<table>
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<th>Operative procedure</th>
<th>Reference</th>
<th>Summary</th>
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<td>OS versus EVLA for GSV or SSV incompetence</td>
<td>de Medeiros CA, Luccas GC. Comparison of endovenous treatment with an 810 nm laser versus conventional stripping of the great saphenous vein in patients with primary varicose veins. <em>Dermatol Surg.</em> 2005;31:1685-94.</td>
<td>Patients with GSV incompetence Group I (N=20): 980 nm diode laser, bare fiber, stepwise laser withdrawal versus Group II (N=20): open surgery Spinal anesthesia for both procedures Results at 9 months (mean) of follow-up:  - No difference between groups regarding postoperative pain  - Fewer swelling and less bruising in group I (EVLA) compared with group II (P not known)  - Better outcome in group I (EVLA) compared with group II (P not known)</td>
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<td>OS versus EVLA for GSV or SSV incompetence</td>
<td>Vuylstecke M, Van den Busche D, Audenaert EA, Lissens P. Endovenous laser obliteration for the treatment of primary varicose veins. <em>Phlebology.</em> 2006;21:80-87.</td>
<td>Patients with GSV incompetence Group I (N=118): 980-nm diode laser bare fiber, stepwise laser withdrawal versus Group II (N=124): open surgery General anesthesia for both procedures Results at 1, 8 weeks and 9 months of follow-up:  - Less postoperative complications in group I (EVLA) compared with group II  - Sick leave shorter complications in group I (EVLA) compared with group II (P&lt;0.001)  - Total cost lower complications in group I (EVLA) compared with group II</td>
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<tr>
<td>OS versus EVLA for GSV or SSV incompetence</td>
<td>Ying L, Sheng Y, Ling H, Lian Y, Hui Y, Ming W. [A random, comparative study on endovenous laser therapy and saphenous veins stripping for the treatment of great saphenous vein incompetence.] <em>Zhonghua-Yi-Xue-Za-Zhi.</em> 2007;87(43):3043-3046.</td>
<td>Patients with GSV incompetence Group I (N=40): 980-nm diode laser, bare fiber pulse mode versus Group II (N=40): OS General anesthesia for both procedures Results at 1 year of follow-up:  - Less bleeding complications in group I (EVLA) compared with group II (P&lt;0.01)  - Less postoperative pain complications in group I (EVLA) compared with group II (P&lt;0.05)</td>
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- No difference between groups regarding APG results |
| **Patients with GSV incompetence**  
Group I (N=62): Diode 980-nm diode laser, bare fiber, stepwise laser withdrawal  
Group II (N=59): OS  
General anesthesia for both procedures  
**Results at 1, 2 and 6 months of follow-up:**  
- No difference between groups in terms of efficacy and safety  
- Less postoperative pain and bruising in group I (EVLA) compared with group II (P=0.05). |
Group I: EVLA with local tumescent anesthesia, 980-nm diode laser, bare fiber, stepwise laser withdrawal (N= 42), continuous laser withdrawal (N= 29)  
versus  
Group II (N=32): OS with general anesthesia  
**Results at 3 months of follow-up:**  
No difference between groups (EVLA and OS) in terms of reflux abolition and HRQoL (specific questionnaire)  
Group I (EVLA)  
Earlier return to normal activity in group I (EVLA, both laser groups) compared with group II (P=0.005) |
Anesthesia: incomplete information  
Group I (N=47): Diode 810-nm diode laser, bare fiber, stepwise laser withdrawal+ HL  
versus  
Group II (N=48): OS  
**Results at 1, 4 and 16 weeks of follow-up:**  
- Less bruising in group I (EVLA) compared with group II (P= 0.001)  
- Longer period of time until return to work in group I (EVLA) compared with group II (P= 0.054)  
- No difference between groups regarding HRQoL (CIVIQ) |
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<th>Reference</th>
<th>Patients with GSV incompetence</th>
<th>Local tumescent anesthesia for both procedures</th>
<th>Group I (N 62): 980-nm diode laser, bare fiber, continuous laser withdrawal + postoperative sclerotherapy for persistent varices versus</th>
<th>Group II OS (N 68): HL +pin-stripping +tributary stab avulsion</th>
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<td>Pronk P, Gauw SA, Mooij MC, Gaastra MTW, Lawson JA, van Goethem AR, van Vlijmen-van Keulen CJ. Randomised Controlled Trial Comparing Sapheno-Femoral Ligation and Stripping of the Great Saphenous Vein with Endovenous Laser Ablation (980 nm) Using Local Tumescent Anaesthesia: One Year Results. <em>Eur J Vasc Endovasc Surg</em> 2010;40:649-656</td>
<td>Results at 1 -14 days of follow-up:</td>
<td>After 2 weeks more postoperative pain in group II compared to group I (P&lt;0.01)</td>
<td>After 2 weeks more hindrance in mobility and daily activities in group II compared to group I (P&gt;0.01)</td>
<td>Results at 1 year of follow-up: No significant differences between groups in terms of DUS recurrence</td>
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<td>Theivacumar NS, Darwood MJ, Gough MJ. Neovascularization and Recurrence 2 years after treatment for sapheno-femoral and great saphenous reflux: a comparison of surgery and endovenous laser. <em>Eur J Vasc Endovasc Surg</em>. 2009;38:203-207</td>
<td>Results at 2 years of follow-up:</td>
<td>Recurrence rates similar in both groups</td>
<td>Neovascularization less frequent in group I (EVLA) compared with group II (P= 0.001)</td>
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<td>Christenson JT, Gueddi S, Gemayel G, Bounameaux H. Prospective randomized trial comparing endovenous laser ablation and surgery for treatment of primary great saphenous varicose veins with a 2-year follow-up. <em>J Vasc Surg</em>. 2010;52:1234-41.</td>
<td>Results at 12 days of follow-up:</td>
<td>No difference between groups in postoperative pain, use of analgesics and return time to normal activities</td>
<td>More hematoma in group II (OS) compared with group I</td>
<td>More bruising in group I (EVLA) compared with group II</td>
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<td>Results at 1 and 2 years of follow-up:</td>
<td>No difference between groups in terms of symptoms, VCSS or HRQoL</td>
<td>One GSV reopening in group I (EVLA)</td>
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<td>Patients with GSV incompetence</td>
<td>Patients with GSV incompetence + incompetent saphenofemoral junction</td>
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<td>Results at 2 years of follow-up: No significant differences between groups in terms of: - Clinical or DUS recurrence - Clinical severity scores (VCSS;AVQQ) - Quality of Life (SF 36)</td>
<td>Tributaries phlebectomy + perforator ligation in both groups</td>
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<td>Carradice D, Mekako AI, Mazari FAK, Samuel N, Hatfield J, Chetter IC. Randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins. <em>Br J Surg.</em> 2011;98:501-10.</td>
<td>Results at 1 week and 1 year of follow-up: Significant improvement after treatment in both groups regarding VCSS &amp; QUALY gain (P &lt; 0.001) - Less pain in group I (EVLA) compared with group II (P&lt;0.001) - Better HRQoL improvement (SF-36) in 6 out 8 domains in group I (EVLA) compared with group II (P= 0.004) - Shorter return to work in group I (EVLA) compared with group II (P&lt; 0.001)</td>
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<td>Patients with GSV incompetence + incompetent saphenofemoral junction Group I (N=62): 980-nm diode laser, bare fiber, pulse mode versus Group II(N=59): OS Local tumescent anesthesia for both procedures</td>
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<td>Results at 1 week to 1 year of follow-up: Better initial technical results in group I</td>
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Results at 1-year of follow-up:
- Clinical recurrence rate was lower in group I (EVLA) compared with group II (4% vs 20.4%; P< 0.001)
- Clinical recurrence was associated with worse AVVQ scores (P < 0.001)

Results at 2 years of follow-up:
- PREVAIT: Group I, 2%; group II, 23.1 % (P= NS)
- DUS recurrence: reflux at the SFJ:
  Group I, 17.8% (clinically silent in 81%);
  Group II, 1.3% (P<0.001)
- Clinical venous severity scoring (HVSS):
  no difference between groups
- HRQoL (CIVIQ): no difference between groups
- Recovery time, ability to work: no difference between groups

Results at 1 week to 1 year (99 limbs) of follow-up:
- Better initial technical results in group I (EVLA) compared with group II (96.2% vs 71.7%; P<0.001)
- Lower postoperative pain in group I (EVLA) compared with group II (P<0.05)
- Earlier return to work and normal function in group I (EVLA) compared with group II (P<0.001)
- Minor sensory disturbance in group I (P = 0.009)

Results at 1 year of follow-up:
- No difference between groups regarding VCSS and HRQoL improvement

Patients with GSV incompetence in CEAP C2-4EPAPr

Group I (N=69): Diode 980-nm diode laser, bare fiber, stepwise laser withdrawal

versus

Group II (N=68): OS

Local tumescent anesthesia for both procedures

Results at 1, 2 and 6 months, and then 1-5 years of follow-up

**Results at 5 years of follow-up:**

- *GSV persistent reflux at DS examination:* no significant difference between groups (P=0.2145)
- *Clinical recurrence:* no significant difference between groups. (P= 0.7209)
- *Retreatment:* no significant difference between groups (P=0.9876)
- *VCSS improvement:* lasted from month 1 month to year 5 without difference between groups.
- *AVVSS improvement:* significant improvement in both groups from 3 month and onwards (P < 0.0001), with no difference between groups at any time point
- *SF-36 scores:* improved in all domains and similarly in both groups
| Flessenkämper I, Hartmann M, Stenger D, Roll S. Endovenous laser ablation with and without high ligation compared with high ligation and stripping in the treatment of great saphenous varicose veins: initial results of a multicentre randomized controlled trial. *Phlebology*. 2013;28:16-23. | Patients with GSV incompetence + incompetent SFJ in CEAP C<sub>2</sub>−6E<sub>p</sub>A<sub>s</sub>P<sub>r</sub>

**Group I** (N=159): HL+ ST
**Group II** (N=142): EVLA
**Group III** (N=148): EVLA+HL

Diode 980-nm diode laser, bare fiber, continuous mode in groups II and III.

Anesthesia: unknown in group I; local tumescent anesthesia in groups II and III.

**Results at day 1 after operation:**
- *Post-operative pain* was higher in group III compared with groups I and II (P=0.0069)

**Results at 2 months of follow-up:**
- *VCSS scores*: no difference between groups
- *Presence of inguinal reflux in GSV*:
  - Group I=0; Group II = 26.7%; Group III=6.7%
    - Group I versus group II; P<0.0001
    - Group I versus group III; P< 0.0009
    - Group II versus group III; P<0.0001


SSV diameter <10 mm with incompetent SPJ

**Group I** (N=118): EVLA with 810-nm diode laser, bare fiber, continuous laser withdrawal under local anesthesia

**Group II** (N=57): SPJ ligation under general or spinal anesthesia

**Post-operative results:**
- *Easiness of procedure* in favor of group I (EVLA ; P<0.001)
- Persistent reflux at SPJ in group I: 0.9 % vs group II: 21%
- Decrease in pain intensity on VAS in favor of group II (P= 0.03)
- AVQQ scores: no difference between groups
- Return to work shortened in group I (P<0.05)

**Results at 6 weeks of follow-up:**
- Less neurologic complications in group I (P<0.001)
- Less infections in group I (P<0.05)

Patients with incompetent SPJ + reflux in SSV (106 patients included, 88 assessed at 2Y, 9 patients lost to follow-up in each group

- Group I (N=44): EVLA
- Group II (N=44): OS

**Results at 2 Y**

- Eradication of axial reflux assessed by DUS
  - Group I = 36 (81.2%)
  - Group II= 29 (68.9%)
  - P=0.002

- PREVAIT, sensory disturbance and QoL: no difference between the 2 groups


Patients with GSV incompetence + incompetent saphenofemoral junction + saphenous reflux at least down the knee level

- Tumescent local anesthesia for both procedures
- Group I (N=185): 810-nm diode laser, bare fiber, continuous laser withdrawal, applied energy 20 J/cm2 vein surface
- Group II (N=161): OS

**Results at 5 years of follow-up:**

- 281 legs evaluated (81% of the study population)
  - PREVAIT: Group I, 45%; group II, 54% (P= NS)
  - Recurrence at the same site
    - Group I 18%; group II 5%. P=0.002
    - Recurrence at different site
    - Group I 31%; group II 50%. P=0.002
  - DUS recurrence: reflux at the SFJ:
    - Group I, 28% Group II, 5% (P<0.001)
  - Both treatments improved disease severity and QoL without any difference
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<td>Patients with GSV incompetence + incompetent SFJ in CEAP C2–6. Group I (N=159): HL+ ST Group II (N=142): EVLA Group III (N=148): EVLA+HL Diode 980-nm diode laser, bare fiber, continuous mode in groups II and III. Anesthesia: unknown in group I; local tumescent anesthesia in groups II and III. <strong>Results at 2 (74% of patients) up to 6 years of follow-up (31% of patients)</strong> Clinical recurrence appears with the same frequency in all three treatment groups, but the responsible pathological mechanisms seem to differ. Group I: more recurrence at the SFJ Group II and III: more recurrence into the GVS and tributaries.</td>
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<td>Patients with GSV incompetence Local tumescent anesthesia for both procedures Group I (N 62): 980-nm diode laser, bare fiber, continuous laser withdrawal + postoperative sclerotherapy for persistent varices versus Group II OS (N 68): HL +pin-stripping +tributary stab avulsion <strong>Results at 5 years of follow-up:</strong> Group I: more PREVAIT originating from the SFJ. P&lt;0.04 There were no differences in the relief of venous symptoms, or general QoL between the 2 groups.</td>
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Patients with GSV incompetence

Anesthesia: incomplete information. No tumescence

Group I (N=49): Diode 810-nm diode laser, bare fiber, stepwise laser withdrawal+ HL versus

Group II (N=50): OS

**Results at 5-year of follow-up**

Group I Analysed (N=40); 83% .

Group II. Analysed (N=32); 68%

There was no difference in terms of patient satisfaction as well as CIVIQ2 global index score, VCSS between the 2 groups after treatment. Conversely a significant benefice was noted in all fields when compared to pre-op status. Clinical and DUS recurrence were also similar in both groups

**Abbreviations**

APG = Air Plethysmography; AVVQ = Aberdeen varicose vein questionnaire; AVVSS = Aberdeen varicose vein severity score; DUS = duplex ultrasound; EVLA = endovenous laser ablation; GSV = Great saphenous vein; HL = high ligation; HRQol, health-related quality of life; HVSS = Homburg Varicose Vein Severity Score; PREVAIT = Presence of varices after operative treatment; OS = Open surgery: High ligation + Saphenous stripping +/- Perforator ligation +/- tributary phlebectomy; QALY = quality adjusted life year; QoL = quality of life; ST = GSV stripping; SFJ = saphenofemoral junction; SFP = sapheno popliteal junction; SSV = short saphenous vein; VCSS = Venous clinical severity scoring