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Original Article

Comparative Study of Open Surgery and Radiofrequency Ablation in the Treatment of Varicose Veins

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Abstract

Introduction: *Varicose veins have been the commonest venous problem among us, and one of the many prices man must pay for gaining the erect posture. Though Surgery is the gold standard, the expansion of minimally invasive techniques has made the treatment of superficial venous reflux and varicose veins a rapidly evolving field. In this study we are comparing the efficacy and outcome of open surgery and Radio frequency ablation.*

Materials and Methods: *About 30 patients in each category of open surgery and RFA are followed in the department of general surgery and vascular surgery department in govt royapettahhospital, Kilpauk medical college for a period of two years. Focus will be on improvement in CEAP classification, post-operative pain scoring, number of days hospitalized and number of days to return to work.*

Result: *The most important difference noted among the two is in impact on hemodynamics, patient recovery and return to work, and in the treatment of recurrence. Though the outcome among the two procedures seems to be nearly equal, RFA is evolving to be the best for treating varicose veins.*

Keywords: *Radio frequency ablation (RFA), sapheno femoral junction (SFJ), closure catheters, Trendelenburg procedure.*

Introduction

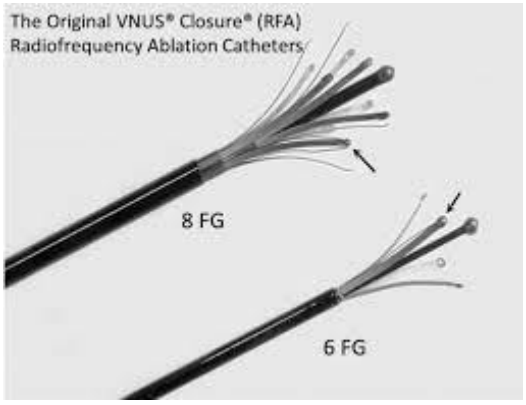
Varicose veins are the commonest problem that causes significant morbidity in the lower limbs and thus leads to increased health care cost. Symptoms include pain, itching, burning discomfort, swelling, postural cramps, night cramps, and further it may lead to ulcer formation which generally is difficult to heal. Surgery is the gold standard in the treatment of varicose veins, but RFA, Transilluminated power phlebectomy (Tipp), Foamsclerotherapy, Endovenous laser therapy are newer minimally invasive techniques that are available for the treatment of varicose veins. Of these the most accepted in the treatment of varicose veins is radio frequency ablation.

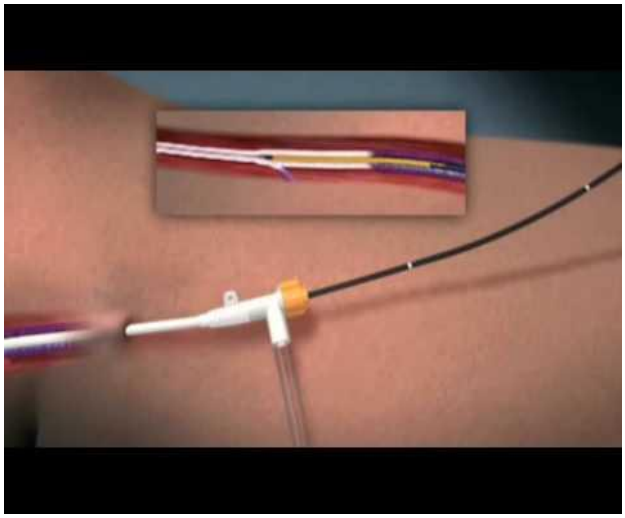
Our Aim and Objectives

1. To access the obliteration of the superficial venous systems following the two procedures

2. To compare the outcome between them at the end of three months
3. To compare the clinical stay and return to work after the procedure.

The surgical procedure done is Trendelenburg procedure, where flush ligation of SFJ done with stripping of vein and subfascial ligation of perforators. Endovenous RFA which is also called venous closure procedure is a catheter based endovascular intervention. Mode of RF energy delivered is in continuous or sinusoidal wave mode. The RFA heat prouction is caused by the resistance of the tissues in the vein walls allowing the passage of current. The electrodes which is selectively insulated results in the preferential delivery of the RF energy to vein wall and minimal heating of the blood within the vessels. RFA done by using Closure plus catheters, wherein delivery of controlled radio frequency to shrink vein wall collagen and induces the collapsible catheter electrodes around which the vein will shrink. There is a central lumen to allow guide wire or for the fluid delivery structures. Thus, the design permits treatment of veins as small as 2mm and as large as 24 mm. The temperature is measured by the thermo couple on the electrode and then provides feedback to the RF generator. The control unit displays the power, temperature, impedence, elapsed time so that precise temperature control is obtained. The technique for performing perforator requires more detailed mapping, because they are not linear like the superficial, but allows the flexibility of repeat treatment for persistent or newly developed varicosities.





Histopathology of varicose veins

Varicose vein sections showed marked intimal hypertrophy due fibrous tissue infiltration, localized thinning of the muscle layer and loss of both the intimal and medial smooth muscle cells (SMCs). Elastic fibers were deficient and scattered with loss of the normal elastin/collagen lattice network and decrease in both the muscle/collagen and elastin/collagen ratios

Observation in RFA

1. There is no incision and surgical dissection of groin
2. Minimal hemodynamic disturbances because of preservation of physiological abdominal wall drainage.

Patients are advised to start normal activity immediately and post op USG done to rule out DVT.

At the end of one week, 60% of veins were hypoechogenic and 40% hyperechogenic. At the

end of six months they become either hyperechogenic or isoechogenic. The sonographic disappearance of saphenous vein in 90% of the limbs at the end of one year.

Improvement In Ceap Class

Group	Parameter	At Presentation	At 3 months
Surgery	Mean Standard deviation	4.30 1.264	3.00 1.819
RFA	Mean Standard deviation	4.23 1.382	2.62 1.781

Using Mann Whitney test, there was no significant difference between improvements seen in both groups (p=0.235).

IMPROVEMENT IN VENOUS SEVERITY SCORE (VSS)

Group	Parameter	At Presentation	At 3 months
Surgery	Mean Standard deviation	5.57 3.730	2.30 2.409
RFA	Mean Standard deviation	5.40 3.379	1.67 1.516

In the surgery group the mean VSS improved from 5.57 to 2.3,in RFA from 5.4 to 1.67 ,which means no significant differences in both the groups (p=0.381).

Symptomatic Improvement

In surgery 25 out of 30 patients ie 92.7% had symptomatic improvement compared to 28 out of 30 ie 98.3% in RFA.

Complications

Complications like wound infection, bruising, phlebitis, skin necrosis in both groups were minor.

Analgesic Requirements

In surgery all patients required oral analgesics, in addition 60% required injectable analgesic. In RFA only 20% required any analgesic.

Time to return to work

SURGERY: Average 10 days

RFA: average 4 days

Number of days hospitalized

In surgery: average 7 days

In RFA: average 3 days

Evidence of post op DVT

Nil in both categories

RECURRENCE AT 3 MONTHS

NIL in both categories.

Discussion

The idea behind both procedures are to remove the incompetent veins from the venous circulation to reduce the venous hypertension, with subsequent result in the resolution of symptoms without significant morbidity. Postoperative pain reduction is markedly less RFA than in surgery. Medical leave was also shorter in the RFA group. The restoration of physical activity is faster in RFA group than in surgery.

Venous severity score and improvement in CEAP score were nearly similar for both groups. Recurrence were not seen in both groups. The time required for surgery and RFA were almost the same.

Within 2 weeks, that is early follow up is focused on procedure related complications patients' recuperations, quality of life after surgery and procedure impact on the hemodynamic and clinical outcomes. No significant differences were observed between the groups in the patient demographics.

The examination with Duplex ultrasound revealed 91.7% free of reflux in RFA and 89.7% free of reflux in the veins stripping surgery. Both RFA and venous stripping methods were successful, and the complications were nearly similar between the groups

The most important different seen was on patient recovery. The mean time required for patient to return to normal activities was 1.5 days for RFA compared to about 5 days in surgery.

Conclusion

The favored alternative in the treatment of superficial and perforator venous reflux disease in the newer era is the endovenous RFA. The RFA outperforms not only regard to morbidity and outcome but also reduces the formation of neovascularization that is frequently blamed reason for the higher recurrence rates seen with the vein stripping.

Obliteration of superficial venous system in short term is similar in surgery and RFA. Clinical improvement as measured by CEAP class and venous severity score are similar in both the groups. Complications in both the groups are minor and relatively less frequent. RFA is less morbid than surgery. Patient undergoing RFA return to work earlier and postoperative pain is significantly less in surgery than in RFA.

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