

Patellar Tendinopathy: A Physiotherapist's Perspective

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ABSTRACT

The pathology of patellar tendinopathy and the mechanisms of pain are poorly understood. The most popular treatment modality is the Eccentric overload Exercise. However, there is insufficient evidence to recommend a specific protocol and yet it is the most commonly used treatment modality. The aim of this case study is to present the possible mechanisms of pain and a treatment approach on a patient who was diagnosed as having patellar tendinopathy. It is suggested that hyper extension of the knee might be the source of patellar tendon pain in this patient. Following a course of pulsed short wave diathermy the patient was symptom free and remained so at 6 month review. Further studies to evaluate the effectiveness of pulsed short wave diathermy is suggested.

Keywords: Patellar Tendinopathy; Pulsed Short Wave Diathermy; Jumper's Knee; Ultrasound; Hyper-Extension

1. Introduction

Pathology of patellar tendinopathy is poorly understood [1] and the mechanism is unclear [2]. The diagnosis is made on the basis of gradual onset of pain in the tendon, morning stiffness, area of tenderness and localised swelling and by using the diagnostic tools such as MRI and Ultra-sonography. However the diagnostic findings does not correspond precisely with clinical findings either [3].

1.1. Conservative Management

Conservative management is predominantly empirical and clinically founded. There is a profound lack of valid and reliable diagnostic and assessment tools, [4]. The treatment is often based on the physician's personal experience, rather than clinical evidence [2].

Various conservative treatment modalities such as Relative Rest followed by strengthening exercises, Heat, Massage, Electrical stimulation, Pulsed Ultrasound, and transverse friction, Extracorporeal shock wave therapy [2], Low Level Laser Treatment [5] were also tried. The effectiveness of these modalities are also proven to be ineffective.

1.2. Eccentric Overload Exercise

The most popular treatment modality is the Eccentric overload Exercise [6]. Several forms of eccentric overload exercises been tried: Single-leg horizontal and with decline board squats, [4,7-9] and two-legged eccentric overload training [10] using Bromsman device were tried with some positive effects on patellar pain. However, the

results are insufficient to recommend a specific exercise protocol [11].

1.3. Surgical Management

When conservative treatment fails, Surgical interventions such as Barbotage/Dry Needling, autologous blood [12,13] and surgical decompression with resection of the patellar tendon & open stimulation techniques [14-16] were also considered. However no advantage was demonstrated for surgical treatment compared with eccentric strength training [17].

Given this scenario the aim of the case report is to present the mechanisms of pain, diagnosis and a non-invasive treatment approach. Visual Analogue Scales for pain, tenderness on palpation and activities of daily living were used as outcome measures.

2. Case Report

A 26 years old lady was referred to physiotherapy with a diagnosis of patellar tendinopathy. An ultrasound scan revealed active infra-patellar tendonosis of moderate severity with moderate hyperaemia within a thickened infra-patellar tendon (8 mm).

The patient's main complaints were: long-standing constant dull pain in the left knee worse since a year, tends to limp at times due to pain, difficulty in coming down the stairs, tendency for the knee to give way and occasional disturbed sleep. On Visual Analogue Scales the perceived pain was 2 - 3/10, a score of 10 being worse.

Past History revealed that the patient had been experi-

encing constant dull pain in the knee for the past 9 years. On observation the patient stands with gross hyper extension of the knees.

2.1. Examination

A minimum to moderate degree of swelling in the left knee, laxity of collateral and anterior cruciate ligaments, and gross wasting and weakness of the left Quadriceps muscles were present. On deep palpation there was marked tenderness at the apex of patella and patellar tendon and moderate degree of tenderness at the patellar tendon bursae were present.

2.2. Impression

The duration of symptoms, the general laxity of ligaments suggest hyper mobility of the knee. Therefore the patellar tendon pain may be due to the biomechanics of the knee in the first instance, subsequently resulting in chronic irritation of the bursae and the patellar tendon. This in turn may have led to chronic pain, swelling and muscle weakness.

2.3. Aim of the Treatment

The primary aim was to alter the dynamics of the knee joint and to reduce the pain in the first instance and then to strengthen the Quadriceps.

2.4. Treatment

In order to relieve pain, tenderness and swelling, the patient was given a session of pulsed ultrasound to the patellar tendon and was advised to apply an ice pack for 10 minutes, twice a day for about 5 days. The patient was also given a heel pad to alter the dynamics of the knee/s. Since there was no change in the symptoms at the following session, it was decided to try Pulsed Short Wave Diathermy (PSWD) which is deemed to be effective in relieving pain and swelling. The patient was given 9 sessions of PSWD in all, at a frequency of 110 Hz to 150 Hz and at an intensity level of between 4 and 5 for a duration of 12 minutes. Both induction and capacitor methods were used as and when indicated to reduce pain, tenderness and swelling. Following pulsed short wave diathermy all the stated symptoms gradually reduced during the course of the treatment and the patient was symptom free following 9 sessions. Quadriceps strengthening exercises using 1 kg mass, 3 sets of 10 repetitions, twice a day were introduced following pain relief and was reviewed 2 weeks later.

2.5. Review

At the time of review the patient was coping well with

the exercises and there were no adverse effects and remained symptom free. The patient was given advice on progression of exercises and was reviewed 6 weeks later. At the time of review the patient continue to remain symptom free and the quadriceps muscle power continue to improve. The gait was normal, was able to negotiate the stairs without pain and no sleep disturbance. Therefore the patient was advised to continue the exercises and was taken of the treatment list with a view to review in about 6 month's time.

At 6 month review, the patient continue to remain symptom free, and was able to involve herself in new sporting activities such as kick boxing, hill walking, yoga etc Therefore the patient was discharged with advise to continue exercises as a routine.

3. Discussion

This patient presented a history of patellar tendon pain for almost 10 years. Considering the localised symptoms, it was decided to try ultrasound since it is found to have beneficial effects on collagen synthesis and on the tensile strength of the tendon [18], promote healing of fractures [19-22].

A frequency of 3 MHz, 1:1 ratio at an intensity of 0.5 watt per square cm for a duration of 3 minutes was used initially to relieve localised tenderness. In addition the patient was also advised to apply an ice pack 10 minutes x twice a day in order to relieve pain and swelling. Since there was no change in symptoms following a session of ultrasound and the application of ice twice a day for about 5 days, it was decided to change the treatment to pulsed short wave diathermy to reduce pain and swelling.

Pulsed Short wave Diathermy was deemed useful as an effective modality for acute soft-tissue injuries, haematomas, acute Osteo-arthritis, bursitis, and Rheumatoid arthritis and has fewer contra-indications [23]. Further more, Short Wave Diathermy was also found to increase fibroblast [24] and cell proliferation of human chondrocytes [25] and a single exposure observed to produce an increase of 30% proliferation measured on the 7th day following the exposure and thus may have a long-term effect as well. Furthermore, using Short Wave Diathermy, pre-isokinetic exercise in women with Osteo-Arthritis of the knee was also found to augment the exercise performance, reduces pain and improves function [26]. Hence Pulsed Short Wave Diathermy was chosen as a suitable treatment modality.

Following 6 sessions of Pulsed Short Wave Diathermy using a circuplode (induction method) and condenser electrodes (capacitive method) as and when indicated, the only symptom the patient experiencing was that of localised tenderness at the apex of patella. Since the area of tenderness was small and localised, ultrasound was tried

once again along with pulsed short wave diathermy. However this appeared to have increased the patient's knee symptoms. Therefore pulsed short wave diathermy on its own was used for the next 2 more sessions, following which there was no tenderness along the patellar tendon or at the apex. In short the patient was symptom free.

Quadriceps strengthening exercises using 1 kg mass 3 sets of 10 repetitions, twice a day were introduced following pain relief. The patient remained symptom free at subsequent reviews at 2 and 6 weeks and 6 months and was able to walk normally, able to negotiate the stairs without pain and also involve in new sporting activities such as kick boxing, hill walking, yoga etc.

4. Conclusion

The source of patellar tendon pain could be multi-factorial. The patellar tendon pain in this patient may be due to the biomechanics of the knee *i.e.* hyper extension of the knee, resulting in chronic irritation of the bursae and the patellar tendon. Pulsed short wave diathermy found to be effective in alleviating these symptoms followed by quadriceps strengthening exercise to restore function. Further studies to evaluate the effectiveness of pulsed short wave diathermy in the management of patellar tendinopathy are suggested.

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