The outcome of elbow ulnar collateral ligament reconstruction in overhead athletes: a systematic review
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CRD summary
This review of ulnar collateral ligament (UCL) reconstruction techniques in overhead athletes found muscle-splitting of the flexor-pronator mass, decreased handling of the ulnar nerve and the docking technique resulted in improved outcomes. The validity of conclusions may be limited by inclusion of non-randomised trials, possible publication bias, methods of study selection, validity assessment and data extraction, and the summation of some results across heterogeneous studies.

Authors’ objectives
To determine which ulnar collateral ligament (UCL) reconstruction techniques were associated with better outcomes in overhead athletes and to assess the strengths and weaknesses of current data.

Searching
The MEDLINE database was searched from 1950 until November 2007. The search terms were reported. Reference lists of identified studies and review articles were also searched.

Study selection
To be eligible for inclusion, studies had to follow-up a cohort of athletes for a minimum of one year following UCL reconstruction. Studies in abstract form only were not included. The reported outcomes were return to competition (those graded ‘excellent’ in Conway-Jobe ratings of athlete recovery), mean time to return to sport, range of motion and complications.

The included studies, the flexor-pronator mass approach techniques were muscle-splitting (67% of procedures), detachment (17%) and retraction (16%). Figure-of-8 graft fixation techniques included humeral tunnels placed posteriorly in 40% of procedures, anteriorly in 22% of procedures and medial opioid in 38%. The graft choice was ipsilateral palmaris longus (48%), contralateral palmaris longus (34%), gracilis (10%), plantaris (4%), extensor toe (3%) and achilles (1%). The ulnar nerve transposition technique used was submuscular in 15% of procedures and subcutaneous in 32%, and 45% had diagnostic arthroscopy.

The number of participants in the included studies ranged from 12 to 100. The mean age was between 17.4 and 24.5 years, 99% were males, 83% were baseball players, 3% to 56% had previous elbow surgery and the mean follow-up was 2.5 to 6.3 years.

The authors did not state how studies were selected.

Assessment of study quality
Studies were evaluated for evidence of selection, performance, detection, and exclusion bias. The authors did not state how the validity assessment was performed.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
Data for range of motion and time to return to sport were synthesised narratively. The number of participants with complications and those with excellent Conway-Jobe ratings were summed across studies and reported as a percentage of the total sample size.
Results of the review
Eight retrospective cohort studies of 405 professional and recreational athletes were included. Study data were collected between 1974 and 2003.

Overall, 83% of patients in all studies had an excellent Conway-Jobe rating for return to competition and 10% complication rate. The most common complication was postoperative ulnar neuropathy in 6% of patients.

The muscle-splitting approach was associated with better results (87% excellent results and 6% with ulnar neuropathy) compared to detachment of the flexor-pronator mass (70% excellent results and 20% ulnar neuropathy).

Patients who did not have obligatory ulnar nerve transposition had better outcomes (89% excellent results and 4% ulnar neuropathy) compared to patients who did (75% excellent results and 9% ulnar neuropathy).

Patients treated with the docking technique (90% excellent results and 3% ulnar neuropathy) and a modified docking technique (95% excellent results and 5% ulnar neuropathy) had better outcomes compared to patients treated with a figure-of-8 technique (76% excellent results and 8% ulnar neuropathy).

Authors' conclusions
The muscle-splitting approach to the flexor-pronator mass decreased handling of the ulnar nerve and the use of the docking technique resulted in improved outcomes.

CRD commentary
The inclusion criteria and search strategy appeared to be adequate but only a single electronic database was searched, which could lead to missed studies. Also the restriction to full publications of studies could have introduced publication bias into the review. The narrative synthesis was presented well and seems appropriate given the inclusion of non-randomised studies. However, the lack of information on the method of study selection, validity assessment and data extraction, and the summation of some results across heterogeneous studies, may limit the validity of the review findings.

Implications of the review for practice and research
Practice: The authors stated that a muscle-splitting approach to the flexor-pronator mass, decreased handling of the ulnar nerve, and use of the docking technique, resulted in improved outcomes following UCL reconstruction.
Research: The authors stated that future research should continue to utilize higher levels of evidence and compare new graft fixation techniques in an attempt to further improve the ability of overhead athletes to return to sports.

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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.