

TREATMENT OF PATELLAR TENDINOPATHY

Lence Nikolovska

Faculty of Medical Sciences, University "Goce Delcev" – Stip, N. Macedonia,
lence.nikolovska@ugd.edu.mk

Bozidar Simic

Faculty of Medical Sciences, University "Goce Delcev" – Stip, N. Macedonia,

Abstract: Patellar tendonitis, also known as the jumper's knee is an inflammation of the tendon or cord of fibrous tissue that attaches a muscle to a bone. It has an incidence of about 20% in jumping athletes, including volleyball, basketball and handball athletics. It is often accompanied by tenosynovitis, which is an inflammation of the lining of the tendon sheath. The cause of the inflammation may result from repeated trauma or excessive straine of the tendon. Chronic overuse of tendons leads to microscopic tears within the collagen matrix, which gradually weakens the tissue. These causes can lead to "local qi and blood congestion in the channels". In most cases good results are obtained with conservative treatment that includes medication and physical therapy. According to TCM, acupuncture not only help decrease the pain, but will also enhance body's own healing ability. Needling the affected area bring in more blood flow and oxygen and help the tissue recover. Research shows that overall, acupuncture can be helpful to reduce tendonitis pain and increase circulation to/around a tendon.

The aim of this study was to evaluate and compare the effectiveness of conservative and complementary treatment in patients with patellar tendinitis.

Methods of research: The research was conducted in cooperation with the Public Institution „Center for Traditional Chinese Medicinethe“and the Recreation Center at the University "Goce Delcev" - Stip, for a period of 1 months. The study included 15 participants (4 women and 11 men) with previously diagnosed Patellar tendinopathy. Each patient was asked for consent to participate in the study. Participants are divided into two groups, Group A (7 respondents) and Group B (8 respondents). Group A participants received conservative treatment that included drug therapy, physical therapy, and kinesitherapy (eccentric exercises), while group B respondents received complementary treatment with acupuncture and electroacupuncture, moxibustion, and kinesiotaping techniques. Treatment of Patellar tendonitis included 4 weeks of acupuncture treatment. We used the acupuncture protocol for Patellar tendonitis. The points were selected according to textbook acupuncture point prescription.

Results: Before starting treatment, each patient fills out the Questionnaire Lysholm Knee Score Standard (LKSS).

The same tests are done at the end of treatment. The results are shown in Tables. The present study demonstrated a statistically significant difference before treatment and after 4 weeks of acupuncture at tender points. The results demonstrated, not only a reduction in pain threshold sensitivity, but also knee motor impairment.

The researchers determined that acupuncture and electroacupuncture therapy, plus moxibustion and kinesiotaping techniques is more effective than conservative treatment with drug therapy (NSAID) and physical therapy for relief of knee Patellar tendonitis .

Conclusion: This is a clinically significant finding for important reasons. First, the acupuncture protocol combined with moxibustion does not cause the gastrointestinal distress common with NSAID intake. Second, this is a proven treatment option for the effective relief of disability and pain due to knee Patellar tendonitis. The NSAID (nonsteroidal anti-inflammatory drug) had a faster onset of effective action but acupuncture produced significantly greater positive patient outcomes for long-term relief.

Keywords: Patellar tendonitis, pain, physical therapy, kinesitherapy, acupuncture, moxibustion, taping techniques.

1. INTRODUCTION

Also known as "jumper's knee", patellar tendinitis is a condition that results from an inflammation of the patellar tendon. Patellar tendon is the connecting structure that bridges the patella (also known as knee cap) to our tibia. If we look at the knee and knee cap, we can find that our knee cap is a "loose and floating" bone (known as sesamoid bone) which connects our quadriceps (thigh front muscles) to the tibia via the patellar tendon. So that means that patellar tendon is the connecting rope of the strong front of thigh muscles (quadriceps) which is instrumental in the way we move - it helps quadricep muscles to straighten/extend the lower leg so that we can walk, run, sprint, kick a ball or pedal a bicycle. Tendons are white tissue and lack or have very little blood flow to the area which is why healing can take a long time. Often times months and sometimes years. Contrast that to a muscle which is very red and full of oxygen and we can see why muscle and soft tissue heal so much quicker.

The main symptoms of patellar tendinitis are generally pain and swelling over the patellar tendon area. Sharp pain is usually experienced during activity/sports doing jumps or runs and tends to "linger" as a dull aching pain after the

activities. Upon testing and palpations, patient often find that direct pressure on the patellar tendon can be very sore or even painful, and this is usually the tell-tale sign. The simplest and commonest cause of patellar tendinitis is basically overuse and wear-and-tear. This happens usually in individuals who participate in sports/activities that involves in lots of jumping such as: basketball, handball, volleyball - hence that's why it was called "jumper's knee". These causes can lead to what's called "local qi and blood congestion in the channels" according to traditional Chinese medicine.

A torn patellar tendon does not heal well on its own, and left untreated will lead to weakness of the quadriceps muscle and difficulty with routine activities, including walking. Once the cause of the pain is isolated a treatment plan will be constructed to directly and uniquely address the knee pain.

Treatment for patellar tendonitis is usually focused on pain reduction. The treatment's primary focus involves relaxation of the quadriceps muscles. As an immediate treatment for overuse tendinopathy, doctors recommend the RICE program: rest, ice, compression, and elevation of the injured tendon and a short course of anti-inflammatory drugs to help inflammation and pain. According to Laskowski, M.D., ice is a better choice than heat — especially for about the first three days. Ice numbs pain and causes blood vessels to constrict, which helps reduce swelling. After the first three days, heat may provide better benefit for chronic tendinitis pain. Heat can increase blood flow to an injury, which may help promote healing. Heat also relaxes muscles, which promotes pain relief.

Most cases of patellar tendinitis can be successfully treated with physical therapy.

- ✓ Extracorporeal shock wave therapy uses high intensity sound waves directed at the tendon to promote healing and may be effective in relieving the pain associated with patellar tendonitis.
- ✓ Ultrasound (US) and electrical stimulation have been widely used to promote recovery after tendon injuries.
- ✓ Managing insertional tendinopathy through stretches and exercises is often with varied results. The more severe the tendinopathy, the less likely stretching would help. In fact, stretching results in further compression of the tendon at the irritation point, which actually worsens the pain.
- ✓ Eccentric strengthening, manual therapy and "friction" or "deep friction massage can promote healing.
- ✓ The patient should wear a brace and do physical therapy for 3 to 6 weeks while the tendon heals.

Research shows that overall, acupuncture can be helpful to reduce tendonitis pain and increase circulation to/around a tendon. Not only acupuncture help decrease the pain, but also enhance the body's own healing ability. Acupuncture, in particular, is the treatment of choice, giving excellent results in both acute and chronic cases. Acute cases can often be resolved in a few treatments. However, many people with this problem present with very chronic conditions. These cases can be treated with good results too, but the more long-standing the condition, the longer it will take to resolve.

Patients with Tendonitis frequently exhibit a primary deficiency in the liver meridian, with a relative excess in the gallbladder meridian. In addition to needling treatment on the liver meridian and the supporting kidney meridian, treatments using moxibustion may also be included. Needling and/or moxibustion may also be directly applied to painful areas and related sore points. Research shows that acupuncture brought up blood volume and oxygen saturation levels to injured tendons. This addresses the local symptoms by improving the circulation of qi and blood in the affected area.

The aim of this study was to evaluate and compare the effectiveness of conservative and complementary treatment in patients with patellar tendinitis.

2. METHODS OF RESEARCH

The research was conducted in cooperation with the Public Institution - Center for Traditional Chinese Medicine and the Recreation Center at the University "Goce Delcev" - Stip, for a period of 1 months. The study included 15 participants (4 women and 11 men) with previously diagnosed Patellar tendinopathy. Each patient was asked for consent to participate in the study. Participants are divided into two groups, Group A (7 respondents) and Group B (8 respondents).

Group A participants received conservative treatment that included:

- RICE program;
- Ice therapy (the first three days) to constrict the blood vessels and reduce swelling;
- Heat therapy (after the first three days) to increase blood flow to an injury, relaxes muscles and promotes pain relief;
- Anti-inflammatory drugs to help inflammation and pain;
- Physical therapy (Extracorporeal shock wave therapy (ESWT), Ultrasound (US), Electrical stimulation (ES) to promote healing and may be effective in relieving the pain;

- Kinesitherapy (eccentric strengthening exercises), manual therapy and massage (“frictioning” or “deep friction massage”) to promote healing;

Group B respondents received complementary treatment that included:

- Acupuncture and electroacupuncture combined with moxibustion:
 - Treatment of Patellar tendonitis included 4 weeks of acupuncture treatment.
 - Manual acupuncture was applied prior to the administration of electroacupuncture. After elicitation of a deqi sensation, the acupuncture needles were connected to an electroacupuncture device with a continuous wave. The needles were retained for 30 minutes once electroacupuncture began. Electroacupuncture session was conducted 20 consecutive days.
 - Moxa-heated acupuncture needles increase acupuncture point stimulation and bioelectrical circulation along energy meridians.
 - We used the acupuncture protocol for Patellar tendonitis. The points were selected according to textbook acupuncture point prescription
 - Participants received **deep needling** acupuncture at **ST35** (Dubi - lateral Xiyan) and medial **Xiyan** (MN-LE-16) combined with electroacupuncture. **Medial Xiyan and ST35 are the eyes of the knee combination.**
 - **ST35** is located with the knee flexed and is translated as **calf’s nose**. Along with medial Xiyan, this point is also called lateral Xiyan and is considered part of the Xiyan pairing. The point is at the lower border of the patella, below the patella and lateral to the patellar ligament.
 - **Xiyan** is translated as **eyes of the knee**. Medial Xiyan is in the hollow formed by a flexed knee that is below the patella. It is medial to the patellar ligament. Medial Xiyan is an extra point and is not considered part of a primary acupuncture channel.
 - Another point combined with the Xiyan combination is extra point **Xixia** (M-LE-15). Translated as below knee, this point is located at the patellar ligament at the inferior margin of the patella. Together, Xi Xia (Hsi Hsia) and Xiyan are a powerful trinity for the treatment of knee Patellar disorders.
- In addition, the participants received standard needling acupuncture at **Heding** (M-LE-27), **GB34** (Yanglingquan) and **ST36** (Zusanli). **ST34** (Liangqui) and **SP9** (Yinglingquan).
- Kinesiotaping techniques:
 - As the aim of patella tendon taping is to reduce symptoms. Tape is wrapped around the tendon, just below the knee. The strapping compresses the patella tendon. As a result, it changes the angle of the tendon against the patella. Therefore, the part of the tendon where the forces are transmitted changes. This takes the stress away from the painful, part of the tendon and diverts it to another part.

3. RESULTS

The severity of Patellar tendonitis were evaluated based on the **Lysholm Knee Score Standard** (LKSS). Each patient fills out the Questionnaire Lysholm Knee Score Standard (LKSS). before and after the treatment course.

LYSHOLM KNEE SCORING SCALE includes 8 items: **1)** limp, **2)** support, **3)** locking, **4)** instability, **5)** pain, **6)** swelling, **7)** stair climbing, and **8)** squatting.

Individual items are scored differently, using individual scoring scales: **1)** limp (0, 3, 5), **2)** support (0, 2, 5), **3)** locking (0, 2, 6, 10, 15), **4)** instability (0, 5, 10, 15, 20, 25), **5)** pain (0, 5, 10, 15, 20, 25), **6)** swelling (0, 2, 6, 10), **7)** stair climbing (0, 2, 6, 10), and **8)** squatting (0, 2, 4, 5).

Each possible response to each of the 8 items has been assigned an arbitrary score on an increasing scale. The total score is the sum of each response to the 8 items, of a possible score of 100.

Possible score range: 0–100, where 100 = no symptoms or disability. Scores are categorized as excellent (95–100), good (84–94), fair (65–83), and poor (≤64)

Table 1. Achieved results in Group A participants receiving conservative treatment - before the start and after the completion of the rehabilitation

Tested parameters	Before the start of the rehabilitation	After the completion of the rehabilitation	Achieved difference %
1)Limp	3	5	40%
2) Support	2	5	60%
3)Locking	6	10	40%
4) Instability	10	20	50%

5) Pain	5	15	66.6%
6) Swelling	6	10	40%
7) Stair climbing	2	6	66.6%
8) Squatting	2	4	50%
TOTAL	36	75	39 (52 %)

Table 2. Achieved results in Group B participants receiving complementary treatment - before the start and after the completion of the rehabilitation

Tested parameters	Before the start of the rehabilitation	After the completion of the rehabilitation	Achieved difference%
1)Limp	3	5	40%
2) Support	2	5	60%
3)Locking	6	15	60%
4) Instability	10	25	60%
5) Pain	5	20	75%
6) Swelling	6	10	40%
7) Stair climbing	2	10	80%
8) Squatting.	2	5	60%
TOTAL	36	95	59 (62.1%)

4. ANALYSIS OF THE RESULTS

After the completion of the treatment all 15 respondents reported an improvement in their symptoms

The results obtained are shown in Table 1 and Table 2.

Table 1 shows achieved results in Group A participants receiving conservative treatment - before the start and after the completion of the rehabilitation. It can be noticed that in the patients from Group - A, the average grade from the Questionnaire before the start of the treatment was 36 points. After completion of treatment, the average score is 75 points, which is a reduction of symptoms by 39 points or 52%.

Table 2 shows achieved results in Group B participants receiving complementary treatment - before the start and after the completion of the rehabilitation. It can be noticed that in the patients from Group - A, the average grade from the Questionnaire before the start of the treatment was 36 points. After completion of treatment, the average score is 95 points, which is a reduction of symptoms by 59 points or 62,1%. The present study demonstrated a statistically significant difference before treatment and after 4 weeks of acupuncture at tender points. The results demonstrated, not only a reduction in pain threshold sensitivity, but also knee motor impairment. The researchers determined that acupuncture and electroacupuncture therapy, plus moxibustion and kinesiotaping techniques is more effective than conservative treatment with drug therapy (NSAID) and physical therapy for relief of knee Patellar tendonitis .

5. DISCUSSION

One of the great strengths of Chinese medicine is that successful treatment does not depend on establishing exactly what the pattern of causation is, but in correctly identifying how the flow of the body's energies have been affected and whether this is a local problem or one which is a manifestation of a more systemic pattern.

Patients with Tendonitis frequently exhibit a primary deficiency in the liver meridian, with a relative excess in the gallbladder meridian. Needling treatment on the liver meridian and the supporting kidney meridian, bring in more blood flow and oxygen and help the tissue recover. Acupuncture is stellar at treating any type of tendon issue and drastically reducing the amount of healing time required.

6. CONCLUSION

This is a clinically significant finding for important reasons. First, the acupuncture protocol combined with moxibustion does not cause the gastrointestinal distress common with NSAID intake. Second, this is a proven treatment option for the effective relief of disability and pain due to knee Patellar tendonitis. The NSAID (nonsteroidal anti-inflammatory drug) had a faster onset of effective action but acupuncture produced significantly greater positive patient outcomes for long-term relief. Acupuncture and electroacupuncture reduce inflammation, relieves pain, aids the healing process and helps people to avoid surgery.

BIBLIOGRAPHY

- Cheng, R.S.S. (1989). Neurophysiology of electroacupuncture analgesia. In: Pomeranz B, Stux G (eds). *Scientific Basis of Acupuncture*. Berlin: Springer Verlag, 119-136.
- De Vries, A., Zwerver, J., Diercks, R et al. (2015). Effect of patellar strap and sports tape on pain in patellar tendinopathy: a randomized controlled trial. *Scand J Med Sci Sports* . doi: 10.1111/sms.12556.
- Han, J.S. (1989). Central neurotransmitters and acupuncture analgesia. In: Pomeranz B, Stux G (eds). *Scientific Basis of Acupuncture*. Berlin: Springer Verlag, 7-33
- Larsson, M.E., Kall, I. & Nilsson-Helander, K. (2012). Treatment of patellar tendinopathy - a systematic review of randomized controlled trials. *Knee surgery, sports traumatology, arthroscopy: official journal of the ESSKA* 20, 1632-1646, doi: 10.1007 / s00167-011-1825-1 (2012).
- Liu, N. (2013). "Clinical Observations on Deep Needling of Points Dubi and Medial Xiyan for the Treatment of Knee Osteoarthritis." *Shanghai Journal of Acupuncture and Moxibustion* 857-858.
- Sun, K., Huang, X.Y., & Wei, F.L. (2015). Clinical study on the treatment of knee by acupuncture of Wei's acupoints. *Anhui Medical and Pharmaceutical Journal*. 19(8).
- Tiemessen, I. J., Kuijer, P. P., Hulshof, C. T. & Frings-Dresen, M. H. (2009). Risk factors for developing jumper's knee in sport and occupation: a review. *BMC research notes* 2, 127, doi: 10.1186 / 1756-0500-2-127