

# Conservative Treatment of Thumb Base Osteoarthritis: A Systematic Review

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**Purpose** To provide a systematic review of randomized controlled trials regarding the conservative treatment of thumb base osteoarthritis (OA).

**Methods** A systematic literature search was conducted in the electronic bibliographic databases Medline (Pubmed) and Embase (both starting year to May 2014) using predetermined criteria for studies on nonoperative treatment of thumb base OA.

**Results** Twenty-three articles fulfilled our inclusion criteria. Systematic evaluation demonstrated the following: (1) Hand therapy can possibly reduce pain. However, owing to the lack of good-quality (randomized controlled) trials with sufficient follow-up time, no proper conclusions can be drawn. (2) Although both steroid and hyaluronate intra-articular injections can provide pain relief, most authors conclude that injection of hyaluronate is more effective. Follow-up is rather short with a maximum of 12 months in 1 study. Furthermore, study comparison is hampered by heterogeneity of study design and outcome parameters. (3) The use of orthoses reduces pain without effect on function, strength, or dexterity. Included studies used various types of orthoses. Follow-up times varied (2 wk–7 y). (4) There is no justification for the use of transdermal steroid delivery. (5) There is insufficient evidence justifying the use of leech therapy. (6) There are no high-level evidence studies specifically evaluating the effect of analgesics and patient education in joint protection in patients with thumb base OA.

**Conclusions** There are only a few high-quality studies addressing the conservative treatment of trapeziometacarpal OA. Available evidence suggests only some effect of orthoses and intra-articular hyaluronate or steroid injections. (*J Hand Surg Am. 2015;40(1):16–21. Copyright © 2015 by the American Society for Surgery of the Hand. All rights reserved.*)

**Type of study/level of evidence** Therapeutic II.

**Key words** Carpometacarpal, conservative, osteoarthritis, systematic review, trapeziometacarpal.



**O**STEARTHROSIS (OA) OF THE BASE of the thumb is a disabling disease, which affects up to 36% of postmenopausal women.<sup>1,2</sup> It has substantial effects on stability of the trapeziometacarpal

(TMC) joint, causes pain, and reduces the capacity to perform daily activities.<sup>3</sup>

Thus far, there is no curative treatment for thumb base OA. Over the past decades, several surgical procedures

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for thumb base OA have been advocated. Although no procedure has been proven superior, surgical intervention can be effective.<sup>4</sup> However, operative interventions are more prone to complications, and therefore, conservative options should be considered first. It is unclear which conservative measures, if any, are most effective.

The aim of conservative treatment is to restore thumb functionality, including pain relief, stability, mobility, and strength. Commonly used conservative measures are injections (cortisone, hyaluronate), analgesics, patient education in joint protection, strengthening exercises, assistive devices, and orthosis.<sup>5,6</sup>

Only a few review papers on conservative treatment of thumb base OA have been published. Egan and Brousseau<sup>6</sup> concluded that patients should be given the opportunity to try an orthosis, despite little evidence to support the use of orthoses in thumb base OA for pain relief. Mejjad and Maheu<sup>7</sup> and Mahendra and Towheed<sup>8</sup> reviewed nonsurgical therapies for OA of the hand, but these studies were not limited to treatment of the base of the thumb.

The aim of the present systematic review was to provide an overview of the efficacy of available conservative treatment methods for symptomatic thumb base OA, to provide treatment recommendations, and to give suggestions for future studies.

## MATERIALS AND METHODS

We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. A systematic literature search in the electronic bibliographic databases Medline (Pubmed) and Embase was performed up to May 2014 using the following key words: basal, first, carpometacarpal, CMC, trapeziometacarpal, TMC, thumb, osteoarthritis, rhizarthritis, arthritic, nonsurgical, symptomatic, conservative, splint, splinting, NSAID, analgesics, drug, pain, medication, hylan, hyaluronic, hyaluronidate, corticosteroid, steroid, orthosis, orthoses, exercise, physiotherapeutic, physiotherapy, hand therapy, occupational therapy, physical therapy, viscosupplementation, injection, tramadol, ibuprofen, acetaminophen, and diacerein.

Combined searches were conducted to identify relevant studies. Furthermore, references were checked for identification of additional relevant articles.

Subsequently, the title and abstract of all records were screened. Studies were included if the following criteria were fulfilled:

- Primary study written in English
- Conservative treatment of thumb base OA
- Randomized controlled trial (RCT), review or meta-analysis of RCTs

## RESULTS

Initially, 1,951 articles were retrieved (1,141 in Embase and 810 in Medline). After screening of title and abstract, 35 studies were selected. Eleven studies were excluded after reading the full text or because no full text was available (only abstract for presentation). One additional study was identified by checking references.

### Study inclusion

Application of the inclusion criteria resulted in 25 included RCTs. These studies described the effects of hand therapy, intra-articular injections with hyaluronate or steroid, various orthoses, transdermal steroid delivery, and leech therapy.

The great degree of heterogeneity of the included studies in terms of population, intervention, and outcome did not allow for statistical pooling. Therefore, conclusions were drawn based on the main findings only.

### Hand therapy

The effect of hand therapy has been studied in 6 RCTs (Appendix A, available on the *Journal's* Web site at [www.jhandsurg.org](http://www.jhandsurg.org)). Four different types of physical therapy were compared with similar control groups in which patients were treated with ultrasound at nontherapeutic doses.

Restoration of the glide component of joint movement to facilitate a full pain-free range of movement (Kaltenborn manual therapy) significantly decreased pain without increase in motor function in 1 study.<sup>9</sup> The authors concluded that joint mobilization may be effective in reducing pain.<sup>9</sup> A second RCT cautiously concluded that pressure pain threshold increased significantly after passive mobilization, without increase in motor function.<sup>10</sup> Secondary analysis also found limited hypoalgesic effects over the contralateral TMC joint.<sup>11</sup>

Hypoalgesia and increased pinch strength resulted from mobilization of the superficial cutaneous branch of the radial nerve.<sup>12</sup> The same authors also found reduced pain in the contralateral limb, suggesting a hypothetical bilateral hypoalgesic effect of the intervention.<sup>13</sup>

In the last RCT patients received multimodal manual treatment consisting of Kaltenborn joint mobilization, neurodynamic techniques, and an exercise protocol.<sup>14</sup> There was a significant reduction in pain intensity, without differences in strength or pressure pain thresholds. The authors concluded that a multimodal treatment approach is more beneficial in treating pain than a placebo intervention.

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