

Chronic Superficial Venous Insufficiency—Its Prevalence and Effects of Endovenous Ablation Treatment on Diabetic Foot Neuropathy

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PURPOSE:

Chronic venous insufficiency affects 5-7% of the general population in the United States. In patients with diabetic foot neuropathy (DFN), however, it represents a significant co-morbidity and compounding factor that further increases the symptoms of DFN.

Based on retrospective analysis of patients evaluated for DFN over the past two years, our experience has shown that a great majority of DFN patients suffer from chronic venous insufficiency, with communicating incompetent perforators refluxing into the tibial veins.

MATERIALS AND METHODS:

A two year retrospective analysis of symptomatic DFN patients yielded 45 patients (M=21, age 35-74; F=24, age 36-78; N=90). Their symptoms were catalogued pain levels were graded on the visual analogue scale (VAS). As part of ultrasound evaluation of the tarsal tunnel and tibial nerve measurements, venous duplex evaluation was performed, initially evaluating the tibial veins with graded compression and augmentation techniques, measuring the post-augmentation recovery time (PART). PART > 50 msec resulted in full lower extremity venous duplex analysis from the SFJ to the ankle, cataloguing the PART of the superficial saphenous system, including the perforators. Patients were then placed in 4 combinations of vein and nerve abnormalities: V(-)/N(-), V(+)/N(-), V(-)/N(+), V(+)/N(+), where V(+) indicates significant reflux and N(+) indicates significant tibial nerve compression. Patients with CEAP classification of 4a and above were treated with endovenous ablations (RF and Laser) followed by tabulation of change in their symptoms.

RESULTS:

The distribution of patients in the four quadrants is as follows: V(-)/N(-)=2%, V(+)/N(-)=14%, V(-)/N(+)=11%, V(+)/N(+)=73%. Over 87% of DFN patients had associated venous reflux disease in the saphenous system, regardless of the abnormalities of the tibial nerve. 84% of DFN patients had compression of the tibial nerve.

After endovenous ablation treatments of the superficial venous reflux including the perforator vein, 58% of patients had reduction of VAS scale > 4 points, 22% had drop of >5 points, 7% had drop > 6 points, and 1% had drop of >7 points. 12% of patients had VAS drop <4 points.

CONCLUSION:

Chronic venous insufficiency is a significant but often silent disease associated with DFN, with prevalence far above that of the non-diabetic population. Presence of venous reflux into the tibial veins result in increased hydrostatic pressure on the already abnormal tibial nerves, resulting in increased morbidity. Treatment of chronic venous insufficiency significantly improved the symptoms associated with DFN.