Is there evidence for early mobilization following an extraarticular hand fracture?

Feehan L M, Bassett K

CRD summary
This review assessed the effectiveness of early mobilisation on fracture healing and function after an extraarticular hand fracture. The authors concluded that there was insufficient evidence to support or refute the use of early mobilisation after an extraarticular hand fracture, and that further research is required. This was a well-conducted review and the authors' conclusions are likely to be reliable.

Authors' objectives
To assess the effectiveness of early mobilisation on fracture healing and function after an extraarticular hand fracture.

Searching
MEDLINE, EMBASE, BIOSIS Previews, SciSearch and OSHROM (for occupational medicine databases) were searched. Searches for unpublished studies were conducted using in-house databases and directories, commercial databases, web library catalogues, contact with trialists, peer-reviewed internet sites, internet search engines and handsearches of reference lists (specific sources were stated in the paper). No date or language limits were applied to the searches.

Study selection
Study designs of evaluations included in the review
Prospective controlled clinical trials, quasi-randomised and randomised controlled trials (RCTs) were eligible for inclusion. In the review, quasi-RCTs were defined as studies reported as RCTs, but with unclear or inadequate description of the method of randomisation and with inadequate concealment of treatment allocation.

Specific interventions included in the review
Studies that compared complete fracture immobilisation of both joints proximal and distal to the fracture with early mobilisation (less than 21 days) of one or both joints adjacent to the fracture were eligible for inclusion. Studies could use additional interventions only if the same interventions were used in both treatment groups. Studies in which fractures were reduced, or in which any type of hardware fracture fixation was used, were included.

All of the included studies compared traditional plaster cast immobilisation (for 2 to 4 weeks) with some form of early unrestricted active motion. The studies used different forms of external support: this varied from unrestricted motion in all joints, e.g. taping, to supports that potentially restricted movement in the affected digit but allowed full unrestricted motion of the affected digit metacarpal phalangeal joint.

Participants included in the review
Studies of participants of either sex and any age, with an open or closed extraarticular hand fracture (or fractures) in any digit, were eligible for inclusion. Participants with intraarticular metacarpal or phalangeal fractures were excluded, as were those with associated soft tissue trauma. The participants had simple closed fractures of the second to fifth digits. The mean age of the participants (reported in 4 studies) ranged from 22 to 31 years.

Outcomes assessed in the review
Studies that assessed 'healing status' or 'functional status' were eligible for inclusion. The primary outcomes were the time to union for healing outcomes, and the test score on Standardised Hand Function Test or Health-Related Quality of Life Test Instrument for function.

Studies in the review assessed fracture angulation, adverse skin reactions, mobility, grip strength and the time to return to work. The outcomes were assessed up to 6 months.
How were decisions on the relevance of primary studies made?
Two reviewers independently selected studies and resolved any disagreements by consensus.

**Assessment of study quality**
Studies were assessed using 18 items modified from published criteria (see Other Publications of Related Interest nos.1-2). The items assessed were patient selection, interventions, protocol violations, outcome evaluation and analysis. An 'overall quality assessment score' (maximum score 18) and an 'internal validity' percentage score (maximum score 11) were calculated. Studies scoring over 70% were considered to be of a high quality. Two reviewers independently assessed validity using a standardised and pre-tested form. Any disagreements were resolved by consensus.

**Data extraction**
One reviewer extracted the data using a standardised form and a second reviewer checked the accuracy.

**Methods of synthesis**
How were the studies combined?
The studies were grouped by outcome and a narrative synthesis was undertaken.

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

**Results of the review**
Six quasi-RCTs (n=459) were included.

All 6 studies were considered to be of a low quality. No studies assessed the primary review outcomes.

Three studies that assessed the change in fracture alignment or malunion found no statistically significant change from baseline fracture angulation in any treatment group. These 3 studies, which used functional fracture braces, found different results for adverse skin reactions. One study found considerably more adverse skin reactions in the early mobilisation group provided with a commercially available three-point pressure metacarpal fracture brace (17 of 65 patients versus 0 of 68 patients with an immobilisation cast). Two studies using custom-moulded braces found no pressure sores or skin necrosis in any treatment group.

All 6 studies found that early mobilisation statistically significantly improved mobility immediately after the end of the immobilisation period, compared with immobilisation, but found no difference in mobility between treatments at the final follow-up.

Three studies found that early mobilisation statistically significantly improved strength immediately after the end of the immobilisation period in comparison with immobilisation. One study found that early mobilisation statistically significantly reduced time to return to work in comparison with immobilisation.

**Authors' conclusions**
There was insufficient evidence to support or refute the use of early mobilisation after an extraarticular hand fracture. Further research is required.

**CRD commentary**
The review question was clear in terms of the study design, intervention, participants and outcomes. The search for relevant studies was extensive and attempts were made to minimise language and publication bias. Two reviewers independently selected studies and assessed validity, and methods were used to minimise bias in the data extraction.
process. Validity was formally assessed, but the criteria used were not explicitly stated. A narrative synthesis was appropriate given the small number of diverse studies. This was a well-conducted review and the authors’ conclusions are likely to 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 well-conducted RCTs are required to evaluate the efficacy and effectiveness of early mobilisation after extraarticular hand fractures.

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