

**Table XIV. Classic open surgery versus EVLA versus UGFS.  
8 articles. 3 RCTs**

*Reference underlined in same color means same RCT*

Operative procedure	Reference	Summary
<p>OS versus EVLA versus UGFS</p>	<p><u>Biemans AAM, Kockaert M, Akkersdijk GP, van den Bos RR, de Maeseneer MGR, 240 Cuypers P et al. Comparing endovenous laser ablation, foam sclerotherapy, and conventional surgery for great saphenous varicose veins. <i>J Vasc Surg.</i> 2013;58:727-34.</u></p>	<p>Multicenter study 240 consecutive patients in CEAP C<sub>2-6</sub> s with incompetent GSV and SFJ reflux In this study, only the GSV in the thigh (from just below or above knee level in most cases) was treated Group I (n=80): OS under general or spinal anesthesia versus Group II (n=80): EVLA 940 nm, bare fiber, continuous laser withdrawal under local anesthesia versus Group III (n=80): UGFS with complementary session after 3 months when needed <b>Results at 1 year of follow-up:</b> · Lower occlusion rate in group III (72.7%) compared with this in group I (88.22%) and group II (88.5%). P&lt;0.02 · Low complication rate, comparable between the groups. All groups showed significant improvement in HRQoL,(EQ5D) with no difference between the groups.</p>

	<p>Brittenden C, Cotton SC, Elders A, Ramsay CR, Norrie J, Burr J et al. A Randomized Trial Comparing Treatments for Varicose Veins. <i>New Engl J Med.</i> 2014.371(13):1218-27</p>	<p>Multicenter study  798 patients with primary varicose veins with GSV reflux+/- SSV reflux+/-deep venous reflux  CEAP clinical class C2-C6  Group I (n=210): EVLA under local anesthesia. Saphenous truncal ablation completed after 6 weeks by UGFS if needed.  <i>versus</i>  Group II (n=286): UGFS using the Tessari method with STS 1-3%; ratio air/ sclerosing agent 3/1; 12 ml maximum/session  <i>versus</i>  Group III (n=289): OS consisting of HL+GSV stripping+ tributary phlebectomy under general anesthesia  <b>Results at 6 weeks to 6 months of follow-up:</b>  · Lower <i>complication rate</i> lower in group II compared to groups I and III (P&lt;0.001)  · <i>HRQoL scores:</i> (AVVQ, EQ-5D™, SF-36): similar scores after treatment in all groups (no significantly worse in group II when using the disease-specific AVVQ)  · <i>VCSS scores:</i> similar clinical results in the 3 groups  · <i>Anatomical outcome</i> on DS assessment: lower ablation rate in group II compared to groups I and III. P&lt;0.001.</p>
	<p>Tassie E, Scotland G, Brittenden J, Cotton SC, Cambell MK, Gough M et al. Cost- effectiveness of ultrasound-guided foam sclerotherapy, endovenous laser ablation or surgery as treatment for primary varicose veins</p>	<p>Multicenter study  798 patients with primary varicose veins with GSV reflux+/- SSV reflux+/-deep venous reflux  CEAP clinical class C2-C6  Group I (n=210): EVLA under local anesthesia. Saphenous truncal ablation completed after 6 weeks by USGFS if needed.</p>

	<p>from the randomized CLASS trial. <i>Br J Surg.</i> 2014;101:1532-40.</p>	<p><i>versus</i>  Group II (n=286): UGFS using the Tessari method with STS 1-3%; ratio air/ sclerosing agent 3/1; 12 ml maximum/session  <i>versus</i>  Group III (n=289): OS consisting of HL+GSV stripping+ tributary phlebectomy under general anesthesia  <b>Results at 6 months of follow-up:</b>  <i>Costs:</i> group III &gt; group I &gt; group II  The results suggest, for patients considered eligible for all three treatment options, that EVLA has the highest probability of being cost-effective at accepted thresholds of willingness to pay per QALY</p>
	<p>van der Velden SK, Biemans AA, De Maeseneer MG, Kockaert MA, Cuypers PW, Hollestein LM et al. Five-year results of a randomized clinical trial of conventional surgery, endovenous laser ablation and ultrasound-guided foam sclerotherapy in patients with great saphenous varicose veins <i>BJS</i> 2015;102:1184-1194</p>	<p>Multicenter study  224 lower limbs patients in CEAP C<sub>2-5</sub> s with incompetent GSV and SFJ reflux  All treatments just below or above the knee  Group I (n=69): OS under general or spinal anesthesia  <i>versus</i>  Group II (n=71): EVLA 940 nm, bare fiber, continuous laser withdrawal under local anesthesia  <i>versus</i>  Group III (n=77): UGFS with complementary session after 3 months when needed  <b>Results at 5- year of follow-up:</b>  . Obliteration or absence of the GSV  Group I =95%, Group II =77%, Group III= 23%  . Absence of above knee reflux  Group I =85%, Group II =82%, Group III= 41%  . All groups had equivalent CIVIQ sores and showed significant improvement in HRQoL (EQ5D) with no difference between the groups</p>

**Reinterventions and additional treatments of the GSV above the knee**

Groups I and II= 10%; Group III= 32%

Brittenden J, Cotton SC, Elders A, Tassie E, Scotland G, Ramsay CR, et al. Clinical effectiveness and cost-effectiveness of foam sclerotherapy, endovenous laser ablation and surgery for varicose veins: results from the Comparison of Laser, Surgery and foam Sclerotherapy (CLASS) randomised controlled trial. Health Technol Assess 2015;19 (27).

Multicenter study

Analysis of a 3-arm RCT (foam, EVLA and surgery) in treatment of SSV

17 patients with isolated SSV insufficiency

29 patients with combined GSV and SSV insufficiency (only outcome of SSV is assessed)

**Procedural complication**

The event rate for any procedural complication was lower for EVLA (1%) than for either foam (7%) or surgery (8%). P < 0.001.

**Recovery**

Foam and EVLA better than surgery

**Outcome at 6 months**

**Isolated SSV insufficiency**

	<b>EVLA 9 patients n; %</b>	<b>Foam 11 patients n; %</b>	<b>Surgery 11 patients n; %</b>
Complete success	6/9; 66.7%	4/11; 36.4%	3/11; 27.3%
Partial success	3/9; 33.3%	2/11; 18.2%	3/11; 27.3%
Failure	0/9; 0%	5/11; 45.5%	5/11; 45.5%

**Combined SSV insufficiency**

	<b>EVLA 7 patients n; %</b>	<b>Foam 13 patients n; %</b>	<b>Surgery 9 patients n; %</b>
Complete success	5/7; 71.4%	4/13; 30.8%	3/9; 33.3%
Partial success	2/7; 28.6%	5/13; 38.5%	4/9; 44.4%
Failure	0/7; 0%	4/13; 30.8%	2/9; 22.2%

		Complete success	2/7; 28.6%	2/13; 15.4%	1/9; 11.1%
		Partial success	2/7; 28.6%	1/13 7.7%	0/9; 0%
		Failure	3/7; 42.9%	10/13; 76.9%	8/9; 88.9%
	<p>Venermo M, Saarinen J, Eskelinen E, Vähäho S, Saarinen E, Railo M et al. Randomized clinical trial comparing surgery, endovenous laser ablation and ultrasound-guided foam sclerotherapy for the treatment of great saphenous varicose veins. BJS 2016;103:1438-1444</p>	<p>Multicenter study  214 patients in CEAP C<sub>2-4</sub>s with incompetent GSV  All treatments just below or above the knee  Group I (n=65): OS including tributary phlebectomy under general anesthesia completed by local tumescent anesthesia  <i>versus</i>  Group II (n=73): EVLA 980 nm, bare fiber, then 1470-Nm radial fiber; pulsed mode, 12 W energy completed by tributary phlebectomy under local tumescent anesthesia  <i>versus</i>  Group III (n=76): UGFS Polidocanol 1% or STS &amp; and 3% with complementary session after 1 month, then 2 months when needed.  <b>Post-operative outcome up to 1-month</b>  - <i>Postoperative pain measured with VAS</i>  Lesser in group III  - <i>Sick leave</i>  Shorter in group III. P&lt;0.001  - <i>Hematoma</i>  Lesser in group III compared to groups I and II. P=0.001  - <i>Skin Pigmentation</i>  More common in group III compared to group I and II. P&lt;0.001</p>			

		<p><b>Outcome at 1 year</b> - <i>Saphenous occlusion</i></p>
	<p>Vähäaho. S, Halmeski K, Albäck A, Saarinen F, Venermo M. Five-year follow-up of a randomized clinical trial comparing open surgery, foam sclerotherapy and endovenous laser ablation for great saphenous varicose veins. BJS 2018;105:686-691</p>	<p>Multicenter study 196 patients in CEAP C<sub>2-4</sub>s with incompetent GSV All treatments just below or above the knee Group I (n=65): OS including tributary phlebectomy under general anesthesia completed by local tumescent anesthesia <i>versus</i> Group II (n=73): EVLA 980 nm, bare fiber, then 1470-Nm radial fiber; pulsed mode, 12 W energy completed by tributary phlebectomy under local tumescent anesthesia <i>versus</i> Group III (n=76): USGFS Polidocanol 1% or STS &amp; and 3% with complementary session after 1 month, then 2 months when needed. <b>Outcome at 5 years</b>, 166 patients available for follow-up. Group I=50, Group II =57, Group III= 59 <i>GSV absent or occluded</i> Group I = 48 patients Group II = 51 patients Group III 30 patients The difference between the USGFS group and the EVLA or surgery group was statistically significant. P &lt;0.001</p>

		The mean AVVSS was slightly higher after UGFS, but the differences between the treatment groups were not statistically significant (P =0.636).
	Brittenden J, Cooper D, Dimitrova M. five-year outcomes of randomized trial for varicose veins. N Engl J Med 2019;381 :912-922	<p>Multicenter study  798 patients with primary varicose veins with GSV reflux+/- SSV reflux+/-deep venous reflux  CEAP clinical class C2-C6  Group I (n=210): EVLA under local anesthesia. Saphenous truncal ablation completed after 6 weeks by UGFS if needed.</p> <p><i>versus</i></p> <p>Group II (n=286): UGFS using the Tessari method with STS 1-3%; ratio air/ sclerosing agent 3/1; 12 ml maximum/session</p> <p><i>versus</i></p> <p>Group III (n=289): OS consisting of HL+GSV stripping+ tributary phlebectomy under general anesthesia</p> <p><b>Results at 5 -year</b>  595 patients completed the questionnaire  -Disease specific quality of life was better in group I and III  -QALY favored group I</p>

**Abbreviations:** AVQQ = Aberdeen varicose vein questionnaire ; AVVSS= Aberdeen varicose vein severity score; DS = duplex ultrasound; EQ5D= Euro Qol 5D; EVLA = endovenous laser ablation; GSV= great saphenous vein; HRQoL= Health related quality of life; OS= Open Surgery: saphenofemoral ligation+ stripping, +/- perforator ligation+/- tributary phlebectomy; QALY= Quality Adjusted Life Year UGFS= ultrasound guided foam sclerotherapy; VCSS= venous clinical severity score