

Percutaneous Ultrasound-Guided Radiofrequency Ablation (VNUS) Can be Used to Treat Perforator Incompetence: 1-Year Results and How to Do It

NOTES

David W. Chang, MD, RVT, San José, CA; D. Levy, RVT; R.M. Hayashi, MD, RVT; R.W. Starrett, MD, RVT; D. Smith, MD, RVT

Background

Reflux in a lower-leg perforator vein (PV) can contribute to signs and symptoms associated with chronic venous disease. Treatment of PVs includes open ligation and division, subfascial endoscopic perforator vein surgery, and sclerotherapy. We evaluated the effectiveness, safety, and ease of use of three configurations of a temperature-controlled radiofrequency device having fixed-diameter bipolar electrodes.

Materials and Methods

Incompetent lower-leg PVs in symptomatic patients were treated using a device containing either two rounded electrodes on a rigid shaft (DBR), one rounded electrode and a sharp-tip electrode on a rigid shaft (SBR), or two rounded electrodes at the end of a flexible shaft (DBF). Using ultrasound guidance (6 to 15 MHz probe), devices were introduced percutaneously through a 12-gauge intravenous catheter. Energy delivery was intra- or extravascular at, or just above or below, the level of the fascia. Treatment parameters varied with device configuration and cumulative experience. During the operative session, patients underwent only perforator treatment or also received great saphenous vein obliteration and/or visible varicose vein phlebectomy. Follow-up examinations were planned for 3 days, 3 weeks, and 6 months.

Results

A 94.1% acute success rate was achieved on 51 perforators in 30 limbs, with DBR, SBR and DBF devices used on 34, 4, and 13 PVs, respectively. The sole notable complication was dysesthesia—numbness or tingling at or near the access location (6.7%). One asymptomatic nonocclusive soleal vein thrombosis occurred, not noted at the 3-day examination but observed at the 3-week follow-up visit, subsequent to the patient taking an intercontinental airline flight. No infections, hematoma, AV fistula, or pulmonary embolism occurred. At 6 months, the absence of reflux was noted in 83.3% (25 of 30) of treated PV segments. Average venous clinical severity score was 1.1 ± 1.1 compared with 8.3 ± 3.7 prior to intervention ($p < .001$).

Conclusions

In this study, the DBR configuration was found easiest to use, followed by the flexible design in certain applications. The correlation of outcomes with device configurations was not possible given the sample size of the study owing to the high success rate, low rate of complications, and variations in treatment parameters. Optimization of the treatment algorithm is under way.