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To cite this article: Kaynoosh Homayouni, Shima Foruzi & Fereshte Kalhori (2016): Effects of kinesiotaping versus non-steroidal anti-inflammatory drugs and physical therapy for treatment of pes anserinus tendino-bursitis: A randomized comparative clinical trial, The Physician and Sportsmedicine, DOI: 10.1080/00913847.2016.1199251

To link to this article: http://dx.doi.org/10.1080/00913847.2016.1199251

Accepted author version posted online: 08 Jun 2016.
Published online: 22 Jun 2016.

Article views: 22

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Effects of kinesiotaping versus non-steroidal anti-inflammatory drugs and physical therapy for treatment of pes anserinus tendino-bursitis: A randomized comparative clinical trial

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ABSTRACT

Objective: Pes anserinus tendino-bursitis is a condition caused by repetitive friction over the bursa or direct trauma to knee joint and it presents with proximal medial tibial pain and swelling. The aim of this study is to determine the effects of kinesiotaping in comparison with naproxen and physical therapy in treatment of pes anserinus tendino-bursitis.

Methods: In a randomized comparative clinical trial 56 patients with clinical diagnosis of pes anserinus tendino-bursitis were randomly assigned to kinesiotaping and naproxen/physical therapy (28 patients in each group). Kinesiotaping on the tender area in the form of space-correction (lifting) technique was used and repeated for three times with a one-week interval. Another group received naproxen (250mg TID for 10 days) and ten sessions of daily physical therapy. The visual analog scale (VAS) was used for evaluation of pain. The depth of swelling of the area was measured with sonography before and after treatment. Wilcoxon signed ranks test has been used for determining the influence of interventions on pain (VAS) and swelling scores in each group. The ANCOVA (Analysis of covariance) test was applied for comparing the influence of interventions on VAS and swelling scores after adjustment for co-variables.

Results: At end of the study, 27 patients remained in the kinesiotaping group and 19 patients in naproxen/physical therapy group. Treatment with kinesiotaping significantly decreased the pain (P=0.0001) and swelling scores (P=0.0001) in comparison with naproxen/physical therapy after adjustment for baseline characteristics. Kinesiotaping was safe without any complications except for a mild local skin irritation in one patient.

Conclusion: Kinesiotaping is more effective than naproxen plus physical therapy in reduction of pain and swelling in patients with pes anserinus tendino-bursitis.

Clinical trial registration: www.ClinicalTrials.gov identifier is NCT01680263

Introduction

The pes anserinus is a mixed tendon formed by coalescence of the sartorius, gracilis, and semitendinosus tendons; it inserts onto the proximal anteromedial tibia about 5 cm distal to the medial tibial joint line [1–3]. When the three muscles that form the pes anserinus were contracted, it results in knee flexion and tibial internal rotation [4]. The pes anserinus bursa lies deep to the pes anserinus tendon, which serves to reduce friction between the superficially located pes anserinus tendon, and structures including the medial tibia and the medial collateral ligament that lies deep to it [2]. Pes anserinus tendino-bursitis, first described in 1937, is a condition caused by repetitive friction over the bursa or direct trauma [4,5]. The prevalence of pes anserinus tendino-bursitis is variable (2.5–70%) in patients with knee pain [1–4,6–26]. Based upon clinical experience and limited available evidence, risk factors for pes anserinus tendino-bursitis include female sex, obesity, diabetes, knee osteoarthritis, and knee malignment [27]. The variable prevalence in the literature is probably due to studies in different populations with diverse prevalence of risk factors. Clinical presentation of the disease is usually proximal medial tibial pain and swelling 4–5 cm distal to the medial tibial joint line. Ascending or descending stairs or rising from a seated position may aggravate their symptoms. Patients with this condition have tenderness to palpation in the region of their pes anserinus bursa and may have local edema [1,13]. Diagnosis of pes anserinus tendino-bursitis is clinical, but diagnostic studies such as ultrasonography, computed tomography, and magnetic resonance imaging can be used to diagnose this condition [21–28].

The treatment of pes anserinus tendino-bursitis includes refraining from aggravating activities, local modalities such as heat, ice, ultrasound, iontophoresis, phonophoresis, electrical stimulation, transcutaneous electrical nerve stimulation (TENS), nonsteroidal anti-inflammatory drugs (NSAIDs) and injections with either corticosteroids or local anesthetics [1,3,5–7,9,14,16,18,21–26].
Kinesio Tape, also called Kinesio Tex Tape, is the original elastic adhesive tape developed by Dr. Kenzo Kase in 1979. It is a new treatment modality with unproven effect for various musculoskeletal injuries [29,30]. Kinesiotaping is a cotton strip with an acrylic adhesive that is used for treating athletic injuries and a variety of physical conditions. The therapeutic effect of the tape is to relax the overused muscles. Advocates claim that the wave pattern found on the kinesiotaping has a lifting effect on the skin which can diminish swelling and inflammation via improving circulation and reduce pain by removing pressure from pain receptors.

The aim of this study is to compare the effectiveness and safety of kinesiotaping with other traditional therapy (naproxen plus physical therapy) for the treatment of pes anserinus tendino-bursitis.

Patients and methods

Design

A prospective randomized comparative single-blind clinical trial was designed (Figure 1). The Local Research Ethics Committee of Shiraz University of Medical Sciences approved the study (CT-2012-106). After explanation of the exact nature of the study, a written informed consent was signed by each participant. Weight (kg) and height (m) were measured for calculation of body mass index (BMI). Soft tissue sonography of the pes anserinus bursa was used over the medial aspect of tibia below the medial tibial joint line. The interventions were conducted at the Physical Medicine and Rehabilitation Clinic in Shiraz University of Medical Sciences, Shiraz, Iran, between February and June 2014. The dependent variables, visual analog scale (VAS), and swelling scores were measured at baseline and after interventions by one blinded physiatrist.

Sample size

Sample size was calculated using the G*Power version 3.1.7 (Heinrich–Heine-University) software [31]. Significance level was set at 0.05 and an effect size of 0.65 with two-sided calculation was used. By these assumptions, to achieve a power of 0.95, a total sample size of 36 participants was necessary. Conservatively, 56 subjects were recruited due to our previous experiences.

Patients

A total of 60 patients with clinical diagnosis of pes anserinus tendino-bursitis who referred to the Physical Medicine and Rehabilitation Clinic in Shiraz University of Medical Sciences were screened for eligibility. The inclusion criteria were (1) age of 20–70 years, (2) confirmation of the clinical diagnosis of pes anserinus tendino-bursitis by one expert physiatrist, and (3) duration of symptoms for more than 3 months. The exclusion criteria were previous history of surgery on the knee joint, recent trauma to the affected knee joint, systemic, and rheumatic diseases like diabetes mellitus and rheumatoid arthritis, and a history of NSAIDs induced acid-peptic disease. One participant had a history of recent trauma and three patients were under treatment for rheumatoid arthritis. Fifty-six patients with mean age of 49.9 ± 6.7 years entered into the study by a simple drawing of lots and were randomly assigned in 1:1 ratio to parallel groups (28 patients in each group), including a kinesiotaping and a naproxen/physical therapy group. To have a random allocation, each patient received a number written on paper which was unknown to researchers that allowed participants’ assignment to the intervention groups. One patient in kinesiotaping group had lost the follow-up. In naproxen/physical therapy group, three patients had lost the follow-up due to unknown reason, three patients discontinued the naproxen due to dyspepsia, and three patients did not...
complete the physical therapy sessions. Finally, 46 patients (27 in the kinesiotaping group and 19 in naproxen/physical therapy group) were remained in the study. The baselines characteristics of all participants are shown in Table 1.

Interventions

The kinesiotaping was applied for 3 weeks over the tender area with space-correction technique. As shown in Figure 2, the space-correction (lifting) technique was used to create more space directly above the area of pain and swelling. The increased space created reduces pressure by lifting the skin away from the injured site. Kinesiotaping was repeated three times with a 1-week interval. Another group received treatment with naproxen (250 mg TID for 10 days) and 10 sessions of daily physical therapy. The physical therapy was applied for all patients by one physiotherapist with use of hot pack, TENS, and phonophoresis. All of the participants were advised to have a relative rest and reduce the strain on the injured knee, avoid climbing stairs, prolonged knee flexion position of less than 90°, and other irritating activities. In each session, the adherence of participants to these instructions was monitored and reminded by physiotherapist.

![Figure 2](image.jpg)

Figure 2. Kinesiotaping of knee joint for pes anserinus tendino-bursitis with space-correction technique.

Measurements and outcomes

BMI was calculated as the ratio of body weight to height squared. The pain was evaluated by standard pain VAS. The swelling score was determined with use of soft tissue sonography. The maximum depth of edematous area was measured in supine position with a high-frequency (10 MHz) linear array transducer and graded as score 1: <0.5 cm; score 2: 0.5–1 cm, and score 3: >1 cm. The primary outcome measures included differences in VAS score and swelling score before and after end of interventions. The secondary outcome measure was the number of participants with adverse events. All of the participants were evaluated by one expert physiatrist blinded to treatment allocations at the beginning and end of the study.

Statistical procedures

The statistical analysis was performed using SPSS for Windows (version 16.0, SPSS Inc., Chicago, IL). The data were evaluated for normal distribution by Kolmogorov–Smirnov test. Due to non-normal distribution of the data, the Mann–Whitney test was used for comparison of baseline characteristics between treatment groups and the Wilcoxon signed ranks test has been used for determining the influence of treatment modalities on pain (VAS) and swelling scores in each group. The ANCOVA (Analysis of covariance) test was applied for comparing the influence of interventions on VAS and swelling scores after adjustment for baseline data including age, gender, BMI, duration of symptoms as co-variables. A P value of less than 0.05 was considered as significant.

Results

In both treatment groups there was a significant decrease in pain (VAS) score (kinesiotaping group: Z = −4.56, P = 0.0001; naproxen/physical therapy group: Z = −3.45, P = 0.001) and swelling score (kinesiotaping group: Z = −4.69, P = 0.0001; naproxen/physical therapy: Z = −4.14, P = 0.0001) (Table 2).

![Table 2](image.jpg)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Kinesiotaping group (n = 27)</th>
<th>Naproxen + physical therapy group (n = 19)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAS (baseline)</td>
<td>8.07 ± 2.4</td>
<td>6.63 ± 3.0</td>
<td>0.955</td>
</tr>
<tr>
<td>VAS (after treatment)</td>
<td>1.29 ± 1.6</td>
<td>3.53 ± 2.7</td>
<td>P value = 0.001</td>
</tr>
<tr>
<td>ΔVAS</td>
<td>6.78 ± 1.9</td>
<td>3.11 ± 2.8</td>
<td>0.0117</td>
</tr>
<tr>
<td>Swelling score (baseline)</td>
<td>2.13 ± 0.7</td>
<td>2.42 ± 0.6</td>
<td>0.824</td>
</tr>
<tr>
<td>Swelling score (after treatment)</td>
<td>0.48 ± 0.61</td>
<td>1.26 ± 0.9</td>
<td>P value = 0.001</td>
</tr>
<tr>
<td>ΔSwelling score</td>
<td>1.80 ± 0.6</td>
<td>1.26 ± 0.5</td>
<td></td>
</tr>
</tbody>
</table>

VAS: Visual analog scale.
was significantly more effective on reduction of pain (VAS) 
\( P = 0.0001 \) and swelling scores \( P = 0.0001 \) after adjustment 
for baseline characteristics including age, gender, BMI, duration 
of symptoms, baseline VAS, and swelling scores as co-
variables.

The kinesiotaping had no complications and only one 
patient had mild local skin irritation that followed the complete 
treatment course. Three patients in the naproxen/physical 
therapy group have developed dyspepsia and discontinued the naproxen.

**Discussion**

According to the results of this study, both interventions 
(kinesiotaping and naproxen/physical therapy) are effective 
for treatment of pes anserinus tendino-bursitis with decreasing 
pain and swelling. Comparison of treatment modalities 
revealed that kinesiotaping is more effective than naproxen/
physical therapy.

Lack of administration of drugs for the whole period and 
lack of attendance in physical therapy periods are the major 
reasons for treatment failure of many inflammatory muscu-
loskeletal system disorders. Perhaps the superiority of kine-
siotaping to medical treatment is because there is less need 
to the patient’s cooperation in kinesiotaping therapy. 
Another reason which shows kinesiotaping is more effective 
than medical treatments is due to its function on the knee 
that is independent of the patient’s activity. Kinesiotaping 
was continuously applied during all of the patient’s activity 
and has its continuous influence even if the patient performs 
activities which cause pressure on the tendons. The manufacturer claims that the kinesiotaping method is a 
rehabilitative taping technique that is designed to facilitate 
the body’s natural healing process while providing support 
and stability to muscles and joints without restricting the 
body’s range of motion as well as providing extended soft 
tissue manipulation to prolong the benefits of manual therapy 
administered within the clinical setting. Kinesiotaping alleviates pain and facilitates lymphatic drainage by lifting 
the skin microscopically. This lifting increases interstitial 
space and allowing for a decrease in inflammation of the 
affected areas and reducing pressure while enabling a more 
effective flow of blood and lymphatic fluid in and out of the 
target area [Kinesio Taping Method. Available at [http://
www.kinesiotaping.com]], although there is no evidence for this. The obtained effects of kinesiotaping are probably from 
continuous local pressure and restriction of specific movements. 
However, in patients who receive medical and physical 
treatment, there is more risk of pressure on their tendons which are inflamed and do not have any external protection.

To the best of our knowledge, there is no clinical trial to 
show the effectiveness of kinesiotaping for treatment of pes anserinus tendino-bursitis. Bicici et al. evaluated the effects 
of kinesiotaping on functional performance of basketball players 
with chronic inversion ankle sprains and improvements were seen in some functional performance tests [32]. Another study 
on patients with mechanical neck pain compared the effectiveness of cervical spine thrust manipulation and 
kinesiotaping applied to the neck and revealed that both modalities exhibited similar reductions in neck pain intensity 
and disability and similar changes in active cervical range of motion [33].

This is a randomized single-blind clinical trial for comparison of two different modalities for treatment of pes anserinus 
tendino-bursitis. All of the patients were evaluated before 
starting the interventions and for outcome measures by one 
expert physiatrist blinded to the treatments. With regard to 
the patients’ pain before and after treatment, in both groups 
the pain decreased after treatment. But the amount of pain 
reduction in the kinesiotaping group was much more than the 
naproxen/physical therapy group. This supports the effect of 
kinesiotaping on pain reduction by removing pressure from 
pain receptors. The local swelling (edema) that was evaluated 
with soft tissue sonography was decreased after treatment in 
both groups. The reduction was also more obvious in the 
kinesiotaping group, which supports the effect of kinesiotap-
ing on decreasing inflammation. It should be noted that there 
are some limitations in this study. The sample size was small 
and the patients had a short-term follow-up. In addition, it 
would have been better to have more objective assessment 
results. The study design was single-blinded and did not 
include a placebo group to rule out placebo effect or natural 
changes over time as potential reasons for the improvements 
achieved in both groups.

**Conclusion**

This comparative clinical study shows that kinesiotaping can 
be an effective, nonaggressive treatment without any adverse 
effect for pes anserinus tendino-bursitis and is superior to 
naproxen plus physical therapy. With regard to the side effects 
of NSAIDs and contraindications of their prescription in spec-
ific situations such as acid-peptic disease and renal failure, it 
seems that use of kinesiotaping in treatment of pes anserinus 
tendino-bursitis may be a suitable treatment modality. Further 
randomized, double-blind, placebo-controlled clinical trials 
with a larger sample and longer follow-up are needed for 
confirmation of the effects and safety of kinesiotaping for 
treatment of pes anserinus tendino-bursitis.

**Acknowledgements**

The authors wish to thank the participants in this study. We thank Dr. 
Najaf Zare, the statistician, for his kind help in statistical analysis at the 
Center of Clinical Research Development at the Nemazee Teaching 
Hospital. We are grateful to S. Hannan Kashfi (MA in English teaching 
and faculty of Larestan School of Medical Sciences) for his valuable 
cooperation in English proofreading of the manuscript.

**Declaration of interest**

The authors have no relevant affiliations or financial involvement with any 
organization or entity with a financial interest in or financial conflict with 
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testimony, grants or patents received or pending, or royalties.
References


