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BRIEF REPORT

The pain associated with intraarticular hyaluronic acid injections for trapeziometacarpal osteoarthritis

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Abstract Trapeziometacarpal osteoarthritis predominantly affects middle-aged women. Most cases with rhizarthrosis can be managed successfully by conservative means. The purpose of this prospective study was to evaluate pain and tolerability of viscosupplementation therapy with hyaluronic acid (HA) for trapeziometacarpal osteoarthritis. Groups A and B consisted of eight patients each with Eaton stage 3 or 4 rhizarthrosis, who underwent one cycle of three injections of (one per week) 0.3 cm^3 sodium hyaluronate. The injections for group A were under fluoroscopy control, but fluoroscopy was not used in group B. Pain and tolerability of both groups A and B were measured and compared. The patients of the groups were also asked to evaluate the tolerability of the treatment. The results suggested that HA injection in the carpometacarpal joint is a tolerable procedure but the patients complained of pain and discomfort during the injections. The pain in group A was much greater than in group B. Viscosupplementation for the treatment of trapeziometacarpal osteoarthritis is a viable treatment option for stages 3 and 4 patients when they do not want to be operated on. It is a tolerable but not a painless procedure especially when it is done without fluoroscopy control. We recommend giving injections under fluoroscopy control.

Keywords Hyaluronic acid · Intraarticular injection · Trapeziometacarpal osteoarthritis

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Introduction

Trapeziometacarpal osteoarthritis predominantly affects middle-aged women and is often bilateral [1]. In some patients, the evolution of osteoarthritis is painless but others have considerable functional disability-restricted mobility, impaired thumb function, and pain [2]. If the condition is not treated, a severe adduction contraction of the thumb and subluxation of the carpometacarpal (CMC) joint can develop [3].

Most cases with trapeziometacarpal osteoarthritis can be managed successfully by conservative means. Surgery is indicated in resistant cases but the best choice of surgical treatment is still debatable [4–11].

Hyaluronic acid (HA) is a macromolecular component in normal synovial fluid [12]. In osteoarthritis, there is a lower concentration of HA in synovial fluid; for this reason, researchers recommend using intraarticular HA for the treatment of osteoarthritis of several joints. Although HA is most commonly used in osteoarthritis of the knee, it has also been used in the treatment of symptoms associated with osteoarthritis of the hip, temporomandibular, and CMC joints [13–16].

There are few studies in the literature which evaluate the effectiveness and tolerability of HA administration for the treatment of trapeziometacarpal osteoarthritis [14]. Further decrease in the volume of the already narrow joint space

because of osteoarthritis makes the technique even more difficult, painful, and leads to multiple trials.

The purpose of this study was to evaluate the tolerability of viscosupplementation in patients with trapeziometacarpal osteoarthritis and to compare the pain of injections given with and without fluoroscopy control.

Materials and methods

The study was approved by the local ethical committee. Sixteen patients with radiographic osteoarthritis and pain in the first CMC joints agreed to participate in the study. Exclusion criteria were as follows: psychotic disorders, mental retardation, infection or any skin conditions at the injection site, non-osteoarthritic joint disease (rheumatoid arthritis and infection), malignant disease, use of anti-coagulants, and patients with known allergy to administered agents.

Groups A and B consisted of eight patients each with Eaton stage 3 or 4 osteoarthritic changes. The patients in both groups A and B underwent one cycle of three injections (one per week) of 0.3 cm^3 sodium hyaluronate (Ostenil, TRB Chemedica, Munich, Germany) with an insulin syringe needle (Medset, Anhui Tiankang Medical Products, China) inserted in the original syringe by one investigator (NK). Injections for Group A was administered under fluoroscopy control, but fluoroscopy was not used for group B. The mean ages of the patients in groups A and B were 52 (48–58) and 57 (48–63), respectively.

Pain during the injection was assessed using 10 mm visual analogue scale (VAS), with 0 representing no pain and 10 representing the worst imaginable pain. The patients of both groups were also asked to evaluate the tolerability of the treatment (0, poor; 1, slight; 2, moderate; 3, good; 4, excellent).

The follow-up time was 1 month from the first injection.

Statistical comparison of the groups was performed with the Mann–Whitney U test. Significance was set at $p<0.005$.

Results

There were no complications with the sodium hyaluronate intraarticular injections. All the patients in groups A and B complained of pain and discomfort during the injections. The mean VAS scores of the pain in groups A and B were 4.1 (range 3–6) and 5.6 (range 3–7), respectively. The difference of the VAS scores between the three groups was statistically significant ($p<0.005$). The mean score of the tolerability of the injection in groups A and B was 2.5 (moderate–good) (range 1–3).

Discussion

Intraarticular HA and steroid injection for the treatment of osteoarthritis of first CMC joint is an effective procedure [14, 17]. Clinical symptoms such as pain, lack of function, and loss of motion range improve with this therapy. Similar findings were observed in the treatment of osteoarthritis of the knee, hip, and temporomandibular joints [13–16].

The disadvantages of HA treatment are the necessity of multiple intraarticular injections, the risk of iatrogenic infection, and the deterioration of the positive effect by time [14, 18]. Also, it is not clear how much chemical is enough and injection under fluoroscopy control to decrease pain due to the injection.

During our clinical applications, we observed that the intraarticular injections into the CMC joint is a painful procedure especially if it is done without fluoroscopy control. The reason may be para-articular injection or periosteal irritation. In this study, injection pain in group A was more than in group B, and this data supported our clinical experience. Intraarticular HA and corticoid injection for the treatment of osteoarthritis of the first CMC joint was reported to be tolerable both under or without fluoroscopy control, but to the best of our knowledge, the pain related to injection to the CMC joint using these two techniques was not studied before.

The amount of the chemical injected to CMC joint varies from 0.25 to 1 cm^3 [14, 17, 18]. We observed that the pain increase with the total volume. Although researchers reported that injection of 1 cm^3 to the CMC joint is tolerable, we preferred to inject 0.3 cm^3 because we wanted to eliminate the effect of volume on the pain induced by injection. Unfortunately, it was not possible for us to compare the pain produced with different amounts of the chemicals. Further studies are needed to clarify the role of the volume injected with regard to pain.

Viscosupplementation for the treatment of trapeziometacarpal osteoarthritis is considered to be a viable treatment option in Eaton stages 3 and 4 rhizarthrosis patients when they do not want to be operated on. It is a tolerable but not a painless procedure. We recommend injection under fluoroscopy control.

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