North India.<sup>1</sup>

The treatment of varicose veins has undergone marked evolution since the introduction of percutaneous endovenous ablation techniques, including endovenous laser therapy (EVLA), radiofrequency ablation (RFA), and foam sclerotherapy.<sup>2</sup>

These techniques are percutaneous office-based procedures that can be performed under local or tumescent anesthesia with nearly equal early and midterm results and with less

discomfort to the patient, improved early quality of life, and earlier return to work.<sup>3-5</sup> In a unique combination of treatment modalities we have used RFA for large vein i.e. GSV and SSV, glue embolization for incompetent perforators and sclerotherapy for superficial varicosities. In our mind Combination of these therapies in single sitting have synergistic action and better short term and long term outcome and our aim is to find the same.

## MATERIAL AND METHODS

Patients with varicose veins who underwent combination polytherapy in interventional radiology subdivision of department of radiology Geetanjali Medical College and Hospital, Udaipur from January 2019 to July 2019 were included in the study.

This study was approved by the ethics committee of our institution and written informed consent of patients was obtained.

History taking and examination was done for leg pain or cramps, visible varicose veins, ulcers and Lipodermatosclerosis.

Doppler evaluation was done to look for SFJ or SPJ Incompetence as well as size of the small or great saphenous vein. In addition Incompetence was also checked for antero-lateral and postero-medial thigh vein. Presence of incompetent perforators and varicosity was documented.

## Inclusion criteria

Patients with Doppler evidence of an incompetent SFJ or SPJ and reflux into the GSV or SSV (more than 0.5 s) were included in study.

## Exclusion criteria

Chronic deep venous thrombosis, and pregnancy associated varicose veins were excluded.

## Equipment

Closure fast RFA system (figure 1) with 7cm ablation zone catheter from Medtronic was used in all cases. This

<sup>1</sup>Assistant Professor, Department of Radiodiagnosis Geetanjali Medical College and Hospital Udaipur Rajasthan, <sup>2</sup>Associate Professor, Department of Radiodiagnosis Geetanjali Medical College and Hospital Udaipur Rajasthan, <sup>3</sup>Resident, Department of Radiodiagnosis Geetanjali Medical College and Hospital Udaipur Rajasthan, India

**Corresponding author:** Dr Sitaram Barath AS-1 Geetanjali University Campus, Manvakhera, Udaipur 313002, India

**How to cite this article:** Sitaram Barath, Hari Ram, PiyushPadhiyar. Purely endovenous polytherapy for varicose veins- how good is it?. International Journal of Contemporary Medical Research 2020;7(7):G1-G4.

**DOI:** <http://dx.doi.org/10.21276/ijcmr.2020.7.7.15>



has controlled feedback mechanism which monitors intravascular heat parameters in real time to automatically regulate therapeutic power.

#### Procedure steps

1. Preoperatively patient was kept Nil by mouth for 8 hours. The leg was shaved. lidocaine and prilocraine cream was applied on the leg over the GSV, SSV and visible varicose veins 30 minutes before the procedure.
2. The patient was kept supine on the table. Intravenous sedation in the form of nalbuphine and midazolam was used in the majority of patients. Few of the patients who were pain sensitive required total intravenous anaesthesia.
3. For GSV ablation the leg was externally rotated and for SSV ablation leg was elevated on cloth pad and partially flexed at the knee joint. The puncture for GSV access was made at the junction of upper one third and lower two thirds leg to avoid injury to the saphenous nerve. For SSV puncture was made at mid leg.
4. 7 French sheath was placed in the vein. Patency of the deep venous system was confirmed by venogram. Closure fast RFA catheter was placed 4 centimetres below the junction.(figure 2a)
5. Perivenous tumescent anaesthesia 1 by 20 dilution of 2% lignocaine and normal saline was infiltrated around the saphenous vein from puncture site up to the junction.
6. The ablation was done at 120 degree centigrade for 20 seconds. Each cycle treated 7 cm of vein with 0.5 centimetre overlap. The cycle was repeated for the entire length of vein up to the puncture site.
7. Incompetent perforators were Embolised using nbc glue. The glue was filled in 3 ml leurlock syringe up to the needle hub keeping little air in the needle. The perforator was punctured where it connected with the superficial varicose vein under ultrasound guidance. Initial air injected to confirm intravascular position of needle followed by small Aliquot of glue injection.
8. For sclerotherapy 24 gauge scalp vein was placed in the varicosity under ultrasound guidance and mapping was done using diluted non-ionic contrast media. STDS and air was mixed in equal amounts to make foam. This foam was injected in the varicosity under fluoroscopy guidance without refluxing in the deep system. (figure 2b)
9. Compression bandage was applied for 24 hours.
10. Subcutaneous enoxaparin single dose was given immediately after procedure. Patient was made Ambulatory within 2 hours.

Follow up was done at 7 days 1 month and six months.

#### STATISTICAL ANALYSIS

The data was processed in Microsoft XL, tabulation done, and statistical averages and relevant proportion were calculated. No further statistical tests was done due to small numbers of cases.

#### RESULTS

Out of 27 patients 23 were male and 4 were females. Age ranged from 21 years to 73 years. In our study of 27 patients all had leg pain and visible varicosity as presenting symptoms. 15 patients had pain with venous edema and 12 patients had active ulcers. 16 had left sided disease, 8 had right sided disease and 3 had bilateral disease.

Following the treatment there was immediate reduction in size of varicosities as evident in figure (3a and 3b)

Complications were bruising of overlying skin in 5 patients but none had ulceration. Thrombophlebitis in 1 patient and transient paraesthesia in 3 patients however none had permanent deficits. None of patients had DVT as complication.

On follow up at 1 month 11 patient had ulcer healing (figure 4) mean duration was 2 weeks 1 patient had to undergo skin grafting. At 6 months follow up 5 patients had mild leg pain on prolonged standing, 2 patients had residual symptomatic varicosity and 1 had segmental recanalization of GSV. The



**Figure-1:** Closure fast RFA system and catheter assembly



**Figure-2a:** shows puncture site for GSV with 7f sheath and RFA catheter in situ. The perivenous anaesthesia is infiltrated around GSV under USG guidance. **Figure-2b:** shows a scalp vein placed in varicosity through which STDS foam is injected after opacifying the vein.



**Figure-3a:** shows extensive varicosity in leg before procedure and **Figure-3b** shows significant reduction in varicosity next day post procedure which will further reduce over time.



**Figure-4a:** shows oozing ulcer before triple therapy and intermediate healing at 1 week follow up as seen in **Figure-4b** and complete healing as seen in **Figure-4c** at 2 weeks.

long term obliteration rate was 96.29%.

## DISCUSSION

Varicose veins produce symptoms due to junctional incompetence, perforator incompetence or combination of either in turn causing varicosity or ulceration. Combining the therapy taking care of each component would give the best result.

In multiple studies it is observed that additional form of treatment is required after thermal ablation alone more so in first 1 year.<sup>2</sup> For this reason same sitting polytherapy was done to avoid multiple sittings of treatment and repeated treatments.

Radiofrequency ablation is well established now for treatment of GSV and SSV reflux. The long term obliteration rate in our study is 96.29% which is comparable to Proebstle et al.<sup>6</sup> The principal hindrance is treatment of perforators, which requires a stylet probe in RFA or bare fibre for laser making it costly and cumbersome. Using direct access and glue injection is easy, quick and cost effective. Another advantage of perforator treatment in this manner prevents the foam from entering deep venous system during sclerotherapy.

The combination therapy gave superior ulcer healing rate of 91% at 1 month and 100% assisted ulcer healing rate. Study published by Ahamadkayasi et al showed 72% ulcer healing rate by RFA alone.<sup>7</sup>

By keeping the probe 4 cm below the junction we reduced incidence of DVT to 0%. The incidence of prolapse of

thrombus from the GSV into the deep venous system has ranged from 0% to 16% in various studies.<sup>8</sup> With the exception of the study by Marsh and colleagues<sup>9</sup> involving 2470 patients treated with RFA, with a DVT rate of 0.7%, and the study by Zuniga and colleagues<sup>10</sup> reporting on DVT only for first-generation catheters (3.5%), none of the other studies indicated the presence of DVT.

In our study reported incidence of paraesthesia was 11% which is similar to other studies done by Weissset al<sup>11</sup> and Welch et al<sup>12</sup> which mentioned 10-12% incidence. However with experience and visualisation of great saphenous nerve on ultrasound and by avoiding GSV puncture below upper 1/3<sup>rd</sup> of leg we were able to reduce it further during the later part of study.

## CONCLUSION

For treatment of varicose veins especially in the presence of venous stasis ulcers, combination polytherapy is associated with faster ulcer healing and lower recurrence rate of ulcer as well as varicosities. As this is the preliminary experience we will continue to evaluate more patients as well as see the long term results.

## REFERENCES

1. Malhotra SL. An epidemiological 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.* 1972;1:177-183.
2. Gloviczki P, Comerota AJ, Dalsing MC, Eklof BG, Gillespie DL, Gloviczki ML, et al. The care of patients with varicose veins and associated chronic venous diseases: clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum. *J Vasc Surg* 2011; 53:2S-48S.
3. Leopardi D, Hoggan BL, Fitridge RA, Woodruff PW, Maddern GJ. Systematic review of treatments for varicose veins. *Ann Vasc Surg* 2009; 23:264-276.
4. Murad MH, Coto-Yglesias F, Zumaeta-Garcia M, Elamin MB, Duggirala MK, Erwin PJ, et al. A systematic review and meta-analysis of the treatments of varicose veins. *J Vasc Surg* 2011; 53:51S-67S.
5. Meissner MH, Gloviczki P, Bergan J, Kistner RL, Morrison N, Pannier F, et al. Primary chronic venous disorders. *J Vasc Surg* 2007; 46:54S-67S.
6. Proebstle, T.M., Alm, B.J., Gockert, O., et al. Five-year Results from the Prospective European Multicentre Cohort Study on Radiofrequency Segmental Thermal Ablation for Incompetent Great Saphenous Veins. *BR J Surg.* 2015;102:212-8
7. Kayssi, Ahmed et al. The Impact of Endovenous Thermal Ablation on Venous Leg Ulcer Healing. *Journal of Vascular Surgery* 2018;66:e64-67.
8. Roth SM. Endovenous radiofrequency ablation of superficial and perforator veins. *SurgClin North Am* 2007;87:1267-84.
9. Marsh P, Price BA, Holdstock J, et al. Deep vein thrombosis (DVT) after venous thermoablation techniques: rates of endovenous heat-induced thrombosis (EHIT) and classical DVT after radiofrequency and

- endovenous laser ablation in a single centre. *Eur J Vasc Endovasc Surg* 2010;40:521-7.
10. Zuniga JM, Hingorani A, Ascher E, et al. Short-term outcome analysis of radiofrequency ablation using ClosurePlus vs ClosureFast catheters in the treatment of incompetent great saphenous vein. *J Vasc Surg* 2012;55:1048-51.
  11. Controlled Radiofrequency Endovenous Occlusion Using a Unique Radiofrequency Catheter under Duplex Guidance to Eliminate Saphenous Varicose Vein Reflux: A 2-Year Follow-Up Robert weiss; Margaret weiss; dermatologic surgery. 2002;28:38–42.
  12. Endovenous ablation of the great saphenous vein may avert phlebectomy for branch varicose veins Welch, Harold J. *Journal of Vascular Surgery* 2017;44:601 – 605

**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 30-05-2020; **Accepted:** 17-06-2020; **Published:** 09-07-2020