Meta-analysis of endovenous radiofrequency obliteration of the great saphenous vein in primary varicosis

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CRD summary
This review compared radiofrequency obliteration and conventional surgery in patients with obliteration of the great saphenous vein in primary varicosis. The authors concluded that radiofrequency obliteration benefited most patients in the short term, but longer follow-up was needed to determine specific outcomes. The absence of detail on the review process potentially limits the reliability of this conclusion.

Authors' objectives
To compare the safety and effectiveness of radiofrequency obliteration and conventional surgery in patients with obliteration of the great saphenous vein in primary varicosis.

Searching
MEDLINE, EMBASE, Cochrane Database of Systematic Reviews and DARE were searched. Search dates spanned 1994 to 2007. Search terms were reported.

Study selection
All studies that compared radiofrequency obliteration great saphenous vein ablation with conventional surgery (vein ligation and stripping) were eligible for inclusion. Studies had to report at least one of the following safety outcomes: mortality and morbidity (including radiofrequency obliteration-related postoperative infection, thrombosis, pain, bleeding, ecchymosis, paraesthesia, induration and phlebitis), effectiveness outcomes (abolition of reflux, re-treatment rate, re-canalisation, neo-vascularisation and reduction of symptoms) or quality of life (physical, global, pain, return to normal activity and return to work) and other clinical indicators of venous-related severity and disability.

The included patients were over the age of 18 and had primary venous reflux confirmed by duplex ultrasonography of the great or small saphenous veins. The authors stated that the included studies varied on patient risk profiles and symptomatology, outcome definition and measurement. Adverse event outcomes were reported, where possible, at 72 hours, one and three weeks and four to six months. Effectiveness outcomes were measured up to two years.

The authors did not state how many reviewers carried out study selection.

Assessment of study quality
Study quality was assessed using the Jadad scale for randomised studies (scores 1 to 5, with 5 the highest quality) and a modified version of the Newcastle-Ottawa Scale for non-randomised studies.

The authors did not state how many reviewers carried out quality assessment.

Data extraction
Data were extracted to enable the presentation of odds ratios (OR) or mean differences, with 95% confidence intervals. Yates correction was used for studies that contained a zero event in one of the cells.

The authors did not state how many reviewers carried out data extraction.

Methods of synthesis
Odds ratios, weighted mean differences (WMDs) and 95% confidence intervals were pooled using a random-effects meta-analysis. Both random-effects and fixed-effect models were used to assess heterogeneity and the $I^2$ statistic was presented. Funnel plots were used to assess publication bias. Quality of life data were synthesised qualitatively using a
vote-counting method.

Results of the review

Eight studies (n=419) were included in the review: six randomised controlled trials (RCTs) (n=287), one non-RCT (n=102) and one retrospective study (n=30). One RCT scored 4, three RCTs scored 3, one RCT scored 2 and one RCT scored 1 on the Jadad scale.

Significant benefits were reported for radiofrequency obliteration in terms of ecchymosis at one week (OR 0.26, 95% CI 0.10 to 0.67; number of RCTs not reported) and haematoma at 72 hours (OR 0.16, 95% CI 0.04 to 0.59, I^2=32.4%; three RCTs), one week (OR 0.15, 95% CI 0.06 to 0.38; number of RCTs not reported) and three weeks (OR 0.16, 95% CI 0.04 to 0.60; number of RCTs not reported). No significant differences were reported between radiofrequency obliteration and conventional surgery in terms of overall postoperative complications at four months (two RCTs) and in most individual complications at earlier time points (seven RCTs).

No significant differences were reported for the effectiveness of treatments in terms of immediate or complete great saphenous vein occlusion, incomplete great saphenous vein closure and abolition of reflux at any time up to two years, recurrent varicose veins and re-opening at two years, and neovascularisation.

All studies that measured quality of life (six studies) revealed improvements following radiofrequency obliteration. The authors specifically drew attention to return to normal activity (WMD -2.83, 95% CI -4.41 to -1.25; number of RCTs not reported) and return to work (OR -7.19, 95% CI -9.59 to -4.78; four RCTs; there was a discrepancy in the paper for this result).

Significant heterogeneity was reported for the outcomes of reflex, pain and global score of quality of life. There was no significant heterogeneity for all other outcomes measured in more than one study. Publication bias was not considered to be a threat.

Authors’ conclusions

Radiofrequency obliteration can benefit most patients in the short term, but re-canalisation, re-treatment, occlusion and reflux might change with longer follow-up.

CRD commentary

The review question was clear and supported by potentially reproducible inclusion criteria. The search strategy accessed some relevant data sources, although the extent to which unpublished material was sought was unclear. The review process was not reported in any detail, so error and bias could not be ruled out. Relevant quality assessment criteria were applied to the different study designs and indicated that study quality was less than optimal. Heterogeneity and publication bias were assessed. The chosen method of synthesis appeared to be appropriate.

The authors’ acknowledgement of the review’s limitations (such as heterogeneous data and absence of some reporting within the included studies) appeared justified. The authors’ cautious conclusion reflected the evidence presented, but a lack of reported detail on the review process made the reliability of the conclusion uncertain.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors stated that further RCTs that compared radiofrequency obliteration to conventional surgery were needed to investigate long-term consequences. Future trials should carry out preoperative identification of patients likely to experience recurrent disease.

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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.