

**Table XII.**

<p><b>Operative procedure</b></p>	<p><b>Reference</b> <i>Abstracts corresponding to references can be found using the listing "RCTs by alphabetical order" or "RCTs by topic."</i></p>	<p><b>Summary</b></p>
<p>Liquid chemical ablation <i>versus</i> Open Surgery</p>	<p>Einarsson E, Eklöf B, Neglén P. Sclerotherapy or surgery as treatment for varicose veins: A prospective randomized study. <i>Phlebology</i>. 1993;8:22-26.</p>	<p>164 patients with symptomatic primary VV located in GSV or/and SSV Group I (N=80): OS Group II (N=84): Liquid sclerotherapy <b>Post-operative results:</b></p> <ul style="list-style-type: none"> <li>· <i>Loss of working days:</i> 1 day in group II vs 20 days in group I</li> </ul> <p><b>Results at 5 years of follow-up:</b></p> <ul style="list-style-type: none"> <li>· <i>Rate of clinical failure:</i> 10% in group I <i>versus</i> 74% in group II</li> <li>· <i>Foot volumetry measurement:</i> in favor of group I; P&lt; 0.01</li> </ul>
<p>Liquid chemical ablation + HL <i>versus</i> Open Surgery</p>	<p>Rutgers PH, Kitslaar PJEHM. Randomized trial of stripping <i>versus</i> high ligation combined with sclerotherapy in the treatment of the incompetent greater saphenous vein. <i>Am J Surg</i>. 1994;168:311-5.</p>	<p>156 patients and 181 lower limbs with primary GSV incompetence Group I (N=78; 89 lower limbs): OS under general anesthesia Group II (N=78; 92 lower limbs): HL+ Liquid sclerotherapy <b>Results at 3 years of follow-up:</b></p> <ul style="list-style-type: none"> <li>· <i>Clinical results:</i> in favor of group I (P&lt;0.05)</li> <li>· <i>Doppler results:</i> in favor of group I (P&lt;0.001)</li> </ul>
<p>Liquid chemical ablation <i>versus</i> Open Surgery+ liquid chemical ablation <i>versus</i> Open Surgery</p>	<p>Belcaro G, Nicolaidis AN,, Ricci A, Dugall M, Errichi BM, Vasdekis S et al. Endovascular sclerotherapy, surgery and surgery plus sclerotherapy in superficial venous incompetence. A randomized, 10-year follow- up trial-Final results. <i>Angiology</i> 2000 ;31 :529-34</p>	<p>150 patients with primary GSV incompetence Group I: liquid sclerotherapy (polidocanol 3%; 5-10 ml) + complementary session at 3 months if needed Group II: HL + phlebectomy (?) + liquid sclerotherapy under spinal or general anesthesia Group III: HL + phlebectomy (?) <b>Results at 1,5 and 10 years of follow-up:</b></p> <ul style="list-style-type: none"> <li>· <i>Reflux at SFJ:</i> 18.8% in group I vs none in groups II and III</li> <li>· <i>Below the knee reflux:</i> 43.8% in group I <i>versus</i> 16.1% in group II and 36% in group III No conclusion can be drawn from this study</li> </ul>
<p>Liquid and foam chemical ablation <i>versus</i> various open surgery procedures</p>	<p>Belcaro G, Cesarone NM, Di Renzo A, Bandolini R, Coen L, Acerbi G et al. Foam sclerotherapy, surgery, sclerotherapy and combined treatment for varicose veins. A 10-year, prospective, randomised, controlled trial (VEDICO trial). <i>Angiology</i>. 2003;54:307-15.</p>	<p>749 patients with primary GSV incompetence Six groups: Group A (N=123): liquid sclerotherapy Group B (N=112): high dose of liquid sclerotherapy Group C (N=132): multiple ligations Group D (N=122): stab avulsion Group E (N=129): foam + tensio active substance Group F (N=131): surgery (ligation) + sclerotherapy <b>Results at 1, 5 and 10 years of follow-up:</b> all treatments were similarly effective at 10 years. Low-dose sclerotherapy appeared to be less effective than high-dose sclero and foam-sclerotherapy which may obtain, in selected subjects, results comparable to surgery. It's difficult to draw conclusion from this study.</p>

<p>Phlebectomy versus liquid chemical ablation</p>	<p>De Roos KP, Nieman FHM, Neumann M. Ambulatory phlebectomy versus compression sclerotherapy: results of a randomized controlled trial. <i>Dermatol Surg.</i> 2003;29:221-226.</p>	<p>92 patients and 98 lower limbs classified C2 Ep A5 Pr; competent GSV, incompetent lateral accessory veins Group I (N=49 lower limbs): liquid sclerotherapy + 10 day-compression therapy versus Group II (N=49 lower limbs): ambulatory phlebectomy under local anesthesia + 10 day-compression therapy <b>Results at 2 years of follow-up:</b></p> <ul style="list-style-type: none"> <li>· <i>Complications:</i> more minor complications in group I compared with groups II</li> <li>· <i>Recurrence:</i> 18/48 in group I vs 1/48 in groups II; <math>P &lt; 0.001</math></li> </ul>
<p>Chemical ablation (UGFS) + HL versus Open Surgery (HL + S)</p>	<p>Bountouroglou DG, Azzam M, Pathmarajh M, Young P, Geroulakos G. Ultrasound guided foam sclerotherapy combined with sapheno-femoral ligation compared to surgical treatment of varicose veins: early results of a randomised controlled trial. <i>Eur J Vasc Endovasc Surg.</i> 2006;31:93-100.</p>	<p>Patients with incompetent GSV Group I (N=30): HL+ UGFS versus Group II (N=30): HL+S General anesthesia for all procedures <b>Results at 3 months of follow-up:</b></p> <ul style="list-style-type: none"> <li>· No difference between groups in terms of complication</li> <li>· Less expensive and less loss of working days in group I vs group II; <math>P &lt; 0.0001</math>.</li> <li>· Early recanalization in 13% of patients in group I needing complementary injection that resulted in a short term closure in 87%</li> <li>· Costs lower in group I compared with group II</li> </ul>
	<p>Abela R, Liamis A, Prionidis I, Mathai J, Gorton L, Browne T, Panayotopoulos. Y. Reverse foam sclerotherapy of the great saphenous vein and saphenofemoral ligation compared to standard and invagination stripping: A prospective clinical series. <i>Eur J Vasc endovasc Surg.</i> 2008;36:485-490.</p>	<p>Patients with incompetent GSV Group I (N=30): HL+ reverse foam sclerotherapy versus Group II (N=30): HL + invagination S versus Group III (N=30): HL+ standard S General anesthesia for all procedures <b>Results at 2 weeks of follow-up:</b> Less post-operative complications and better patients' satisfaction in group I compared with groups II and III.</p>
	<p>Liu X, Jia X, Guo W, Xiong J, Zhang H, Liu M, Du X, Zhang MH. Ultrasound-guided sclerotherapy of the great saphenous vein with sapheno-femoral ligation compared to standard stripping. <i>Int Angiol.</i> 2011;30 321-6</p>	<p>Patients with incompetent GSV in C2-C6 Group S (N=30): HL+ S+/- TP versus Group F (N=30): HL + UFGS of which 5 received complementary foam sclerotherapy General anesthesia for all procedures <b>Results at 6 months of follow-up:</b></p> <ul style="list-style-type: none"> <li>· Shorter operation time, earlier return-to work and less analgesics intake in group F compared with group S (<math>P &lt; 0.01</math>)</li> <li>· <i>Obliteration:</i> 80% in group F vs 89.5% in group S; <math>P = NS</math></li> </ul>

	<p>Kalodiki E, Lattimer C R, Azzam M, Shawish E, Bountouroglou D G, Geroulakos G. Long Term Results of a Randomized Controlled Trial on Ultrasound Guided Foam Sclerotherapy Combined with Sapheno-femoral Ligation vs Standard Surgery for Varicose Veins. <i>J Vasc Surg.</i> 2012;55:451-7</p>	<p>Patients with incompetent GSV in C2-C6 Group S (N=39): HL+ S+/- TP of which 25 received complementary foam sclerotherapy <i>versus</i> Group F (N=41): HL + UFGS of which 33 received complementary foam sclerotherapy General anesthesia for all procedures. <b>Results at 3 to 5 years of follow-up:</b></p> <ul style="list-style-type: none"> <li>· VCSS: no difference between groups</li> <li>· VSDS: no difference between groups</li> <li>· HRQoL (with specific AVVQ) better in group S compared with group F; P&lt;0.0005</li> </ul> <p>HRQoL (with generic SF-36): no difference between groups for the physical component</p>
<p>Chemical ablation (UGFS) <i>versus</i> Open Surgery (HL+S)</p>	<p>Figueiredo M, Araujo Q, Barros Jr N, Miranda Jr F. Results of surgical treatment compared with Ultrasound- guided foam sclerotherapy in patients with varicose veins: a prospective randomised trial. <i>Eur J Vasc Endovasc Surg.</i> 2009;38:758-63.</p>	<p>Patients with incompetent GSV, C5, Ep, As, Pr Group I (N=27): Foam sclerotherapy, 1–3 sessions, 10 ml/session <i>versus</i> Group II (N=29): HL+S Surgery under local anesthesia <b>Results at 6 months of follow-up:</b></p> <ul style="list-style-type: none"> <li>· Significant clinical improvement in both groups.</li> <li>· <i>Vein ablation at DS</i>: 78% in group I vs 90% in group II; P=NS related to the small number of included patients.</li> </ul>
	<p>Shadid N, Ceulen R, Nelemans P, et al. Randomized clinical trial of ultrasoundguided foam sclerotherapy <i>versus</i> surgery for the incompetent great saphenous vein. <i>Br J Surg.</i> 2012;99:1062-70.</p>	<p>Patients with incompetent GSV at least 20 cm at the thigh Group I (N=23): UGFS polidocanol 3%;.1ml <i>versus</i> Group II (N=200): HL+S partial GSV stripping+/- tributary phlebectomy under general anesthesia <b>Results at 2 years of follow-up:</b></p> <ul style="list-style-type: none"> <li>· <i>PREVAIT</i> : similar in both groups</li> <li>· <i>Symptoms persistence</i> : 11.3% in group I <i>versus</i> 9% in group II; P=0.407 (NS)</li> <li>· <i>Reflux</i> ( more than 2cm in the length of the treated GSV): 35% in group I <i>versus</i> 21% in group II; P=0.003</li> <li>· <i>Cost</i>: €774 in group I vs €1824 in group II</li> </ul>

<p>Chemical ablation (liquid or UGFS) <i>versus</i> HL or HL+S or phlebectomy</p>	<p>Wright D, Gobin J-P, Bradbury AW, Coleridge- Smith P, Spooelstra H et al. Varisolve® polidocanol microfoam compared with surgery or sclerotherapy in the management of varicose veins in the presence of trunk vein incompetence: European randomized controlled trial. <i>Phlebology</i>. 2006;21:180-90.</p>	<p>Patients with incompetent GSV and SSV in C2s-C6 Surgery : 710 patients randomized to Group I: foam sclerotherapy (Varisolve® polidocanol), Group II: surgery (HL 92%, stripping 88%, phlebectomies 53%); no information on the type of anesthesia Group III: conventional sclerotherapy (92% homemade foam) Endpoint ultrasound determined occlusion of truncal veins and elimination of reflux. <b>Results at 1 year of follow-up:</b></p> <ul style="list-style-type: none"> <li>· Occlusion of truncal veins and elimination of reflux determined by US:</li> <li>· 63% in group I vs 86% in group II; P=0.06</li> <li>· 90% in group I vs 76% in group III; P=0.001</li> <li>· Foam resulted in less pain and earlier return to work than surgery.</li> </ul>
<p>Chemical ablation (UGFS) + HL <i>versus</i> Open Surgery (HL+S+TP)</p>	<p>Yin H, He H, Wang M, Li Z, Hu Z, Yao C et al. Prospective Randomized Study of Ultrasound-Guided Foam Sclerotherapy Combined with Great Saphenous Vein High Ligation in the Treatment of Severe Lower Extremity Varicosis. <i>Ann Vasc Surg</i>. 2017; 39: 256–263. doi.org/10.1016/j.avsg.2016.06.027</p>	<p>117 patients C4-C6 with primary GSV insufficiency Group S (N=90): HL+ S+/- TP+/- SEPS Complementary foam session in 9 patients <i>versus</i> Group F (N=73): HL + UFGS ( 2! .3-35 ml +/-SEPS. Complementary foam session in 6 patients <b>Postoperative course</b> No difference between the 2 groups in terms of complications. Group F. The average operating and recovery times were much shorter P&lt;0.001 and the average hospital cost was lower. P&lt;0.001 <b>Results at 1 year of follow-up:</b> Group S (N=74) Group F (N=65) <i>Occlusion of truncal veins and elimination of reflux determined by US</i> No difference between the 2 groups. <i>Prevait</i> No difference between the 2 groups.</p>

**Abbreviations:**

AVVQ =Aberdeen Varicose Vein Questionnaire; CA=chemical ablation; DS= duplex scan;GSV= great saphenous vein; HL=high ligation; OS=open surgery; HL+s+/- perforator ablation+/- tributary phlebectomy; PREVAIT= presence of varices after operative treatment; S= saphenous stripping;SEPS= subfascial endoscopic perforator surgery); SSV= small saphenous vein; TP= tributary phlebectomy; UFGS= ultrasound foam guided sclerotherapy; VCSS= venous clinical severity score; VSDS=venous segmental disease score; VV= varicose vein