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To Wear or not to Wear Compression Stockings after Varicose Vein Stripping: A Randomised Controlled Trial

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Abstract *Objectives:* To assess the need to wear compression stockings for 4 weeks after inversion stripping of the great saphenous vein (GSV) from the groin to the level of the knee.
Design: Randomised controlled trial.
Patients: A total of 104 consecutive patients with primary complete incompetence of the GSV treated by inversion stripping of the GSV.
Methods: Postoperatively treated limbs underwent elastic bandaging for 3 days. Volunteers were randomised to wear a compression stocking for additional 4 weeks (intervention group) or no compression stocking (control group). The primary outcome was limb oedema as assessed by photoelectric leg volume measurement. Secondary outcome measures were pain scores, postoperative complications and return to full work.
Results: The control leg volume was 3657 ml (standard deviation, SD 687) preoperatively and 3640 ml (SD 540) 4 weeks postoperatively (non significant, N.S.). The stocking leg volume was 3629 ml (SD 540) preoperatively, falling to 3534 ml (SD 543) ($P < 0.01$) 4 weeks postoperatively. The difference in leg volume between both the groups was not statistically significant. Patients in the control group resumed work earlier (control 11 days, stocking 15 days, $P = 0.02$, Mann–Whitney test). No difference was observed in the number and type of complication and in pain scores during the 4-week follow-up period.
Conclusions: Wearing an elastic compression stocking has no additional benefit following elastic bandaging for 3 days in postoperative care after stripping of the great saphenous vein as assessed by control of limb oedema, pain, complications and return to work.

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The incidence of varicose veins in Dutch primary care is five per 1000 patients, and 18 473 surgical procedures were performed in the Netherlands for varicose veins in 2007.[1,2] The usual surgical treatment of primary varicose veins of the great saphenous vein (GSV) in the Netherlands is saphenous ligation, crossectomy (resection of the proximal great saphenous vein with interruption of all proximal tributaries and flush ligation of the saphenofemoral junction) and stripping of the GSV in the thigh (short stripping of the GSV).[3,4] After GSV stripping, standard practice includes prescription of compression stockings to reduce haemorrhage, oedema, haematoma and pain, based on the guidelines of the Dutch Society for Surgery.[5] Difficulty in applying the compression stocking and discomfort during warm summer weather are frequently reported by patients.

There is little evidence regarding the usefulness of compression therapy after varicose vein surgery; only four randomised controlled trials are available.[6–9] Three of them compared various durations of treatment with elastic stocking[6–8] and one compared 40-mmHg with 15-mmHg stockings,[9] leading to recommendations to wear elastic stockings for 1-week postoperatively and low compression stockings, subsequently, respectively. In contrast, the guidelines of the Dutch Society for Surgery advise elastic compression stockings for 4–6 weeks after GSV stripping.[5]

We hypothesised that since a short period of compression therapy (1 week) after GSV stripping is as effective as 3 weeks' treatment, compression may have no extra benefit over 'no compression' therapy.

Materials and Methods

Study design and patient selection

Consecutive patients undergoing treatment for primary varicose veins due to GSV reflux at the Atrium medical centre Parkstad, Heerlen, the Netherlands, between January and August 2007 were included in the trial. All patients underwent clinical examination and duplex ultrasound investigation as part of their initial assessment. Inclusion criteria were complete incompetence of the GSV on duplex ultrasound and clinical stage C2 or C3 (clinical, etiologic, anatomic and pathophysiologic (CEAP) classification) venous disease.[10] Patients who were unable to wear elastic stockings, patients who already used elastic stockings, and patients with ulcers were excluded. Patients who gave their written informed consent were included. Patients were randomised using a computer-generated randomisation list before the surgical treatment began.[11] Patients in the compression stocking group were measured for an elastic stocking. The randomisation procedure was performed with closed envelopes and the investigators were not aware of the sequence within the envelopes. Due to practical issues, patients and investigators were not blinded after randomisation. Ethical approval was obtained from the medical ethical committee of Atrium medical centre Parkstad.

Intervention

Crossectomy and short GSV inversion stripping using an InvisiGrip Vein Stripper® (LeMaitre, Burlington, Boston, MA, USA) were performed on all patients. All volunteers were operated on as day surgery patients, 90% of whom were treated under spinal anaesthesia.

Both patient groups underwent standard elastic bandaging (Bastos Viegas, Penafiel, Portugal) selective compression of the proximal part of the GSV by a rolled gauze immediately postoperatively for 3 days. After this period, the control group did not wear elastic stockings. The intervention group were fitted with the class 2 medical compression stockings for which they had been measured preoperatively. The stockings provided an estimated compression of 23–32 mmHg (Venotrain® compression stocking, type ''Micro'', Bauerfeind, Zeulenroda, Germany) and patients were advised to wear them postoperatively for 4 weeks. They were advised to wear the stockings day and night for the first 2 weeks and then only during the day for the subsequent 2 weeks.

Outcome measurements

Patients' age, gender, side of removal, and additional surgical procedures (e.g., Muller phlebectomy) were recorded. The primary outcome measure was leg oedema. Secondary outcome measures were pain scores, postoperative complications (bleeding, infection, seroma and sensory disorders) and return to full activity. Volume measurements were done on the same time of the day for the individual patient preoperatively, 3 days, 2 weeks and 4 weeks postoperatively. Limb volume in millilitres (ml) was assessed with an optoelectronic limb volumeter (Perometer® Bösl Medizintechnik, Aachen, Germany). This is a reliable tool for the measurement of limb volume.[12–14] Pain scores were measured using a Visual Analogue Scale (VAS scale), in which 0 signifies no pain and 10 the worst possible pain.[15] Postoperative complications were recorded at each follow-up.

Sample size

Since we hypothesised that there would be no difference between the study groups, sample size calculations were based on the principles of equivalence studies.[16] Based on the assumption of rejecting the null hypothesis when there is a difference between the groups of $\geq$20%, a threshold of equivalence of 20%, similar group sizes, an alpha of 0.05 and a beta of 0.20, it was necessary to include 50 patients in each group.

Statistical analysis

Due to dependence of data, one leg only of each patient was used for analysis. If two legs were operated on, the right leg was used for analysis. Changes over time in leg volume were analysed using repeated measurement analysis of covariance (ANCOVA). Differences between the two groups were analysed for significant differences by adding the group as the between-subject factor in the repeated measurement and baseline leg volume as the covariate. Changes in VAS score were analysed in the same way.

Complications are presented as dichotomous data. Differences between the intervention and control groups in