Unicompartmental knee arthroplasty for the treatment of unicompartmental osteoarthritis: a systematic study

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CRD summary
The review aimed to assess the safety and efficacy of unicompartmental knee arthroplasty compared with total knee arthroplasty and high tibial osteotomy in unicompartmental osteoarthritis. It concluded that the results suggest at least an equivalency of unicompartmental knee arthroplasty when compared with either of the other interventions. The conclusions appear to correctly reflect the limitations of the available evidence.

Authors' objectives
To assess the safety and efficacy of unicompartmental knee arthroplasty (UKA) compared with total knee arthroplasty (TKA) and high tibial osteotomy (HTO) in unicompartmental osteoarthritis.

Searching
MEDLINE (1950 to 2004), EMBASE (1980 to 2004), Current Contents (May 2004), the Cochrane Library (Issue 2, 2004), a U.S. clinical trials database, NHS Centre for Reviews and Dissemination databases (including HTA) and the National Research Register were searched; the search strategy was reported. Bibliographies in the retrieved studies were screened for other relevant references. No language restrictions were applied at this stage.

Study selection
Study designs of evaluations included in the review
Comparative studies (both randomised and non-randomised) were eligible for inclusion. Follow-up in the included studies lasted between 6 months (minimum) and 17 years (maximum).

Specific interventions included in the review
Studies of UKA in comparison with TKA and HTO were eligible for inclusion. Only studies of primary procedures were included.

Participants included in the review
Studies of humans, specifically of patients diagnosed with unicompartmental osteoarthritis of the medial or lateral compartments of the knee were eligible for inclusion. The inclusion criteria were not specified in terms of participants but it was clear that studies of patients with unicompartmental osteoarthritis undergoing UKA, TKA and HTO were eligible. In the full systematic review, the inclusion criteria concerning participants were specified in more detail; patients with rheumatoid arthritis were not eligible (see Other Publications of Related Interest).

Outcomes assessed in the review
The outcomes of interest were complications after the surgical intervention, knee function scores, and revision rates for UKA, TKA and HTO prostheses. In the full systematic review, the inclusion criteria concerning outcomes were specified in more detail (see Other Publications of Related Interest).

How were decisions on the relevance of primary studies made?
Two reviewers independently performed the study selection. Any disagreements were resolved through discussion.

Assessment of study quality
The authors stated that validity was assessed on parameters such as study design, quality of reporting, methods of randomisation, allocation concealment, blinding, attempts to minimise bias, statistical methods, statistical power and external validity of the studies. The evidence was rated based on criteria proposed by the Australian Safety and
Efficacy Register of New Interventions Procedures - Surgical (ASERNIP-S) classification system. It is not clear whether two reviewers were involved in the validity assessment. The authors also classified the included studies according to a hierarchy of study design. Detailed results of this validity assessment can be found in the full systematic review (see Other Publications of Related Interest); the authors followed established criteria proposed by the Cochrane Collaboration.

Data extraction
The data were extracted onto a standardised form. One reviewer extracted the data and a second reviewer checked the extraction.

Methods of synthesis
How were the studies combined?
The studies were grouped according to the interventions being evaluated and combined in a narrative, with accompanying tables presenting details of complications, knee function scores and revisions. Meta-analyses were not considered appropriate.

How were differences between studies investigated?
Differences between the studies were discussed in the text of the review.

Results of the review
Nine studies (1,565 knees) assessed UKA in comparison with TKA: 1 randomised controlled trial (RCT, 102 knees), 6 concurrent non-randomised trials (459 knees) and 2 retrospective comparative studies (1,004 knees).

Six studies (334 knees) assessed UKA in comparison with HTO: 2 RCTs (102 knees), 2 concurrent non-randomised trials (60 knees) and 2 retrospective comparative studies (172 knees).

Safety.
No significant differences in the overall rates of complications could be found between UKA and TKA, although deep vein thrombosis appeared to be reported more frequently after TKA than UKA. When UKA and HTO were compared, it appeared that complications (mainly deep vein thrombosis and wound complications) were reported more often with HTO.

Efficacy.
Knee function and post-operative pain were difficult to compare across the studies because of the various scoring systems used. UKA appeared to be equivalent to TKA and HTO. The range of motion was generally greater with UKA than TKA and HTO.

There was a trend towards higher survival of prostheses (based on revision rates) for TKA than UKA in the follow-up between 3 and 10 years after implantation, but this was not statistically significant. When UKA was compared with HTO, 1 RCT found significantly more revisions at 4.5 years' follow-up in the HTO patients (relative risk 0.64, 95% confidence interval: 0.27, 1.54).

The evidence base was rated average according to the ASERNIP-S classification system.

Authors' conclusions
The results suggest at least an equivalency of UKA when compared with TKA and HTO in terms of safety and efficacy. With respect to knee survival, the efficacy of UKA and HTO could not be determined.

CRD commentary
The review addressed a clear research question. Several relevant sources were searched, the search terms were reported, and attempts were made to locate unpublished studies. The validity of the included studies was assessed using established criteria and adequate study details were given. In view of the differences between the studies, a narrative synthesis was appropriate. The authors highlighted and considered in their conclusion that the available evidence was limited in both quantity and quality. In summary, the review was well-conducted. The conclusions appear to correctly reflect the limitations of the available evidence.

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

Research: The authors stated that there is still a need for well-conducted RCTs measuring well-validated outcomes regarding the surgical treatment of unicompartmental osteoarthritis. The cost-effectiveness of the available options needs to be clarified.

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Other publications of related interest

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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.