### Table VIII. OS versus EVLA.

<table>
<thead>
<tr>
<th>Operative procedure</th>
<th>Reference</th>
<th>Summary</th>
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</thead>
</table>
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  
- Group I (EVLA) 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) |
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<0.001)  
- Total cost lower complications in group I (EVLA) compared with group II |
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<0.01)  
- Less postoperative pain complications in group I (EVLA) compared with group II (P<0.05) |
<table>
<thead>
<tr>
<th>Study</th>
<th>Patients with GSV incompetence</th>
<th>Results at 1, 2 and 6 months of follow-up:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rasmussen LH, Bjoern L, Lawaetz M, Blemings A, Lawaetz B, Eklof B.</td>
<td>Group I (N=62): Diode 980-nm diode laser, bare fiber, stepwise laser withdrawal versus</td>
<td><em>No difference between groups in terms of efficacy and safety</em></td>
</tr>
<tr>
<td>Randomized trial comparing endovenous laser ablation of the great</td>
<td>Group II (N=59): OS</td>
<td><em>Less postoperative pain and bruising in group I (EVLA) compared with group II (P=0.05).</em></td>
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<tr>
<td>saphenous vein with ligation and stripping in patients with</td>
<td>General anesthesia for both procedures</td>
<td></td>
</tr>
<tr>
<td>Darwood RJ, Theivacumar N, Dellagrammaticas D, Mayor AL, Gough MJ.</td>
<td>Patients with GSV incompetence</td>
<td>Results at 3 months of follow-up:</td>
</tr>
<tr>
<td>Randomized Clinical trial comparing endovenous laser ablation with</td>
<td>Group I : EVLA with local tumescent anesthesia, 980-nm diode laser, bare fiber, stepwise laser</td>
<td><em>No difference between groups (EVLA and OS) in terms of reflux abolition and HRQoL (specific questionnaire)</em></td>
</tr>
<tr>
<td>surgery for the treatment of primary great saphenous veins. Br J</td>
<td>withdrawal (N=42), continuous laser withdrawal (N=29)</td>
<td>Group I (EVLA)</td>
</tr>
<tr>
<td>Surg. 2008; 95: 294-301.</td>
<td>*Earlier return to normal activity in group I (EVLA, both laser groups) compared with group II</td>
<td><em>P=0.005</em></td>
</tr>
<tr>
<td>Kalteis M, Berger I, Messie-Werndl S, Pistrich R, Schimetta W,</td>
<td>Patients with GSV incompetence</td>
<td>Results at 1, 4 and 16 weeks of follow-up:</td>
</tr>
<tr>
<td>Pölz W, Hieller F. High ligation combined with stripping and</td>
<td>Anesthesia: incomplete information</td>
<td><em>Less bruising in group I (EVLA) compared with group II (P= 0.001)</em></td>
</tr>
<tr>
<td>endovenous laser ablation of the great saphenous vein: Early results</td>
<td>Group I (N=47): Diode 810-nm diode laser, bare fiber, stepwise laser withdrawal+ HL versus</td>
<td><em>Longer period of time until return to work in group I (EVLA) compared with group II (P= 0.054)</em></td>
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</tbody>
</table>

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<tr>
<th>Patients with GSV incompetence</th>
<th>Local tumescent anesthesia for both procedures</th>
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<tbody>
<tr>
<td>Group I (N = 62): 980-nm diode laser, bare fiber, continuous laser withdrawal + postoperative sclerotherapy for persistent varices <strong>versus</strong></td>
<td></td>
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<tr>
<td>Group II OS (N = 68): HL +pin-stripping +tributary stab avulsion</td>
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**Results at 1 -14 days of follow-up:**
- After 2 weeks more postoperative pain in group II compared to group I (P<0.01)
- After 2 weeks more hindrance in mobility and daily activities in group II compared to group I (P>0.01)

**Results at 1 year of follow-up:**
- No significant differences between groups in terms of DUS recurrence

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<thead>
<tr>
<th>Patients with GSV incompetence</th>
<th>Group I (N = 69 lower limbs): 980-nm diode laser, bare fiber, pulse mode, with local tumescent anesthesia <strong>versus</strong></th>
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<tbody>
<tr>
<td>Group II (N = 60 lower limbs): OS with general anesthesia</td>
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**Results at 2 years of follow-up:**
- Recurrence rates similar in both groups
- Neovascularization less frequent in group I (EVLA) compared with group II (P = 0.001)

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<thead>
<tr>
<th>Patients with GSV incompetence</th>
<th>Group I (N=100): 980-nm diode laser, bare fiber, stepwise mode <strong>versus</strong></th>
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<tr>
<td>Group II (N=100): OS General or spinal anesthesia for both procedures</td>
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**Results at 12 days of follow-up:**
- No difference between groups in postoperative pain, use of analgesics and return time to normal activities
- More hematoma in group II (OS) compared with group I
- More bruising in group I (EVLA) compared with group II

**Results at 1 and 2 years of follow-up:**
- No difference between groups in terms of symptoms, VCSS or HRQoL
- One GSV reopening in group I (EVLA)
<table>
<thead>
<tr>
<th>Study</th>
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<th>Results at 2 years of follow-up:</th>
</tr>
</thead>
</table>
- Clinical or DUS recurrence  
- Clinical severity scores (VCSS;AVQQ)  
- Quality of Life (SF 36) |
| 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. *Br J Surg.* 2011;98:501-10. | Group I (N=140): 810-nm diode, bare fiber, continuous laser withdrawal, continuous power delivery 14W, under local tumescent anesthesia **versus** Group II (N=140): HL+ inversion stripping under general anesthesia Tributaries phlebectomy + perforator ligation in both groups | **Results at 1 week and 1 year of follow-up:**  
Significant improvement after treatment in both groups regarding VCSS & QUALY gain (P < 0.001)  
- Less pain in group I (EVLA) compared with group II (P<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< 0.001) |
| Carradice D, Mekako AI, Mazari FAK, Samuel N, Hatfield J, Chetter IC. Clinical and technical poutcome from a randomized clinical trial of endovenous laser ablation compared with conventional surgery for great saphenous varicose veins. *Br J Surg.* 2011;98:1117-23. | Patients with GSV incompetence + incompetent saphenofemoral junction Group I (N=140): 810-nm diode, bare fiber, continuous laser withdrawal, continuous power delivery 14W under local tumescent anesthesia **versus** Group II (N=140): HL+ inversion stripping under general anesthesia Tributaries phlebectomy + perforator ligation in both groups | **Results at 1 week to 1 year of follow-up:**  
Better initial technical results in group I  
- Less pain in group I (EVLA) compared with group II (P<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< 0.001) |
### Results at 1-year of follow-up:
- Clinical recurrence rate was lower in group I (EVLA) compared with group II (93% vs 92.4%; P= 0.005)
- 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 C2-4 EPAR 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 |
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 versus
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)
Group I (N=44): EVLA versus Group II (N=44): OS
**Results at 2 Y**
Eradication of axial reflux assessed by DUS
- Group I = 36 (81.2%)
  - P=0.002
- Group II= 29 (68.9%)
PREVAIT, sensory disturbance and QoL: no difference between the 2 groups |
| --- | --- |
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 versus
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 |
| Patients with GSV incompetence + incompetent SFJ in CEAP C\textsuperscript{2}eA\textsuperscript{p}AsPr
| 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 2 (74% of patients) up to 6 years of follow-up (31% of patients)**
| 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

| 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
| Group II OS (N 68): HL + pin-stripping + tributary stab avulsion
| **Results at 5 years of follow-up:**
| Group I: more PREVAIT originating from the SFJ. \(P<0.04\)
| There were no differences in the relief of venous symptoms, or general QoL between the 2 groups.

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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

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**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