**Spaans A, van Minnen L, et al. Conservative treatment of thumb base osteoarthritis: a systematic review. J Hand Surg Am. 2015 Jan;40(1);16-21.e1-6.**

PMID:25534834

Design: systematic review of randomized clinical trials (RCTs)

Purpose of study: to provide a systematic review of the effectiveness of conservative treatments for osteoarthritis of the base of the thumb

PICOS:

* Patient population: patients with trapeziometacarpal osteoarthritis
* Interventions: a wide variety of nonoperative treatments
  + Splinting
  + NSAIDs
  + Other drug treatment such as tramadol or diacerein
  + Hyaluronic acid injection
  + Corticosteroid injection
  + Prefabricated orthoses
  + Custom-made orthoses
  + Physical therapy
  + Hand therapy
* Comparison intervention: placebo, sham treatment, any of the above treatments, or different doses of the above treatments
* Outcomes:
  + Pain
  + Pinch grip
  + Grip strength
  + Hand function assessed by questionnaires
* Study types: RCTs, reviews or meta-analyses of RCTs

Study selection:

* Databases were PubMed and EMBASE through May 2014, with checking of reference lists
* No efforts appear to have been made to assess studies in terms of quality or risk of bias
* However, main outcomes are summarized descriptively, making it possible to determine which studies included outcomes which are relevant to hand function as opposed to studies with surrogate or symptom only outcomes

Relevant results and reasons not to cite as evidence:

* For hand therapy, the authors selected six studies, all by the same first author, which compared four different types of physical therapy with similar control groups, in which the control group received ultrasound at nontherapeutic doses
  + Most of these studies did not report effects of hand therapy on function; some found effects on pain pressure threshold but not on pinch or grip strength
  + Only one study (Villafane 2012) reported a therapeutic effect on function, finding that radial nerve mobilization decreased pain sensitivity and increased tip pinch strength, but this study would not meet the requirements for an evidence statement in the guideline
    - The study randomized patients to either six sessions of radial nerve mobilization by a hand physical therapist or to six sessions of subtherapeutic ultrasound, with the sessions being spaced at least 48 hours apart
    - The statistical analysis, using two-way analysis of variance (ANOVA), was sound, but the results were described only in terms of p values for the F statistic from the ANOVA, and not in terms of effect sizes whose clinical importance could be determined
    - The graphical representation of the treatment effects showed that there was a small separation of the treatment and control groups with respect to pinch strength (between thumb and index finger) at the end of treatment, but there was no significant separation between groups at followup done one and two months after the end of treatment
    - There was no difference between the treatment and control groups with respect to tripod strength (thumb, index finger, middle finger) either at the end of treatment or during followup
    - The mean age of the study subjects was 81 (ranged from 70 to 90 years), meaning that return to work is not a treatment goal
    - There was a transient treatment effect on pressure pain sensitivity at the end of treatment, but this did not persist at the one or two month followup periods
    - Therefore, the study shows an absence of evidence of a beneficial effect of radial nerve mobilization on function and pain sensitivity
* For intra-articular injections, the authors selected seven RCTs
  + For each study, the findings are reported in terms of the authors’ conclusions, without attempting to evaluate the validity of the conclusions
  + The authors report that most studies found hyaluronate to be effective, but the supportive studies cited (Figen Ayhan, Fuchs, Stahl, Heyworth) were of low quality and were at risk of bias
    - Figen Ayhan did not designate a primary outcome, and the most appropriate outcome was not reported
    - Fuchs did not report its method of randomization, and appeared to analyze the outcome data with a deliberate effort to make hyaluronate injection superior to triamcinolone (reporting a group difference in lateral pinch strength showing a “slight superiority” of hyaluronate even though the p value was 0.1966)
    - Heyworth did suggest hyaluronate injections, but they actually did not conclude that it was superior to steroid or saline injections
    - Stahl reported functional benefit of hyaluronate, but the methods section was sketchy and examination of the group differences between hyaluronate and methylprednisolone showed the differences to be almost negligible
    - Thus, the studies included in this review add up to an absence of evidence of the effectiveness of hyaluronate for thumb OA
  + Meenagh did not use hyaluronate, but compared intra-articular steroid with placebo; it was satisfactory in terms of design and execution, but was underpowered due to falling short of the goals for recruitment of patients into the trial; no difference was found between triamcinolone and placebo, but was not evidence of their equivalence due to the inadequate sample size
* For orthoses, the authors found ten RCTs
  + Two studies compared orthoses with control groups who did not receive orthoses, and while both studies found that splints reduced pain, neither study found that the use of an orthosis changed functional capacity
  + Two studies compared prefabricated with custom-made orthoses, and both studies concluded that both orthoses had therapeutic effects
    - Functional outcomes were the same with the two splint types
    - The custom-made orthoses gave more pain reduction in both studies
    - However, the prefabricated splint was preferred by more patients than the custom splint
  + Other studies were examined, and included comparisons of short and long splint designs, flexible or semirigid orthoses, thumb strap orthoses or short opponens orthoses, and prefabricated soft orthoses versus hand exercises only
    - These studies had small sample sizes and did not yield any robust conclusions that would support any particular splint type or design
  + An additional study (Berggren et al 2001) provided 33 patients who were on waiting lists for thumb surgery with technical accessories which consisted of devices provided by occupational therapists: bread saw, scissors, pen handle, cheese cutter, etc
    - The same study randomized patients to no splint (n=11), semistable textile splint (n=11), and leather splint (n=11), and did not find that the splints made a difference
    - However, the important finding from this study was that after 7 months, 70% of the patients who had been provided with technical accessories opted out of going ahead with the scheduled surgery
    - The authors concluded that in patients with isolated carpometacarpal thumb osteoarthritis and no contracture, a trial of technical accessories may allow the patient to avoid surgery
* Two other trials of conservative interventions were found
  + One small trial found no effect of transdermal steroid delivery by iontophoresis or phonophoresis compared to placebo
  + Another unblinded trial compared leech therapy with topical diclofenac, and found that the leech therapy group experienced less pain and better DASH scores; the lack of blinding and the small sample sizes prevented the authors from drawing any conclusions about the effectiveness of leech therapy

Final comments:

* Because the authors made no organized effort to assess study quality or to estimate the risk of bias in the included studies, no evidence statements can be based on their findings, and the overall quality of the review is low
* However, the review is valuable in showing that there is an absence of evidence for the effectiveness of conservative interventions such as hand therapy and hyaluronate injection
* There is an absence of evidence which would favor any one orthotic design over any other
  + An important conclusion arrived at by the authors of one study (Sillem et al 2011) should have been mentioned in the review: both prefabricated and custom-made splints demonstrated modest improvements in hand function, the prefabricated splint was preferred by patients, but the custom splint reduced pain slightly more***: this reinforces the client-centered approach to splinting***
* The Berggren 2001 study contributes valuable information to the consideration of conservative therapy for thumb OA: occupational therapists can provide specially fitted accessories such as bread saws, grabber sticks, potato peelers, pen handles, and book supports, and patients who use these accessories for several months may decide that they do not require surgery even though they were on waiting lists for an operation

References:

Berggren M, Joost-Davidsson AJ, et al. Reduction in the Need for Operation After Conservative Treatment of Osteoarthritis of the First Carpometacarpal [CMC] Joint: A Seven Year Prospective Study. Scand J Plast Reconstr Hand Surg 2001; 35:415-417.

Sillem H, Backman C, et al. Comparison of two carpometacarpal stabilizing splints for individuals with thumb osteoarthritis. J Hand Ther. 2011;24(3);216-25.