Meta-analysis of subfascial endoscopic perforator vein surgery (SEPS) for chronic venous insufficiency

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CRD summary
The authors concluded that compared with open perforating vein surgery subfascial endoscopic perforator vein surgery was associated with a reduction in wound infection, ulcer recurrence and hospital stay. The authors' conclusion reflected the evidence presented. However, without further details on study quality and given the other methodological concerns it is difficult to judge the reliability of these conclusions.

Authors' objectives
To assess the benefits and harms of subfascial endoscopic perforator vein surgery in the treatment of chronic venous insufficiency.

Searching
MEDLINE, EMBASE, Cochrane Database of Systematic Reviews and DARE were searched from 1985 to 2007. Search terms were reported.

Study selection
Randomised controlled trials (RCTs) and retrospective comparative studies that compared subfascial endoscopic perforator vein surgery with open perforating vein surgery in adult patients with chronic venous insufficiency were eligible for inclusion. Patients had to have clinically documented primary symptomatic varicose veins attributable to saphenofemoral junction incompetence and long saphenous vein reflux confirmed using duplex ultrasonography. Eligible patients had limbs with at least one incompetent perforating vein confirmed using duplex scan, and had skin changes or a healed or an active ulcer on the medial part of the lower leg. Studies that reported the number of patients with active ulceration at the time of surgery and with ulcer healing during follow-up were eligible for inclusion. The primary review outcomes were mortality and morbidity, including procedure-specific adverse events and postoperative complications (infection and deep venous thrombosis). Additional outcomes were overall ulcer healing, ulcer recurrence, operating time, blood loss and hospital stay.

Included studies were published between 1997 and 2001. The disease classification of chronic venous insufficiency regarding clinical, aetiological, anatomical and pathological elements varied from 4 to 6. Most included studies permitted concomitant therapy with saphenous ablation. The mean age of included patients varied from 60 to 70 years.

The authors stated neither how the papers were selected for the review nor how many reviews performed the selection.

Assessment of study quality
The quality of studies were assessed using the Jadad scale, a five-point scale to evaluate randomisation, blinding, withdrawal and allocation concealment.

The authors did not state how many reviewers performed the validity assessment.

Data extraction
Data were extracted on the number of patients who experienced an event. Odds ratios (ORs) for dichotomous data, with 95% confidence intervals (CIs), were calculated. Standard deviations were calculated for studies that presented continuous data as mean values.

The authors did not state how many reviewers performed the data extraction.
Methods of synthesis
The studies were combined in meta-analyses (Mantel-Haenszel fixed-effects model). Pooled odds ratios for dichotomous outcomes, with 95% CIs, were calculated. Weighted mean differences (WMDs) for continuous outcomes, with 95% CIs, were also estimated. Statistical heterogeneity was investigated using $X^2$ and $I^2$ statistics. Publication bias was visualised using funnel plots.

Results of the review
Three studies (two RCTs and one retrospective comparative study) were included in meta-analyses (n=118). Study quality assessment results were not reported. Follow-up duration varied from 21 to 56 months.

Compared with open perforating vein surgery, subfascial endoscopic perforator vein surgery was significantly associated with a reduction in wound infections (OR 0.06, 95% CI 0.02 to 0.05; two trials), a reduction in recurrent ulcers (OR 0.31, 95% CI 0.1 to 0.90; three trials) and a reduction in hospital stay (OR -8.96, 95% CI -11.62 to -6.30; two trials). There were no statistically significant differences in the rate of mortality, deep vein thrombosis, hospital readmission and ulcer healing at four months between the two groups.

Statistically significant heterogeneity was only observed in the outcome of hospital stay ($p=0.0003$, $I^2=92.4\%$). No publication bias was suggested by visual scanning of funnel plots.

Authors’ conclusions
Subfascial endoscopic perforator vein surgery was associated with a reduction in wound infection, ulcer recurrence and hospital stay.

CRD commentary
This review’s inclusion criteria were clear. Several relevant databases were searched. Efforts were made to find published studies, but not unpublished studies, which introduced a risk of publication bias. Publication bias could not be ruled out due to the small number of studies; publication bias was assessed using funnel plots, which might not have been appropriate given the very small number of studies. The authors did not state whether language restrictions were applied in the search, which made it difficult to assess the risk of language bias. It was unclear whether sufficient attempts were made to minimise the biases and errors in the review process. Relevant criteria were used to examine the study quality, but the results were not presented in the report.

Statistical heterogeneity was assessed. In general, appropriate statistical methods were used to pool the results. However, using a fixed-effect model to pool the outcome of hospital stay in the presence of significant heterogeneity might not be appropriate. Without further details on study quality and given the other methodological concerns it is difficult to judge the reliability of the authors’ conclusions.

Implications of the review for practice and research
Practice: The authors stated that subfascial endoscopic perforator vein surgery in combination with ligation of the saphenofemoral junction and continued compression therapy can be performed safely with fewer early postoperative complications in the treatment of chronic venous insufficiency.

Research: The authors stated that further large prospective randomised trials were required to evaluate the long-term benefits of subfascial endoscopic perforator vein surgery and to differentiate the effects of compression therapy and concomitant superficial venous surgery in the management of severe venous disease. Trials should exclude patients with post-thrombotic legs.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.