A meta-analysis of patellar tendon autograft versus patellar tendon allograft in anterior cruciate ligament reconstruction

Krych A J, Jackson J D, Hoskin T L, Dahm D L

CRD summary
The authors concluded that in primary anterior cruciate ligament reconstruction, bone-patellar tendon-bone (BPTB) autograft was favoured over BPTB allograft for outcomes of graft rupture and hop test only. This finding was sensitive to the method of sterilisation of the autograft. Due to lack of quality assessment and small numbers of included participants, the authors' conclusions should be interpreted with caution.

Authors' objectives
To compare the effectiveness of bone-patellar tendon-bone (BPTB) autograft and BPTB allograft in primary anterior cruciate ligament (ACL) reconstruction.

Searching
The electronic databases MEDLINE, EMBASE, Scopus and Web of Science were searched until 2006, with no language restrictions. Search terms were reported. The reference lists of all included papers were also manually searched in order to identify additional articles.

Study selection
Eligible for inclusion in the review were comparative studies of BPTB autograft with prospective data, a minimum 2 year follow up, identical rehabilitation protocols, and a subjective and an objective assessment of outcome. Allografts other than BPTB (e.g. Achilles, tibialis anterior tendon) were excluded from the review. Although not specified in the inclusion criteria, primary outcome measures were: graft failure/re-rupture, rate of reoperation, Lachman manual examination, pivot shift scores, absence versus presence of patellofemoral crepitus, return to pre-injury activity level, hop test greater than 90% of non-operative side, and "normal or nearly normal versus outcomes worse than this" for International Knee Documentation Committee (IKDC) scores (IKDC A and B versus IKDC C and D).

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
Data was extracted in order to calculate odds ratios (OR) and 95% confidence intervals (CI). Where data was reported at two time points, only data from the longest follow-up were used.

Two reviewers performed the data extraction and any inconsistencies were re-examined and then resolved in an unspecified manner.

Methods of synthesis
ORs were combined in a meta-analysis using the DerSimonian and Laird random-effects model. Heterogeneity was assessed using the Mantel-Haenszel Q-statistic. Sources of heterogeneity were investigated using sensitivity analysis.

Results of the review
Six non-randomised controlled trials (n=534) were included in the review. The sample sizes ranged from 60-268.

There were significantly more graft ruptures in the allograft group compared to the autograft group (5 studies, OR 5.03, 95% CI: 1.38, 18.33, p=0.01) with no evidence of statistically significant heterogeneity.
Significantly more participants in the autograft group were able to perform a hop test of greater than 90% of the non-operative side (3 studies, OR 5.66, 95% CI: 3.09, 10.36, p<0.01). Again, there was no evidence of statistically significant heterogeneity.

There was no statistically significant difference between the autograft and allograft groups in terms of the Lachman examination and the IKDC score. However, both these outcomes exhibited statistically significant heterogeneity (Q statistic: 17.4, p<0.01, and Q statistic: 26.7, p<0.01 respectively).

There was no statistically significant difference between the allograft and autograft groups and no evidence of statistically significant heterogeneity for the remaining outcomes of rate of reoperation, pivot shift scores, absence versus presence of patellofemoral crepitus and return to pre-injury activity level.

Sensitivity analysis performed by excluding one trial (the largest one), which used a different technique for preparing and sterilising the allografts (radiation and acetone drying), resulted in the absence of statistically significant heterogeneity for all outcome measures. It showed that there was no statistically significant difference between autografts and allografts with respect to graft rupture (OR and CI not reported, p=0.37) or hop test greater than 90% of the non-operative side (OR and CI not reported, p=0.34).

Authors' conclusions
ACL reconstruction with BPTB autograft was favoured over BPTB allograft for graft rupture and hop test outcome. However, when irradiated and chemically processed grafts were excluded, results were not significantly different between the two graft types for any outcome.

CRD commentary
The review addressed a clear research question and was supported by clear inclusion criteria. The search strategy was adequate and included searching for studies in languages other than English, which reduced the possibility of language bias. However, there was no apparent attempt to search for unpublished material, which means that relevant studies may have been missed. The authors do not state how the papers were selected for review or how many reviewers performed the selection, which may mean that the selection process was subject to bias. Furthermore, there was no formal assessment of the validity of the included studies although some quality data was presented (relating to randomisation and independent outcome assessment). Data extraction was performed by two reviewers and inconsistencies discussed, although how these were resolved was unspecified. Adequate details of the primary studies were provided. However, although 616 participants were enrolled in the studies, the authors state, without explanation, that only 334 participants were evaluated. In the sensitivity analysis, the removal of the trial that used a different technique for preparing and sterilising the allografts, removed almost half of the participants in the analyses for graft failure and hop test. Therefore the fact that the results of the sensitivity analysis were no longer statistically significant is not surprising. Due to the lack of formal validity assessment and the small number of patients in the included studies, the authors' conclusions should be interpreted with caution.

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

Funding
Not stated

Bibliographic details

PubMedID
18308180
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.