Treatment of Hip Trochanteric Bursitis Using Hyaluronate Injections

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ABSTRACT

Trochanteric bursitis is a common cause of musculoskeletal pain and often requires medical intervention and should be distinguished from sciatica and irradiating pain of pelvic and spinal origin. Previously, the etiology of the trochanteric pain syndrome was thought to be caused by inflammation. The current study was performed in order to assess the efficacy of trochanteric injections.

Methods: 158 patients were treated for trochanteric bursitis (132 females/26 males, range 22 - 88 years). 59b were treated with corticosteroid injection, 60 with hyaluronate and 39 were injected using a combination of both. Patients were followed by the HOOS score for a minimum of 12 months.

Results: Pre-operative HOOS scores were similar in all groups. Following injection, the HOOS score increased from 27 ± 4 to 66 ± 2 after six months and 77 ± 4 after a year. At 12-month follow-up, the average score of patients treated by corticosteroids injection was 44 ± 7 compared with 62 ± 8 for the hyaluronate injected group and 64 ± 6 for the combination injection group.

Discussion: It appears that injection therapy is highly efficacious for treating trochanteric bursitis. The effect of hyaluronate or hyaluronate and steroid combination appears to be longer lasting than that of steroid alone.

Keywords: Hip; Trochanteric Bursitis; Hyaluronic Acid; Bursitis

1. Introduction

Bursitis is a common cause of musculoskeletal pain and often requires medical intervention. It should be distinguished from arthritis, fracture, tendinitis, and nerve pathology. Trochanteric bursitis is common and should be distinguished from sciatica and irradiating pain of pelvic and spinal origin. Most patients respond to nonsurgical management, including ice, activity modification, and nonsteroidal anti-inflammatory drugs.

The etiology of this syndrome is not completely clear, previously, the etiology of the trochanteric pain syndrome was thought to be caused by inflammation of the subgluteus maximus bursa (i.e., bursitis). Recently, MRI and ultrasound studies have brought into serious doubt the idea that bursitis is the etiology for trochanteric pain. Indeed, a histological evaluation has shown that the tissues are composed of primarily fibro-adipose tissue with no signs of acute or chronic inflammation [1]. Other authors have found an association between increase in trochanteric width compared with the iliac wing width and trochanteric bursitis [2]. Injection therapy is considered quite efficient with over 60 percent pain alleviation [3]; however, relapse is fairly common. There are inherent dangers to injection steroids anywhere in the body [4], but in the vicinity of tendons the risk is aggravated by the possibility of tendon tears. An alternative injectable medication is hyaluronate. There is a growing body of evidence supporting the use of hyaluronan (HA) in patients with adhesive capsulitis of the shoulder, although the mechanisms of the effect have not yet been clarified. It has been shown that in adhesive capsulitis of the shoulder, histological findings consistently demonstrated chronic non-specific inflammation with synovial hyperplasia, proliferation of vessels and fibroblasts, and increased amount

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of extracellular matrix [5]. Hyaluronate significantly and
dose-dependently inhibited cell proliferation and de-
creased the expression levels of mRNA for adhesion-re-
lated procollagens and cytokines. It is thus possible that a
similar therapeutic effect be achieved using hyaluronate
injections in the trochanteric bursa. The use of hyaluro-
nate injections has been routine in our practice for the
last 15 years. The following study is a retrospective eva-
luation of a consecutive series of patients treated with
hyaluronate and compared with corticosteroids injection
and combination therapy.

2. Methods

2.1. Patients

This is a retrospective evaluation of a consecutive series
consisting of 158 patients that were treated for trochan-
teric bursitis [TB] (132 females/26 males). The average
age was 63 years (range 22 - 88 years). Fifty nine of the
patients were treated with corticosteroid injection (beta-
methasone dipropionate 5 milligrams and betamethasone
sodium phosphate 2 milligrams). Sixty of the patients were
treated with hyaluronate (Ostenil, TRB Chemedica Inter-
national S.A., 1211 Geneva, Switzerland). Thirty-nine of
the patients were injected using a combination of hyalu-
ronate and steroids (as described above).

2.2. Trochanteric Bursitis Diagnosis

The diagnosis was made as suggested by Brinks and co-
workers [6]: “TB was diagnosed when the patient com-
plained of pain persisting for more than 1 week in the la-
teral region of the hip, and tenderness to palpation of the
greater trochanter, reproducing the patient’s pain, was
found on physical examination”. All patients underwent at
least one month of conservative treatment consisting of
twice weekly standard physiotherapy regimen of physical
strengthening of the gluteus medius and electrotherapy of
the affected region. Treatment with non-steroidal anti-in-
flammatory agents was given to some of the patients as
per family decision.

2.3. Inclusion Criteria to Be Reported in This
Series

1) Diagnosis of TB as described above;
2) Failure of one month of conservative therapy;
3) Oral agreement to injection therapy.

2.4. Exclusion Criteria from This Series

1) Patients who were unable to understand the ques-
   tionnaires;
2) Patients who had consulted their general practitio-
   ner with the same symptoms in the previous year and had
   received any intervention except the conservative therapy
described above;
3) Patients who were operated on in the same region, or
   who had a systemic neurological or rheumatologic dis-
   order;
4) Patients suffering from chronic low back pain or
   sciatica as per medical records;
5) Diabetes mellitus.

2.5. Choice of Therapy

Patients were offered a choice between injections of ei-
ther medication. Due to pricing considerations the pa-
tient’s decision was based on financial ability and prefer-
ences as anxiety from steroid injections and their com-
lications is rather prevalent.

2.6. Treatment Effect Assessment

Patients were assessed using a back-translated HOOS
(www.koos.nu/HOOSEng.pdf) version (Hebrew and Arab-
ic). The questionnaires were self-filled by the patients,
and a research assistant verified questionnaire filling. In
addition a standardized VAS score was filled out in an-
swer to the question: “What number would you give your
pain right now?” (the scale employed is not horizontal
but vertical [7] and thus eliminates bias stemming from
writing directionality in our patient population).

2.7. Statistical Analysis

Statistical analysis was performed using the SPSS statis-
tical program. ANOVA with post-hoc analysis was used.
Between-group differences in the primary outcome were
analyzed based on the intention-to-treat principle. Be-
tween-group differences in continuous outcome measures
were analyzed with repeated measures for general linear
models. A difference at the 0.05 level is termed signifi-
cant.

Effect sizes were calculated as adjusted difference in
outcome divided by baseline standard deviation of the
outcome. From the clinical standpoint effect sizes of 0.2
to 0.5 are considered small, and 0.5 to 0.8 moderate, whe-
reas greater than 0.8 indicates a large clinical effect [8].

3. Results

3.1. HOOS Score

The HOOS score was evaluated for the entire cohort. The
HOOS score increased from 27 ± 4 to 66 ± 2 after six
months and 77 ± 4 after a year (Figure 1). The pre-in-
jection average score was similar in the three groups. A
significant difference was found between the groups (Fi-
gure 2, ANOVA, p < 0.05), the average score of patients
-treated by corticosteroids injection was 44 ± 7 as com-
pared with 62 ± 8 for the hyaluronate injected group and
64 ± 6 for the combination injection group. There was a
time interaction with inter-group difference with time. In the corticosteroid group the average score significantly improved from $26 \pm 4$ to $52 \pm 7$ at six months but did not improve further at 12 months ($53 \pm 6$). The time-related behaviour was different in the hyaluronate group with a pre-injection average of $27 \pm 3$ increasing to $74 \pm 5$ at six months, and to $90 \pm 9$ at 12 months. The combination therapy group had a similar time-related behavior to the hyaluronate group (Table 1). Effect size was 0.9 for the hyaluronate and combination therapy groups and 0.5 for the corticosteroids group.

### 3.2. VAS Scale

VAS scale declined over time for the entire cohort from $10$ to $2.4$ after a year. There was a significant inter-group difference of the VAS scores with average VAS of the corticosteroids treated group higher ($5.5 \pm 1$) than the hyaluronate group ($4.1 \pm 1$) and the combination therapy group ($4 \pm 1.5$). There is a time-dependent intergroup difference with a steep decline from pre-injection to the six weeks mark and a significant increase at later time points of 3 months and six months. The scale at twelve months is similar to that at six months (Table 2). The time dependence in the hyaluronate and the combination therapy groups is different with a continuing significant

![Figure 1. Improvement in HOOS score over the course of one year is significant for the entire cohort, indicating the limited lifespan of TB complaints.](image)

![Figure 2. Integrated average HOOS score during one year follow-up in various groups. Average score of different treatment groups integrating all time-points. The integrative statistic allows appreciation of the treatment effect over time compared with a high pre-injection average of $10 \pm 1$.](image)

<table>
<thead>
<tr>
<th>Time after Injection</th>
<th>Entire Cohort</th>
<th>Corticosteroid</th>
<th>Hyaluronate</th>
<th>Combination Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Injection</td>
<td>$27 \pm 4$</td>
<td>$26 \pm 4$</td>
<td>$27 \pm 3$</td>
<td>$27 \pm 4$</td>
</tr>
<tr>
<td>6 Months</td>
<td>$66 \pm 2$</td>
<td>$52 \pm 7$</td>
<td>$74 \pm 5$</td>
<td>$71 \pm 7$</td>
</tr>
<tr>
<td>12 Months</td>
<td>$77 \pm 4$</td>
<td>$53 \pm 6$</td>
<td>$90 \pm 9$</td>
<td>$88 \pm 4$</td>
</tr>
</tbody>
</table>

*SD = Standard Deviation.

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</tr>
</thead>
<tbody>
<tr>
<td>Pre-Injection</td>
<td>$10 \pm 1$</td>
<td>$10 \pm 1$</td>
<td>$10 \pm 1$</td>
<td>$10 \pm 1$</td>
</tr>
<tr>
<td>6 Weeks</td>
<td>$3.3 \pm 2$</td>
<td>$3.9 \pm 1.5$</td>
<td>$3.7 \pm 1$</td>
<td>$2.5 \pm 1.5$</td>
</tr>
<tr>
<td>3 Months</td>
<td>$3.5 \pm 2$</td>
<td>$4.3 \pm 2$</td>
<td>$3.2 \pm 1$</td>
<td>$3.1 \pm 1$</td>
</tr>
<tr>
<td>6 Months</td>
<td>$3.5 \pm 1.5$</td>
<td>$4.7 \pm 2$</td>
<td>$2.8 \pm 1.5$</td>
<td>$3 \pm 1$</td>
</tr>
<tr>
<td>12 Months</td>
<td>$2.4 \pm 1$</td>
<td>$4.8 \pm 1$</td>
<td>$1 \pm 1$</td>
<td>$1.5 \pm 1$</td>
</tr>
</tbody>
</table>

*SD = Standard Deviation.
4. Discussion

The current study appears to demonstrate that there is an ameliorative effect of steroid and hyaluronate injections in trochanteric bursitis. The pain relief appears to be significant with large effect size for both the hyaluronate and combination therapy groups. The effect of steroids appears to be short lived and this observation concurs with the finding comparing effects of steroids and hyaluronate in knee osteoarthritis [9]. The basic pathology underlying the symptoms is not fully known. However, inflammation does not appear to be involved in the basic pathological mechanism as histology and MRI do not indicate obvious signs of inflammation. The rationale for hyaluronate injection rests with its known anti-inflammatory effects as well as the possibility that its presence will restore normal tissue function. Indeed, previous studies have indicated that hyaluronate injections in the knee serve to ameliorate knee function and increase muscle strength by an unknown mechanism that does not occur with steroid injections [10,11]. It should be remembered that steroid injection particularly in diabetics is likely to raise glucose levels [12]. As a large proportion of the population is diabetic, this consideration limits the applicability of injection therapy in a significant proportion of patients.

The possible mechanism of action of hyaluronate in trochanteric bursitis appears to be complicated. The disorder is apparently non-inflammatory. However, it is known that hyaluronate plays a significant role during development, wound healing and regeneration. It enhances muscle progenitor cell recruitment and inhibits premature myotube fusion, implicating a role for this molecule in enhancing muscle progenitor cell recruitment and inhibiting development, wound healing and regeneration. It is well known that hyaluronate plays a significant role during development, wound healing and regeneration. It is well known that hyaluronate plays a significant role during development, wound healing and regeneration.

The current study appears to indicate that hyaluronate injection is an acceptable alternative to steroid injections for the treatment of trochanteric bursitis. The effect size is larger with hyaluronate injections, and lasts longer. Limitations of the current study include its design being retrospective, and thus the groups were not randomized. A further prospective randomized clinical trial should be done prior to making a clear cut recommendation that hyaluronate injections are superior to steroid injections in the treatment of this syndrome.

REFERENCES
