Does minimally invasive vein harvesting technique affect the quality of the conduit for coronary revascularization?


CRD summary
This review compared minimally invasively versus conventionally harvested veins. The authors concluded that the methods are comparable in several measures of macroscopic quality, patency and post-operative myocardial infarction, but minimally invasive vein harvesting requires a significantly larger number of repairs. Despite limitations the conclusions appear reliable.

Authors' objectives
To evaluate the macroscopic quality, post-operative myocardial infarction (MI) rates and angiographic patency of minimally invasively harvested veins compared with conventionally harvested veins.

Searching
MEDLINE, EMBASE, and the Cochrane Library were searched from 1997 to 2004; the search was widened by use of the ‘related articles’ database function. In case of multiple publications, the better quality or the most recent publication was chosen.

Study selection
Study designs of evaluations included in the review
Comparative studies were eligible for inclusion.

Specific interventions included in the review
Studies comparing minimally invasive vein harvesting with conventional vein harvesting for coronary artery bypass grafting performed at the same institution were eligible for inclusion. Conventional harvesting was defined as the use of a continuous skin incision or multiple interrupted incisions along the length of the great saphenous vein; minimally invasive techniques had to be documented as endoscopic or non-endoscopic great saphenous vein harvest. The equipment used for the endoscopic minimally invasive procedure varied (e.g. Ethicon Endo-Surgery Vein Harvest Equipment, VasoView) as did the equipment for non-endoscopic procedures (e.g. Autosuture, SaphLITE).

Participants included in the review
The review did not specify any inclusion criteria for the patients.

Outcomes assessed in the review
The studies had to report on vein length, macroscopic scoring by surgeon, proportion of veins requiring repair, number of repairs to each vein, incidence of post-operative Q-wave or non-Q-wave MI occurring within 1 year post-operatively, or angiographic patency to be eligible. Studies with no events in both groups for the outcomes of interest were excluded, as were studies in which the outcomes of interest were not reported for the two techniques or it was impossible to calculate this from the published results. The review reported on all outcomes of interest.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.
Data extraction
Two reviewers independently extracted the study characteristics and the described outcomes of interest.

Methods of synthesis
How were the studies combined?
Categorical data were summarised as pooled odds ratios with respective 95% confidence intervals (CIs) using a random-effects model (Mantel-Haenszel method). Continuous variables were summarised using the weighted mean difference (WMD).

How were differences between studies investigated?
Statistical heterogeneity was assessed with a chi-squared test and the I-squared statistic. Subgroup analyses of RCTs alone were compared with the overall results, and the effects on heterogeneity were investigated.

Results of the review
Thirty-two studies (n=4,812) were included: 15 randomised controlled trials (RCTs; n=1,755) and 17 prospective non-randomised controlled studies (n=3,057).

Minimally invasively harvested veins required more repairs prior to grafting than conventionally harvested veins (WMD 1.28, 95% CI: 0.52, 2.04; based on 4 studies). All studies showed an advantage of the conventionally harvested veins, but there was evidence of statistical heterogeneity (p=0.0007).

There was no significant difference between the two techniques in the length of the venous conduit, the proportion of harvested veins requiring repair, the surgeon assessed macroscopic quality of vein, post-operative MI or angiographic patency. This was also the case when RCTs alone were assessed.

Authors’ conclusions
Minimally invasive and conventional vein harvesting are comparable in length, proportion of veins requiring repair and surgeon-assessed macroscopic grading of the harvested vein. However, minimally invasive vein harvesting requires a significantly larger number of repairs.

CRD commentary
The review stated a clear research question and several clear inclusion criteria. A limited search was conducted and there were no attempts to locate unpublished studies, other than those identified in the Cochrane Library, which might have introduced publication bias into the review. The authors did not report a formal assessment of validity, so the quality of the individual included studies was unclear. Several studies employed only small samples and not all studies reported on all outcomes, hence most results are based on limited data. The pooling of the included studies showed statistical heterogeneity, although this was further explored. Very little information on the included patients was presented; it is unclear whether variation between them could explain differences between the studies. The reviewers undertook measures to reduce errors and bias in the data extraction but did not report the use of such measures when screening studies for inclusion. Overall, the conclusions appear reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that comparative research on angiographic patency using computed tomography, magnetic resonance angiography and direct coronary angiography techniques are necessary to conclusively answer the question of whether minimally invasive or conventional vein harvesting grafts are comparable in quality.

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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.