



Original Article

## Comparison of the efficacy of physical therapy and corticosteroid injection in the treatment of pes anserine tendino-bursitis

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**Abstract.** [Purpose] The aims of this study were twofold. The first was to compare the functional capacity and pain of patients with knee osteoarthritis (KOA), with or without pes anserine tendino-bursitis (PATB). The second is to compare the efficacy of two treatment methods (physical therapy and corticosteroid injection) for patients with PATB. [Subjects and Methods] Sixty patient with KOA and PATB (Group 1) and 57 patients with KOA but without PATB (Group 2) were enrolled in the study. The patients' visual analog scale (VAS), Western Ontario and McMaster Universities osteoarthritis index (WOMAC) scores and three-meter timed-up and go scores were measured. The PATB group was randomly divided into two groups (Group A and B). Physical therapy (PT) modalities were applied to the first group (Group A), and the second group (Group B) received corticosteroid injections to the pes anserine area. Eight weeks later, patients' parameters were measured again. [Results] Initial WOMAC scores and timed up-and-go times were significantly higher in Group 1 than in Group 2. Both treatments resulted in significant improvements in all measured parameters, but no significant difference was detected between Group A and B. [Conclusion] Patients with PATB tend to have more severe pain, more altered functionality, and greater disability than those with KOA but without PATB. Both corticosteroid injection and PT are effective methods of treatment for PATB. Injection therapy can be considered an effective, inexpensive and fast therapeutic method.

**Key words:** Pes anserine tendino-bursitis, Corticosteroid injection, Physical therapy

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### INTRODUCTION

The sartorius, semitendinosus and gracilis muscles along the proximal aspect of the tibia are called the pes anserine<sup>1)</sup>. The bursa lies under the pes anserine. Inflammation of the bursa was first described 70 years ago<sup>2)</sup>. It is one of the most frequent soft tissue pain syndromes that affect the knee<sup>3)</sup>. Chronic bursitis is common in patients with rheumatoid arthritis or degenerative joint disease. In one study, the incidence was found to be 2.5% in symptomatic knees<sup>2)</sup>. It is more common in females, obese and type 2 diabetes patients<sup>4, 5)</sup>. Its etiology and pathogenesis are not clear<sup>6)</sup>.

Pes anserine tendino-bursitis (PATB) is one of the causes of pain in knee osteoarthritis (KOA). Classic symptoms are

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tenderness and swelling over the medial proximal tibia or medial knee pain mimicking medial meniscus/medial collateral ligament injury<sup>1</sup>). Repetitive trauma and excessive valgus or rotator stress on the knee or a direct contusion can cause bursitis and tendinitis due to friction on the bursa<sup>7</sup>).

The diagnosis of PATB is based on clinical presentation. Pain can be exacerbated by going up and downstairs. Patients may have pain while getting up from a sitting position or at night. Chronic refractory pain increases during activity. Patients typically complain of pain when walking on flat surfaces<sup>8</sup>). The most important physical examination finding is tenderness upon palpation of the proximal medial tibia, approximately 2–3 cm below the anteromedial joint. External rotation of the tibia and active rotation against resistance are painful<sup>2</sup>).

Rest, administration of non-steroidal anti-inflammatory drugs, the application of physical therapy (PT) modalities, intra-bursal local anesthetic and/or corticosteroid injections are the treatment options<sup>8</sup>).

The primary objective of this study was to determine whether the presence of PATB is associated with greater impairment, and disability in KOA. A second objective was to compare the effectiveness of two distinct therapeutic approaches to treating KOA patients with PATB. We hypothesized that local corticosteroid injections into the pes anserine area may have as favorable an outcome as PT, and that the quick response to corticosteroid injections may make this option more preferable.

## SUBJECTS AND METHODS

This study was approved by the Ethical Committee of Ethics Committee of Baskent University (KA05/235). All patients were provided with a written explanation of the study and all gave their written informed consent.

The inclusion criteria for the patients were 2nd or 3rd radiological grade of knee osteoarthritis according to the Kellgren-Lawrence scale and provision of a signed informed consent. Patients with any knee surgery history, a history of inflammatory arthritis, or trauma to the knee, or who received PT or injection to the knee during the last year were excluded from the study.

A total of 176 patients, who attended the outpatient clinic complaining of knee pain and who were diagnosed with KOA according to American College of Rheumatology (ACR) diagnostic criteria, were screened. Of these patients, 82 had pes anserine tendino-bursitis (PATB+) and 94 did not (PATB–). After the exclusion criteria had been applied, 60 of the 82 PATB+ patients formed Group 1 and 57 of the 94 PATB–patients formed Group 2 (the control group). Total blood count, erythrocyte sedimentation rate, C-reactive protein, rheumatoid factor, uric acid levels and fasting blood glucose were measured.

Functional capability and the severity of knee pain of all patients were evaluated using a visual analogue scale (VAS), culturally adapted and validated Turkish version of the Western Ontario and McMaster Universities osteoarthritis index (WOMAC)<sup>9</sup>, and the three-meter timed up-and-go test. The PATB group was randomly divided into two subgroups. The treatment method for the patients was determined by assigning them a random number (one or two) according to their appointment dates to make sure the treatment groups were equal in size. The first group (Group A) received treatment consisting of a hot-pack (20 min) + ultrasound (1.5 W/cm<sup>2</sup>, 5 min) + conventional transcutaneous electrical nerve stimulation (TENS 20 min) to the pes anserine region for two weeks. The second group (Group B) received treatment consisting of corticosteroid (40 mg triamcinolone acetonide) injection to the tenderest point of the pes anserine region using an infiltration technique. The same physician performed all injections. The measurements of VAS, WOMAC and the three-meter timed up-and-go test were repeated eight weeks later. All measurements (before and after therapy) were taken by another physician who was blinded to the treatment modalities.

There were no complications in either of the two treatment groups. The patients were told not to use any analgesic drugs during the treatment period.

Analysis was performed using SPSS for Windows 11.5 software. Normal distribution of continuous variables was assessed by using the Shapiro-Wilk test, and data were expressed as mean ± standard deviation or as medians and 95% central range, as appropriate. The differences between groups were assessed using the unpaired t-test for parametric data and the Mann-Whitney U-test for non-parametric data. Dependent variables were assessed using the paired t-test for parametric data and the Wilcoxon test for non-parametric data. P values of less than 0.05 were considered statistically significant.

## RESULTS

The demographic data of the patients is summarized in [Table 1](#).

Initial VAS scores were higher in Group 2, but the difference from Group 1 was not statistically different. WOMAC scores and timed-up and go test times were significantly higher in Group 1 than in Group 2. WOMAC pain and functionality sub-group scores were significantly higher in Group 1, but there was no significant difference between the two groups in terms of stiffness ([Table 2](#)).

The mean ages of Group A and Group B were 64.2 ± 9.57 and 65.16 ± 8.18, respectively, but the difference was not statistically significant (p=0.420). The BMI was 30.96 ± 4.26 in Group A and 31.15 ± 4.7 in Group B with no significant difference (p=0.163). VAS and WOMAC pain sub-group scores of Group A were higher than those of group B, but as with the other parameters, no statistically significant difference was found between the two groups ([Table 3](#)).

Pre- and post-treatment difference in VAS, WOMAC and the three-meter timed up-and-go test values were significantly different in both group A and group B. However, significant differences were not found between the two groups in terms of response to treatment ([Table 4](#)).

## DISCUSSION

This study had two objectives. The first was to determine the effect of the presence of PATB on pain and functional status of patients with knee osteoarthritis. VAS scores in Group 1 were higher than those Group 2, however there was no statistically significant difference between them ( $p=0.056$ ). In addition, WOMAC and the WOMAC pain subscale were predominantly higher in Group 1 ( $p=0.037$ , and  $p=0.011$ , respectively). The presence of PATB should be considered as a factor that increases the pain during the examination and treatment planning of patients with knee osteoarthritis. The 3-meter timed up go test times of the patients with PATB were significantly longer than those of the patients without PATB ( $p\leq 0.001$ ). The WOMAC functional scale was significantly higher in Group 1 ( $p=0.031$ ). This indicates that PATB has a significantly unfavorable effect on the functionality of patients with knee osteoarthritis, and this result is compatible with our hypothesis. That means the presence of PATB in the patients with osteoarthritis, causes an increase in knee pain and in the degree of severity of disability in osteoarthritis. This study also compared the efficacy of two methods, PT and local corticosteroid injection, in the treatment of PATB. The results demonstrate that both corticosteroid injection treatment and PT modalities are effective against pain. Very significant results were obtained for the measured parameters and all the WOMAC sub-scales (all  $p\leq 0.001$ ); however, when the two treatment methods were compared, no significant difference was found between them. To our knowledge, this is the first study to have compared the results of acute phase treatment of PATB.

**Table 1.** Demographic data of the patients

	Group 1 (n=60)	Group 2 (n=57)
Gender	49 F (81.6%) / 11 M (18.4%)	44 F (77.1%) / 13 M (22.3%)
Age (years)	64.7 ± 8.8	62.0 ± 8.5
BMI (kg/cm <sup>2</sup> )	31.1 ± 4.5	30.3 ± 3.4

Group 1: knee osteoarthritis + pes anserine tendino-bursitis; Group 2: knee osteoarthritis; F: female; M: male; BMI: body mass index

**Table 2.** Pretreatment measurement of parameters of group 1 and 2

	Group 1 (n=60)	Group 2 (n=57)
VAS	6.98 ± 1.65	6.42 ± 1.44
WOMAC*	44.11 ± 14.41	38.77 ± 12.17
WOMAC subscale		
Pain*	9.48 ± 3.47	7.78 ± 2.98
Stiffness	2.85 ± 1.5	2.92 ± 1.84
Physical function*	31.8 ± 10.92	28.03 ± 8.89
UGT*	26.7 ± 10.76	17.22 ± 6.36

Group 1: knee osteoarthritis + pes anserine tendino-bursitis; Group 2: knee osteoarthritis; VAS: Visual analog scale; WOMAC: Western Ontario and McMaster Universities osteoarthritis index; UGT: Up-and-go test  
\*statistically significant

**Table 3.** Pretreatment measurement of parameters of group A and B

	Group A (n=30)	Group B (n=30)
VAS*	7 (3–10)	7.5 (5–10)
WOMAC	43 (12–75)	43.5 (16–71)
WOMAC subscale		
Pain*	9 (3–17)	10 (5–20)
Stiffness	3 (0–6)	2.5 (0–6)
Physical function	33 (6–52)	31.5 (9–51)
UGT*	23 (16–75)	25.5 (26–54)

Group A: physical therapy group; Group B: corticosteroid injection group; VAS: Visual analog scale; WOMAC: Western Ontario and McMaster Universities osteoarthritis index; UGT: Up-and-go test  
\*statistically significant

**Table 4.** Pre- and posttreatment measurement of parameters of group A and B

	Group A (n=30)		Group B (n=30)	
	Pretreatment	Posttreatment	Pretreatment	Posttreatment
VAS*	7 (3–10)	4 (1–8)	7.5 (5–10)	5 (3–8)
WOMAC*	43 (12–75)	24 (7–47)	43.5 (16–71)	24 (5–57)
Pain*	9 (3–17)	5 (1–11)	10 (5–20)	5 (1–13)
Stiffness*	3 (0–6)	1.5 (0–4)	2.5 (0–6)	1.5 (0–4)
Physical* function	33 (6–52)	21 (5–35)	31.5 (9–51)	18 (3–40)
UPG*	23 (16–75)	18.5 (13–57)	25.5 (16–54)	21.5 (15–42)

Group A: physical therapy group; Group B: corticosteroid injection group; VAS: Visual analog scale; WOMAC: Western Ontario and McMaster Universities osteoarthritis index; UGT: Up-and-go test  
\*statistically significant

Knee osteoarthritis is a medical condition that causes severe pain and functional limitations. In osteoarthritis, the pain arises in the bone and periarticular structures. PATB is one of the most important causes of periarticular pain<sup>10</sup>. The prevalence of osteoarthritis together with PATB has been reported to be as high as 75%<sup>10-11</sup>. Study show that PATB has negative effects on functionality and aggravates the pain, so PATB should kept in mind when evaluating knee osteoarthritis.

Külcü et al. investigated factors such as age, gender, BMI, smoking habit, disease duration, educational level and exercise status that are associated with pain and disability in patients with knee osteoarthritis, and they found BMI was the most important factor associated with pain severity and functionality<sup>12</sup>. Malas et al. found meniscal bulging, Kellgren-Lawrence grade, Baker cysts, and joint effusion were significantly higher in symptomatic knee osteoarthritis, and they suggested these parameters are associated with the clinical findings<sup>13</sup>. Our study results also show that PATB is associated with clinical parameters and decreases the functionality and increases pain and joint stiffness. As a result of these findings, patients with osteoarthritis should be evaluated in terms of all these parameters. Co-occurrence of periarticular soft tissue impairments may contribute to symptom severity, and may be associated with higher disability. More clinical studies, especially those using imaging techniques, are needed to establish the association between PATB, and symptom severity and disability in knee osteoarthritis.

The most frequent pathologies detected by ultrasonography in painful knees as reported by one study were suprapatellar effusion (55%), Baker's cyst (25%), and pes anserine bursitis. Also in asymptomatic knees, suprapatellar effusion (25%) and Baker's cyst (5%) were detected whereas no pes anserine bursitis was found<sup>14</sup>. Yet another study described only two of 26 patients as having bursitis, determined by ultrasonography, who were clinically diagnosed as pes anserine bursitis<sup>10</sup>. This shows that the pes anserine bursa tenderness necessarily gives clinical signs and may lead to the determination of therapeutic approaches based on physical examination in the absence of ultrasonographic diagnostic techniques.

In Group A, not only PATB, but also osteoarthritis symptoms were treated, so the improvement in the parameters might be due to both. In Group B, however, only PATB was treated. As a result, the improvement in the assesment parameters shows that treatment of PATB alone is important, so diagnosis of PATB in knee osteoarthritis before treatment is very valuable. Detection and treatment of PATB in knee osteoarthritis, would decrease pain, resulting in improved daily living activities, and at the same time contribute to slowing the progression of osteoarthritis, by increasing compliance with exercise therapy.

In one study, 17 patients clinically diagnosed as pes anserine bursitis received a corticosteroid injection and 2 weeks later their VAS, WOMAC pain, and WOMAC functional indexes had significantly decreased<sup>10</sup>. Similar favorable results were obtained in the present study with a higher number of patients. In this study we have demonstrated that both corticosteroid injection treatment and PT modalities are effective for pain. Two treatment modalities were compared and there was no significant difference between them. If not contra-indicated (acute infection, poorly controlled diabetes mellitus, bleeding disorders, etc.), corticosteroid injection therapy should be considered as the primary treatment for PATB, since its results can be quickly obtained, its implementation is very simple, and it is an effective and inexpensive method. It could be the first choice of treatment method for patients with knee osteoarthritis and PATB, especially those with low compliance with physical therapy sessions.

The major weakness of this study is that we did not use any imaging techniques. The diagnosis was based on clinical presentation. Larson and Baum described some criteria for the diagnosis of PATB; feeling pain while climbing upstairs and downstairs, especially in the anteromedial part of the knee; morning stiffness of more than one hour; nocturnal pain; having difficulty while standing up; and sensitivity and edema over the anserine bursa<sup>15</sup>. In the present study, the patients were considered as having PATB if they had the pes anserine tenderness and at least two of the other 4 clinical signs. Ultrasonography would better make the distinction between bursitis and tendinitis. The injections were performed with direct infiltrations into the most sensitive point determined with palpation. In some patients, injections had the probability of not being directly into the bursa/tendinitis but into the surrounding tissues. This was one of the limitations of the present study. In further studies, comparison of injection techniques with direct palpation, and ultrasonographic guidance should be performed.

The results of the present study demonstrate that corticosteroid injection therapy for PATB has positive effects similar to physical therapy modalities in knee osteoarthritis. Although there is no superior effect over conventional methods of physical therapy, corticosteroid injections may be considered as an alternative method. The choice of treatment method may vary depending on physiatrist preference and the patients compliance with therapy. More studies with longer follow up periods are needed to evaluate long-term results in terms of clinical efficacy and the superiority of one treatment over the other.

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