CONTROVERSES ET ACTUALITÉS EN CHIRURGIE VASCULAIRE
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Is it safe to treat varicose veins by thermal ablation below the knee?

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Disclosure

Speaker name: Peter Gloviczki , MD

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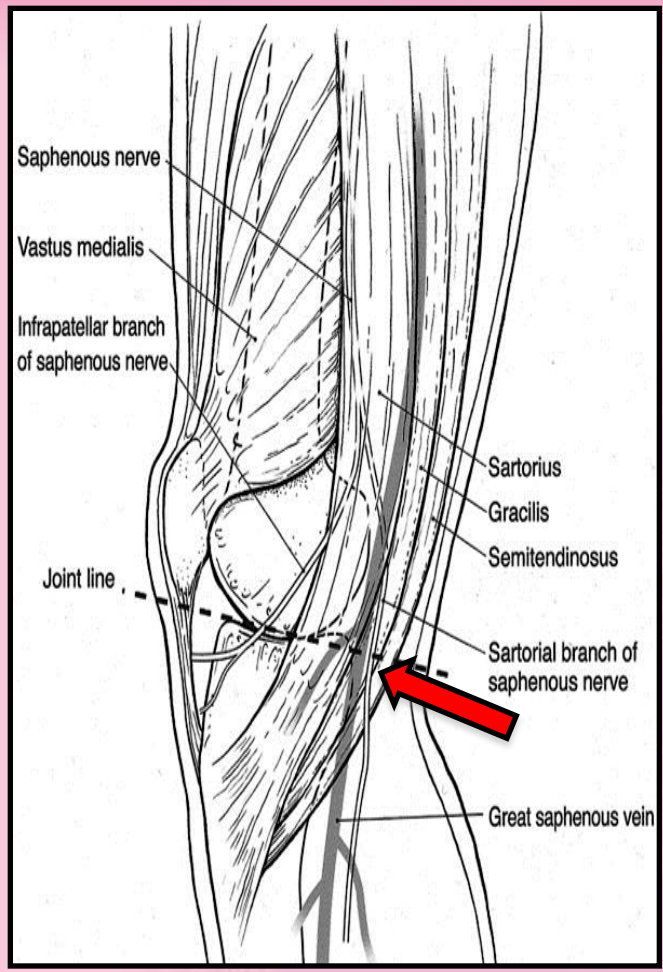
- ☐ I have the following potential conflicts of interest to report:
- ☐ Consulting
- ☐ Employment in industry
- ☐ Shareholder in a healthcare company
- ☐ Owner of a healthcare company
- ☐ Other(s)

☒ I do not have any potential conflict of interest

Background

- Injuries to the saphenous or sural nerves have been major concerns that limited widespread use of endovenous thermal ablations below the knee (BK)
- Incidence of nerve injuries as high as 39% have been reported with stripping of the BK segment of the Great Saphenous Vein (GSV)
- SVS/AVF practice guidelines for GSV incompetence*:

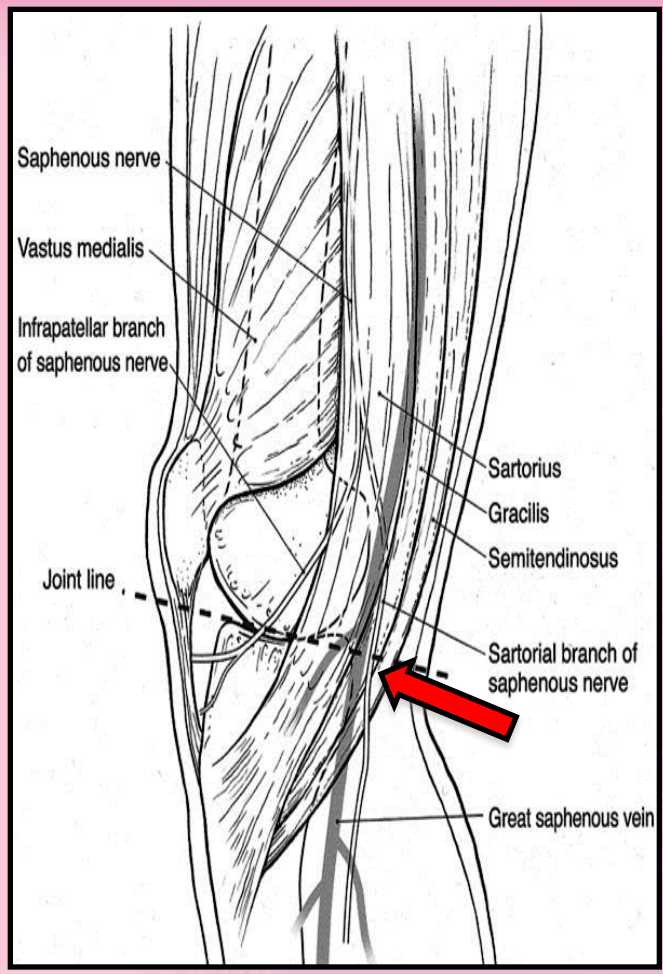
  Stripping/Endovenous ablation of the above knee GSV



* Gloviczki et al. J Vasc Surg 2011;53:2S-48S

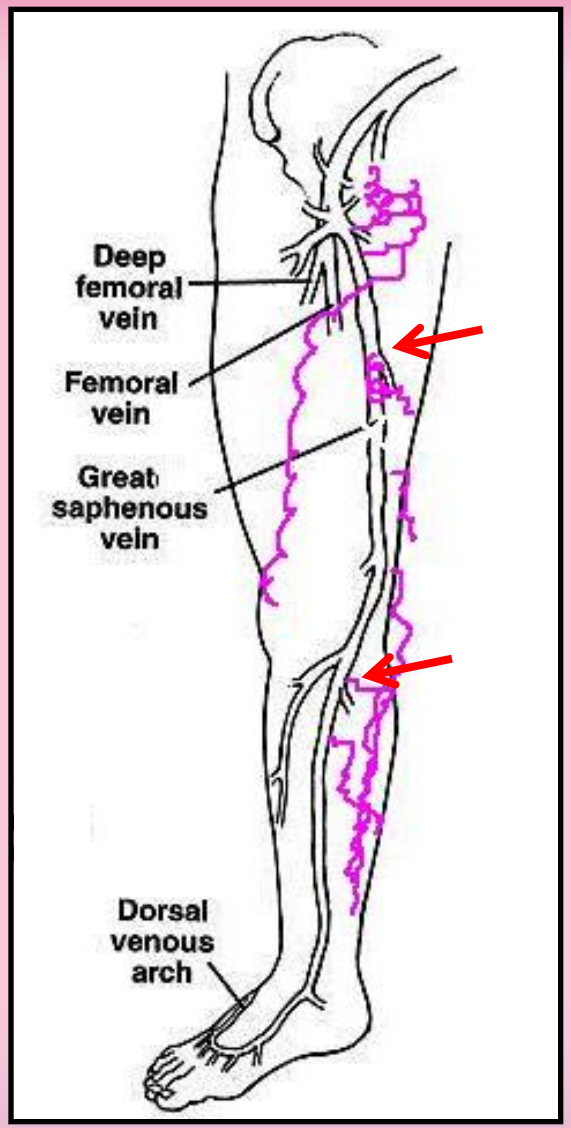
Background

- BK GSV reflux is reported in up to 81% of patients; increasing to 91% at 2 years following AK GSV ablation*
- Ignoring the refluxing BK-GSV is reported to result in residual symptoms and need for re-intervention in nearly half of the patients.**



* van Neer et al. J Vasc Surg 2009;50(4):831-4
**Gloviczki et al. J Vasc Surg 2011;53:2S-48S

Patient Presentation



Right CFV= -3
Right FV mid= +
Right PV mid= +
Right PTV= +
Right GSV SFJ= -3
Right GSV prox thigh= -3
Right GSV mid thigh= -3
Right GSV distal thigh= -3
Right GSV knee= -3
Right GSV calf= -3
Right GSV ankle= -2
Right SSV SPJ= +
Right SSV calf= +
Right SSV ankle= X

Competent= +
Absent= A
Not Imaged= X

-1 = 0.5 to 1 second
-2 = 1 to 3 seconds
-3 = > 3 seconds

Reflux in the Below-knee Great Saphenous Vein Can Be Safely Treated with Endovenous Ablation

S. M. Gifford, M. Kalra, P. Gloviczki, J. Friese, H. Bjarnason, A. Duncan, G. Oderich, M. Fleming, T. Bower, Mayo Clinic, Rochester, Minn

Background: Intervention on the great saphenous vein (GSV) has traditionally been limited to the above-knee (AK-GSV) segment for fear of saphenous neuralgia, in spite of incompetence demonstrated in the below-knee (BK-GSV) segment. Ignoring the refluxing BK-GSV is reported to result in residual symptoms and need for re-intervention in nearly half the patients. Experience with endovenous ablation of the BK-GSV at the time of AK-GSV treatment is sparsely reported in the literature. The aim of this study is to evaluate the safety of endovenous ablation of the refluxing BK-GSV.

Methods: Data from consecutive patients treated with superficial venous ablation over a 30-month period from January 2010 until August 2012 were retrospectively reviewed. Demographic and procedure-related outcome and complication data were analyzed specifically for patients undergoing BK-GSV interventions.

Results: A total 387 patients were treated with superficial venous ablation during the study period. Of those, 38 (47 limbs) underwent BK-GSV ablation for reflux at the site. There were 22 females and 16 males (mean age, 51 years). Median CEAP score was 3; 27 limbs were treated for symptomatic varicose veins (C2) and 20 for advanced venous insufficiency (C 4-6). Five (10.6%) limbs were treated for failed intervention with AK-GSV ablation

47 limbs treated with EVLT (n=45) or RF (n=2) to ablate the BK-GSV

No DVT or EHIT, no skin burn, two early recanalization

Neuralgia in 1 patient (2.3%), resolved in 2 weeks

Endovenous Laser Treatment of Incompetent Below-Knee Great Saphenous Veins

Paul E. Timperman, MD

PURPOSE: To test the hypotheses that below-knee great saphenous vein (GSV) reflux after successful ablation of the incompetent above-knee GSV is a cause of incomplete clinical success and that endovenous laser treatment (ELT) of the incompetent below-knee GSV can safely eliminate persistent symptoms.

MATERIALS AND METHODS: The author evaluated 576 consecutive ELT procedures of the GSV. Fifty ELT procedures in incompetent calf GSVs were included in this study. Patients with reflux of the entire GSV were selected. All patients underwent clinical and ultrasonographic (US) follow-up.

RESULTS: In 16 of the 50 procedures, ELT was performed in the GSV both above and below the knee in separate sessions. In 34 procedures, ELT of the GSV above and below the knee was performed at the same session. An 810-nm laser was used at [illegible]. The mean energy was 82 j/cm (range, 56.4–114 j/cm; standard deviation [SD], 14 j/cm). The mean follow-up was 11 mo[illegible]nge, 0–28 months; SD, 7 months). Four paresthesias occurred. Medial ankle pain resolved in all patients, and swel[illegible]lved in all but six limbs. No recanalization occurred.

CONCLUSIONS: Patients wi[illegible]nce of the entire GSV treated with only ELT of the above-knee GSV experienced incomplete relief of [illegible]in and swelling; however, symptomatic relief is obtained safely and effectively with additional ELT of the [illegible]V.

J Vasc Interv Radiol 2007; 18:1495–1499

50 of 576 EVLE below the knee
4 paresthesia, but ankle pain resolved in all
No recanalization

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RESULTS: In 16 of the 50 procedures, ELT was performed in the GSV both above and below the knee in separate sessions. In 34 procedures, ELT of the GSV above and below the knee was performed at the same session. An 810-nm laser was used at 14 W. The mean energy was 82 j/cm (range, 56.4–114 j/cm; standard deviation [SD], 14 j/cm). The mean follow-up was 11 months (range, 0–28 months; SD, 7 months). Four paresthesias occurred. Medial ankle pain resolved in all patients, and swelling resolved in all but six limbs. No recanalization occurred.

CONCLUSIONS: Patients with incompetence of the entire GSV treated with only ELT of the above-knee GSV experienced incomplete r[illegible] of medial ankle pain and swelling; however, symptomatic relief is obtained safely and effectively with additional ELT [illegible] knee GSV.

J Vasc Interv Radiol 2007; 18:1495–1499

Incomplete treatment of the incompetent GSV provides partial relief of symptoms

EVLA below the knee is safe and effective

Endovenous laser ablation: Does standard above-knee great saphenous vein ablation provide optimum results in patients with both above- and below-knee reflux? A randomized controlled trial

Nadarajah S. Theivacumar, MRCS, Demos Dellagrammaticas, MRCS, Andrew I. D. Mavor, ChM, FRCS, and Michael J. Gough, ChM, FRCS, *Leeds, United Kingdom*

Background: Following above-knee (AK) great saphenous vein (GSV) endovenous laser ablation (EVLA) 40% to 50% patients have residual varicosities. This randomized controlled trial (RCT) assesses whether more extensive GSV ablation enhances their resolution and influences symptom improvement.
Method: Sixty-eight limbs (65 patients) with varicosities and above and below-knee GSV reflux were randomized to Group A: AK-EVLA (n = 23); Group B: EVLA mid-calf to groin (n = 23); and Group C: AK-EVLA, concomitant below-knee GSV foam sclerotherapy (n = 22). Primary outcomes were residual varicosities requiring sclerotherapy (6 weeks), improvement in Aberdeen varicose vein severity scores (AVVSS, 12 weeks), patient satisfaction, and complication rates.
Results: EVLA ablated the treated GSV in all limbs. Sclerotherapy requirements were Group A: 14/23 (61%); Group B: 4/23 (17%); and Group C: 8/22 (36%); $\chi^2 = 9.3$ (2 *df*) $P = .01$ with $P_{A\text{-}B} = 0.006$; $P_{B\text{-}C} = 0.19$; $P_{A\text{-}C} = 0.14$. AVVSS scores improved in all groups as follows: A: 14.8 (9.3-22.6) to 6.4 (3.2-9.1), ($P < .001$); B: 15.8 (10.2-24.5) to 2.5 (1.1-3.7), ($P < .001$); and C: 15.1 (9.0-23.1) to 4.1 (2.3-6.8), ($P < .001$) and $P_{A\text{-}B} = 0.011$, $P_{A\text{-}C} = 0.042$. Patient satisfaction was highest in Group B. BK-EVLA was not associated with saphenous nerve injury.
Conclusions: Extended EVLA is safe, increases spontaneous resolution of varicosities, and has a greater impact on symptom reduction. Similar benefits occurred after concomitant BK-GSV foam sclerotherapy. (J Vasc Surg 2008;48:173-8.)

EVLA below the knee is safe, has better clinical results and increases resolution of varicose veins

EVLA was performed proximal to mid calf, saphenous nerve injury was not noted

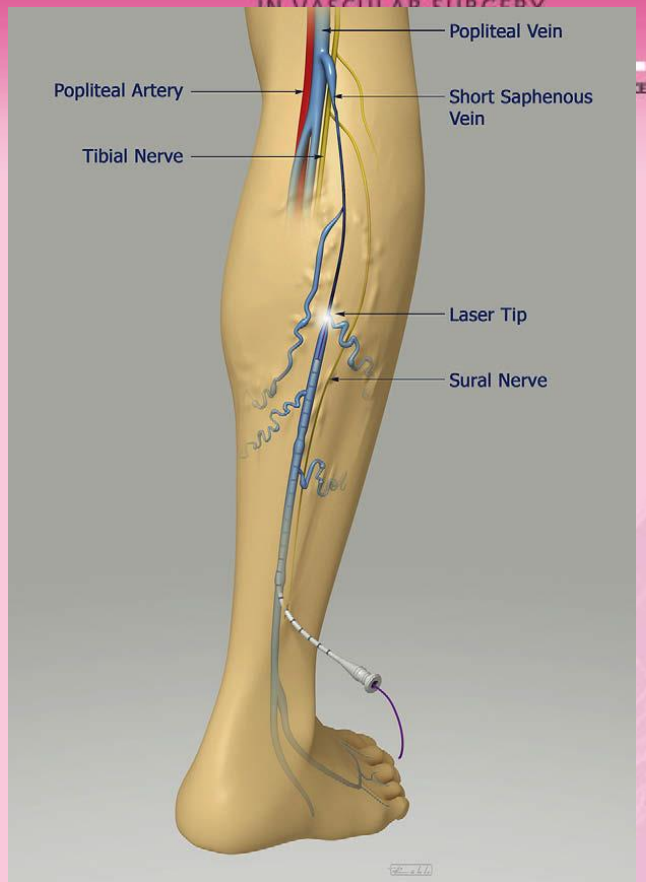
Eur J Vasc Endovasc Surg (2009) 38, 199–202

ELSEVIER

Endovenous Laser Ablation of the Small Saphenous Vein: Prospective Analysis of 150 Patients, a Cohort Study

L.C. Huisman, R.M.G. Bruins, M. van den Berg, R.J. Hissink*

Abstract *Objective:* To evaluate treatment of the small saphenous vein (SSV) by endovenous laser ablation.
Study design: A cohort study, occlusion of the vein and safety of the procedure was analysed prospectively.
Patients: 150 consecutive patients (169 limbs) were treated between August 2006 and January 2008 in an outpatient clinic setting. The average age was 57 years (range 23–87); 82% female; 31% had serious varicose disease (CEAP 3–6). Treated length averaged 23 cm (range 6–53 cm).
Methods: All patients underwent a standardised assessment comprising digital questionnaire, physical examination and duplex ultrasonography. The SSV was cannulated percutaneously under ultrasound control and perivascular local anaesthesia (tumescent) was injected. An 810 nm diode laser was used, delivering 70 J/cm. Three months post-treatment all patients received a duplex ultrasound of the treated
Results: Complete occlusion of the SSV af
patients (1.3%) ha
bitis. Serious complicati
Conclusions: Endovenous lase
a safe, effective and technically fe



- **150 patients with SSV EVLT (810 nm diode laser)**
- **Mean length treated :23 cm (6-53)**
- **Complete SSV occlusion 98% at 3 mo.**
- **1.3% had sural nerve paresthesia**
- **6 superficial thrombophlebitis**
- **No serious complications**

Eur J Vasc Endovasc Surg (2011) 41, 400–405

ELSEVIER

esvs Journal

Does Puncture Site Affect the Rate of Nerve Injuries Following Endovenous Laser Ablation of the Small Saphenous Veins?

S. Doganci [a,*], V. Yildirim [b], emirkilic [a]

[a] Gulhane Military Academy of Medicine, Depart scular Surgery, Turkey
[b] Gulhane Military Academy of Medicine, Departi logy, Turkey

Yes!

Puncturing the vein at midcalf and not at the ankle resulted in less sural nerve injuries, without an effect on recanalization rate

Results of Endovenous Laser and RF * Ablations of the Small Saphenous Vein ‘

1st Author	Year	Limbs N with FU (N)	Technical success (%)	Follow-up (month)	Occlusion (%)	Sural nerve injury (%)	DVT (%)
Proebstle	2003	37 (41)	95	6	100	11	3
Ravi	2006	37 (101)	--	36	84	--	0
Theivacumar	2006	46 (68)	100	6	88	4.4	0
Gibson	2007	126 (210)	100	4	96	1.6	5.7
Park	2008	96	100	12	96@1 m	--	--
Huisman	2009	150 (169)	--	3	98	1.3	0
Kontothanassis	2009	229	100	6	98.7@≤2 m,	2.2	1.3
Jane d’Othee	2010	65 (67)	100	20	98.5@3m	0	0
Doganci	2011	60	100	6	100	12	0
Samuel	2012	58	100	12	93	12	0
Harlander-Locke*	2013	80	98.7	6.2	100	--	0

Conclusions

- Endovenous thermal ablation below the knee can be performed safely, with a low rate of minor complications

- Neuralgia cannot be completely excluded

Conclusions

- Puncturing at mid-calf level and using large amount of tumescent anesthesia will result in less chance of saphenous or sural nerve injury.
- Further studies are needed to investigate the benefit of routine duplex scanning of the sural or saphenous nerves and determine what type of anesthesia can or cannot be used for these patients.

THANK YOU !
MERCI!