A systematic review of total wrist arthroplasty compared with total wrist arthrodesis for rheumatoid arthritis
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CRD summary
The authors concluded that total wrist arthrodesis had similar and possibly better outcomes than arthroplasty for patients with rheumatoid arthritis; there was no support for the widespread use of wrist arthroplasty. In view of the limited search, lack of reporting of review methods and lack of direct comparison of arthrodesis and arthroplasty, the authors' conclusions may not be reliable.

Authors' objectives
To compare total wrist arthroplasty with total wrist arthrodesis in patients with rheumatoid arthritis.

Searching
MEDLINE was searched from inception to October 2006 for studies published in English. Search terms were reported. In addition, reference lists were screened.

Study selection
Studies that evaluated the effects of either total metal-plastic wrist arthroplasty or total wrist arthrodesis on complications, frequency of complications, revisions and additional operations in patients with rheumatoid arthritis were eligible for inclusion. Studies had to have at least 10 patients. At least 80 per cent of patients had to either have rheumatoid arthritis or outcomes had to be reported separately for patients with rheumatoid arthritis. Studies that evaluated revision operations or novel techniques and studies with an average follow-up of less than one year were excluded. The review assessed pain, range of motion for arthroplasty, grip strength, satisfaction, major complications (requiring operative management), minor complications, non-union for arthrodesis, revision or re-operation, removal of prosthesis and salvage arthrodesis.

The authors stated that most studies were small retrospective case series. Studies evaluated at least 10 different types of arthrodesis and 10 types of arthroplasty including third-generation prostheses. Where reported, studies included patients with end-stage rheumatoid arthritis and advanced joint destruction. Most patients were women. The mean age was approximately 56 years.

The authors stated neither how papers were selected for the review nor how many reviewers performed the selection.

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

Data extraction
Data extracted included post-operative outcomes, pre-operative pain and pre-operative range of motion for arthroplasty studies. Where possible, pain measures were converted to a dichotomous variable (no or mild pain versus moderate to severe pain). Where studies reported that all patients had excellent pain relief, this was accepted by the reviewers. The authors stated neither how data were extracted for the review nor how many reviewers performed the data extraction.

Methods of synthesis
Characteristic of patients (percentage of women, mean age and mean follow-up period) were compared between arthroplasty and arthrodesis studies. Mean percentages of patients with outcomes of interest were calculated for each treatment group. Results for third-generation arthroplasty prosthesis were reported separately. Studies that reported pain on a visual analogue scale were excluded from the analysis. One study that reported complete failure for all patients after arthroplasty using a single design of prosthesis (APH) was excluded from the analysis of complications.

Results of the review
Twenty studies evaluated arthrodesis (n=860) and 18 studies evaluated arthroplasty (n=503). The number of wrists per study ranged from 12 to 140. Third-generation prostheses were inserted in 332 patients. Treatment groups were similar with respect to the percentage of women (79 per cent), mean age (56 and 57 years) and mean duration of follow-up (4.5 years). Studies did not consistently report disease severity or pre-operative measures of function.

Pain: Mild or no pain was reported by 90 per cent of patients undergoing arthroplasty, 98 per cent undergoing arthrodesis and 91 per cent who received a third-generation arthroplasty prosthesis.

Range of motion: Only three of the 14 studies that reported average flexion, extension and radial and ulnar deviation showed an average range of motion within the functional range for all values (5° flexion, 30° extension, 10° radial deviation and 14° ulnar deviation as described by Palmer).

Complications and revision: Total complication rates were 30 per cent for arthroplasty and 17 per cent for arthrodesis. Major complications were more common after arthroplasty (25 per cent) and third-generation prosthesis (21 per cent) than arthrodesis (13 per cent). Revision or re-operation rates were 15 per cent for arthrodesis, 21 per cent for arthroplasty (5.4 per cent requiring prosthesis removal and salvage arthrodesis) and 17 per cent for third-generation arthroplasty (six per cent requiring prosthesis removal or salvage arthrodesis).

Satisfaction: Percentages of patients reporting satisfaction were 91 per cent for arthroplasty and 93 per cent for arthrodesis.

**Authors' conclusions**
Total wrist arthrodesis had similar and possibly better outcomes than arthroplasty for patients with rheumatoid arthritis. There was no support for the widespread use of arthroplasty in these patients.

**CRD commentary**
The review question was clearly stated. Inclusion criteria were defined for intervention, participants, outcomes and some aspects of study design. Limiting the search to studies published in English and identified in one database plus references may have resulted in the omission of other relevant studies and raised the potential for publication and language bias. Methods used to select studies and extract data were not described, so it was not possible to tell if any efforts were made to reduce reviewer errors and bias. Pooling mean percentages of patients with outcomes of interest from such diverse studies without some indication of the variation in rates among studies may not have been appropriate. Validity was not assessed, but the reviewers discussed some limitations of the included (apparently largely retrospective) studies. Conclusions regarding the relative effect of arthrodesis and arthroplasty were based on comparisons between subgroups of trials, rather than on direct comparisons within trials, so any conclusions drawn about their relative effects were not definitive. In view of the limited search, lack of reporting of review methods and lack of direct comparison of arthrodesis and arthroplasty, the authors’ conclusions may not be reliable.

**Implications of the review for practice and research**
Practice: The authors stated that review findings did not support the widespread use of wrist arthroplasty for patients with rheumatoid arthritis.

Research: The authors stated that there was a need for large multicentre randomised controlled trials to directly compare arthroplasty with arthrodesis in patients with rheumatoid arthritis. Studies should be long-term and assess standardised pre and post-operative function, quality of life and rates of revision surgery.

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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.