Proximal row carpectomy vs four corner fusion for scapholunate (SLAC) or scaphoid nonunion advanced collapse (SNAC) wrists: a systematic review of outcomes

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CRD summary
This review comparing proximal row carpectomy (PRC) and four corner fusion (4CF) in the treatment of scapholunate or scaphoid nonunion advanced collapse wrists found both were good options. PRC may provide more motion without the 4CF-related complications. As data were of poor quality and several aspects of the review were poorly reported, these conclusions may not be reliable.

Authors' objectives
To compare the efficacy of proximal row carpectomy (PRC) and four corner fusion (4CF) in the treatment of scapholunate (SLAC) or scaphoid nonunion advanced collapse (SNAC) wrists.

Searching
MEDLINE (1966 to 2008), EMBASE (1980 to 2008), CINHAL and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for studies in any language. Search dates were not reported. Search terms were reported. References of reviews, major orthopaedic/hand textbooks and primary articles were searched for additional studies. American, British and European versions of Journal of Hand Surgery and published abstracts from European or North American Hand meetings were searched.

Study selection
Studies of patients with SNAC or SLAC wrists that were treated with PRC or 4CF and that reported on at least one of the primary outcomes (range of motion, grip strength, pain score, patient- or physician-reported outcomes and postoperative complications) were eligible for inclusion. Articles were excluded if they did not document underlying aetiology and/or minimum length of patient follow-up. Studies with less than 12 months follow-up were excluded. If diagnoses other than SLAC and SNAC were included, data from these patients were extracted if possible. Otherwise, SLAC or SNAC patients had to comprise at least 70% for inclusion of the study.

Observational studies were included (most were retrospective case series). Participant age ranged from eight to 85 years old. Most participants were male. Most patients were treated for SLAC. Average follow-up ranged from 12 to 240 months.

Two reviewers performed study selection.

Assessment of study quality
Methodological quality was assessed independently by two reviewers in terms of completeness of follow-up, blinding of assessor to surgical procedure and whether the study was prospective or retrospective. Disagreements were resolved by discussion.

Data extraction
Weighted averages were calculated for each study. For studies that reported on both techniques, risk ratios (RRs) were calculated if standard deviations were reported for continuous data or if there was an appropriate number of articles with dichotomous data. The authors did not state how data were extracted.

Methods of synthesis
For studies that reported on both techniques, risk ratios were pooled using a Mantel-Haenszel random-effects model. Statistical heterogeneity was assessed through examination of forest plots, $T^2$, $X^2$ and $I^2$ tests and funnel plots, if appropriate.

Results of the review
Fifty articles were included in the review (n unclear). Eight studies compared PRC and 4FC. The assessor was blinded in four of the eight studies.

Postoperative grip strength was similar in PRC and 4FC patients in the comparative papers (eight studies). All articles that reported preoperative and postoperative grip strength for PRC showed a postoperative improvement (nine studies). Conflicting results were found for 4CF studies (17 studies).

Most of the comparative papers reported a reduction in range of motion after surgery (number of studies unclear).

All PRC series (12 studies) and 4CF series (14 studies) showed improved subjective pain scores following surgery. Two comparative papers assessed subjective pain relief and found no significant difference between PRC and 4FC treatments.

Eighty percent of PRC patients were reported to be satisfied (nine PRC articles) compared with 90% of 4CF patients (15 4CF articles). Comparative studies found no significant difference in good subjective outcomes between PRC and 4CF (four studies).

Comparative studies found no significant difference between treatments in the number of cases that required conversion to fusion (five studies). Six comparative studies found there was a significantly higher risk of development of osteoarthritis after PRC than 4CF (RR 4.35, 95% CI 1.20 to 15.71).

No significant heterogeneity was found in the meta-analyses.

Authors' conclusions
This review confirmed that both procedures were good options for patients with symptomatic and appropriately staged SLAC or SNAC wrists. PRC may provide more motion and lacked the complications related to 4CF. Risk of subsequent osteoarthritis appeared to be higher in PRC patients.

CRD commentary
The review question was supported by inclusion criteria for patients, intervention, outcomes and study design. Studies in all languages were sought, which reduced risk of language bias. Publication bias was possible; the authors stated this was assessed, but no results of the assessment were presented. Validity assessment and study selection were preformed in duplicate, which reduced risk of error and bias; no similar steps were reported for data extraction. A limited validity assessment was performed, but no results were presented. The study designs available were generally of poor quality and few study details were presented. The reliability of data (and results of pooled analyses) was unknown. As data were poor quality and several aspects of the review were poorly reported, the authors' conclusions may not be reliable.

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

Research: The authors stated that a randomised controlled trial with long follow-up duration would be the best way to confirm differences in outcome. Long-term case series that reported the outcomes of PRC and 4CF would be beneficial. Reporting of standard deviations, confidence intervals and use of physician-reported (Mayo Wrist Score) and patient-reported (Disabilities of the Arm, Shoulder and Hand Outcome Measure) outcomes would be of use.

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Bibliographic details

PubMedID
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.