A contemporary meta-analysis of Dacron versus polytetrafluoroethylene grafts for femoropopliteal bypass grafting

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CRD summary
The authors concluded that Dacron or polytetrafluoroethylene grafts could be used for femoropopliteal bypass grafting with no significant differences in graft patency at five years when the autologous saphenous vein was unavailable.Acknowledged differences between trials plus lack of reporting of review methods, trial quality, and statistical comparison of patency rates make it difficult to assess reliability of the conclusion.

Authors' objectives
To compare patency rates of polyester (Dacron) grafts with polytetrafluoroethylene grafts in patients undergoing femoropopliteal bypass grafting.

Searching
MEDLINE (from 1966), EMBASE (from 1991) and the Cochrane Library were searched to October 2009. Search terms were reported. Reference lists of identified articles, reviews and commentaries were screened.

Study selection
Randomised controlled trials (RCTs) that compared Dacron with polytetrafluoroethylene grafts in patients undergoing femoropopliteal bypass grafting were eligible for inclusion.

The review assessed patency rates at one, two, three, four and five years.

The included trials evaluated a variety of types of Dacron graft including collagen-impregnated, gelatin-sealed, collagen-coated heparin-bonded, fluoropolymer-coated and unsealed; a few trials used expanded polytetrafluoroethylene grafts.

In just over half of the included trials, patients underwent below-knee grafting; in the other trials, patients underwent above knee grafting.

The authors did not state how papers were selected for the review.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Hazard ratios (HR) for graft occlusion were extracted. Survival (patency) data were extracted from the text, life tables and survival curves. For each trial, log hazard ratios were calculated for each one-month interval; these were combined to provide an estimate of the overall log hazard ratio for individual trial. Within-trial variances were also calculated. Details of methods were reported. A small value was added to cells with zero events in one treatment group over a specific time interval.

The authors did not state how many reviewers extracted data.

Methods of synthesis
Cumulative patency rates with 95% confidence intervals (CIs) were calculated separately for Dacron and polytetrafluoroethylene grafts for one, two, three, four and five years.

Pooled weighted log hazard ratios with 95% confidence intervals (CIs) were calculated using a fixed-effect model in the absence of significant heterogeneity; otherwise a random-effects model was used. Heterogeneity was assessed using the $X^2$ statistic.
Sensitivity analysis was performed to examine the influence of individual trials.

The potential for publication bias was assessed using a funnel plot and Egger's test.

**Results of the review**

Seven RCTs were included (n=1,521 patients). Duration of follow-up ranged from two to ten years.

Pooled cumulative patency rates at five years were 49.2% (95% CI 45.6 to 52.7) for Dacron grafts and 38.4% (95% CI 32.2 to 44.6) for polytetrafluoroethylene grafts.

There was no statistically significant difference in the risk of graft occlusion between Dacron and polytetrafluoroethylene grafts (HR 0.87, 95% CI 0.67 to 1.12; random-effects model). Significant heterogeneity was found (p=0.03).

After excluding the trial that used fluoropolymer coated Dacron, Dacron grafts were associated with a significant reduction in the graft occlusion with no significant heterogeneity (HR 0.75, 95% CI 0.63 to 0.89; fixed-effect model).

For patients with above-knee femoropopliteal bypass grafts, Dacron grafts were associated with a significant reduction in graft occlusion compared with polytetrafluoroethylene grafts (HR 0.71, 95% CI 0.57 to 0.89; three trials; fixed-effect model).

There was no evidence of significant publication bias from Egger’s test.

**Authors’ conclusions**

Either Dacron or polytetrafluoroethylene grafts could be used for femoropopliteal bypass grafting with no significant differences in mid-term graft patency (49.2% versus 38.4% at five years) when the autologous saphenous vein was unavailable. Dacron grafts may be superior to polytetrafluoroethylene grafts for patency when they were not fluoropolymer-coated or when they were used in above-knee bypass grafting.

**CRD commentary**

The review question was clearly stated and inclusion criteria were appropriately defined. Several relevant sources were searched, but no attempts to minimise publication or language bias were reported. Methods used to select studies and extract data were not described, so it was not known whether efforts were made to reduce reviewer errors and bias.

Trial quality was not assessed, so results from these trials and any synthesis may not be reliable. Little information was provided about participants, which made it difficult to judge the general applicability of review findings. In addition, methods used to assess patency and definitions of patency and occlusion were not reported. Data were pooled using meta-analysis. Heterogeneity was assessed, and the trial responsible for heterogeneity was identified. The authors acknowledged the differences between trials for the type of Dacron graft and site of grafting.

The review statistically compared occlusion rates between graft types, but did not report any statistical comparison of patency rates, so it was not clear if results were comparable for patency. This, in addition to the lack of reporting of review methods and included trial quality, and lack of definitions and methods of determining occlusion and patency, makes it difficult to assess the reliability of the authors’ conclusions.

**Implications of the review for practice and research**

The authors did not state any implications for practice or research.

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