Endovenous radiofrequency ablation for the treatment of varicose veins

Ahmed Kayssi, MD, MSc, MPH
Marc Pope MD, MSc
Ivica Vucemilo, MD
Christiane Werneck, MD, MScCH

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Correspondence to:
C. Werneck
Division of Vascular Surgery
University of Toronto
89 Queensway West, Suite 500
Mississauga ON L5B 2V2
christiane.werneck@utoronto.ca

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Summary

Varicose veins are a common condition that can be treated surgically. Available operative modalities include saphenous venous ligation and stripping, phlebectomy, endovenous laser therapy and radiofrequency ablation. Radiofrequency ablation is the newest of these technologies, and to our knowledge our group was the first to use it in Canada. Our experience suggests that it is a safe and effective treatment for varicose veins, with high levels of patient satisfaction reported at short-term follow-up. More studies are needed to assess long-term effectiveness and compare the various available treatment options for varicose veins.

Varicose veins affect approximately 26% of the adult population and are a frequent cause of discomfort, loss of productivity and deterioration in health-related quality of life.[1] Numerous therapies have been developed for the treatment of this condition. Conventional open surgical interventions include ligation of the great saphenous vein at the saphenofemoral junction and stripping. Smaller veins have also been treated with phlebectomies. More recently, less invasive modalities, such as foam sclerotherapy, endovenous laser therapy (EVLT) and endovenous radiofrequency ablation (RFA), have also been used. While endovenous approaches are associated with fewer postoperative complications, such as hematoma, pain or saphenous nerve injury, there is currently no strong evidence to suggest an overall advantage for any particular treatment approach.[2]

The RFA procedure involves using a catheter electrode to deliver a high-frequency alternating radiofrequency current that leads to venous spasm, collagen shrinkage and physical contraction.[3] The patient's leg is prepped with antiseptic solution and draped in a sterile fashion. With ultrasound guidance, the vein is cannulated, and local tumescent anesthetic is then injected around the target venous segment. The catheter is then introduced through a sheath. The radiofrequency current is then delivered, resulting in circular homogeneous denaturation of the venous collagen matrix and endothelial destruction at a temperature of 110–120° C. Venous segments 3–7cm in length are treated in 20-second cycles. Patients are instructed to wear 20–30 mm Hg graduated elastic compression stockings for at least 14 days.

Compared with conventional open surgery, RFA can be performed in the outpatient setting without the requirement for hospital admission or general anesthesia. However, the procedure is not feasible in tortuous or very small or large veins, and it may be less cost-effective than open surgery because of the cost of the catheters.

To our knowledge, our institution was the first in Canada to offer RFA for the management of varicose veins using the venefit procedure with second-generation ClosureFast catheters (Covidien). Between 2010 and 2013, 173 patients underwent RFA performed by 3 vascular surgeons. The average age of the patients was 52 ± 14 years, and 143 (83%) of the patients were women. Our patients were referred to the clinic either by their family doctors

or another vein clinic, and they underwent preoperative Doppler ultrasonography to identify reflux within the target vein. The decision to offer a patient RFA was based on the target vein anatomy and diameter. The maximum vein diameter considered for the procedure was 1.8 cm, and the minimum was 0.4 cm. Elderly patients also underwent arterial duplex scans to rule out arterial insufficiency.

Most (72%) patients underwent treatment of a single limb, and 89% of patients underwent treatment of a single vein. The great saphenous vein was most frequently treated (81%), followed by the small saphenous (7%) and the accessory great saphenous (1%).

Postoperatively, the median time that patients took off work was 2 days. While 80 (69%) patients needed no postoperative analgesia, 35 (30%) patients used over the counter oral analgesics, such as acetaminophen or ibuprofen. Only 1 patient needed an opioid analgesic. Duplex ultrasonography performed 2–4 weeks after the procedure demonstrated successful vein occlusion in 99% of patients. Only 1 patient showed evidence of partial recanalization on follow-up. Two (1%) patients reported persistent pain at 30-day follow-up, and 6 (4%) patients demonstrated skin discoloration. Eight (5%) patients with residual large veins returned to our clinic after the follow-up period and underwent phlebectomy procedures.

Telephone interviews were conducted several weeks after the procedure to assess patient satisfaction. Of the 111 (65%) patients contacted, 83% were extremely satisfied, 12% were very satisfied, 3% were somewhat satisfied, and 2% were not too satisfied with their RFA experiences. However, all of those who responded indicated that they would have this procedure again and would recommend it to a friend.

Our experience suggests that RFA is a safe and effective treatment for the management of varicose veins that is associated with a high success rate and patient satisfaction. Only 1 patient in our series demonstrated target-vein recanalization on follow-up. This was a cirrhotic patient with a history of hepatic failure who was on chronic anticoagulation therapy for multiple medical comorbidities. Her vein was also 1.5 cm in diameter, which was close to the cutoff of 1.8 cm that we accept in our practice.

To our knowledge, our group is the first to describe the successful implementation of RFA in Canada, where public health insurance guidelines have greatly restricted the criteria for reimbursing venous procedures and where many vein surgeries are performed at private clinics. In the face of this changing reimbursement landscape, we believe that RFA is a viable alternative to more conventional open vein surgeries and EVLT, which are more widely available in Canada.

Our work as well as studies by other groups will hopefully continue to enrich the debate on the most suitable intervention for the management of venous disease. A 2011 review by Ontario's Medical Advisory Secretariat found that RFA was superior to open vein surgery when comparing postoperative pain, duration of recovery, major adverse effects and patient preference, while open surgery was less costly than RFA.[4] However, the same review found no evidence to suggest major differences in postoperative pain between RFA and EVLT when pain was adjusted for analgesic use, and any differences did not persist after 1-month follow-up. Furthermore, the 2 procedures did not differ when comparing treatment effectiveness or durability. This was mostly because of a lack of studies that have assessed long-term recurrence after either treatment. Prospective, long-term studies are thus clearly needed to compare the clinical and cost-effectiveness of both treatments and provide health care consumers with the best standard of care.

Affiliations: All authors are from the Division of Vascular Surgery, Trillium Health Partners, University of Toronto, Mississauga, Ont.

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