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Case report

Patellofemoral pain: Challenging current practice – A case report

Benjamin E. Smith [a, *], Paul Hendrick [b], Pip Logan [b]

[a] Derby Teaching Hospitals NHS Foundation Trust, Physiotherapy Outpatients (Level 3), London Road Community Hospital, Derby, DE1 2QY, UK
[b] University of Nottingham, UK

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ABSTRACT

Patellofemoral pain (PFP) is a common problem in young people, with 1 in 6 suffering at any one time. It is unclear which management approach is the optimal method for treating PFP in the long term, with traditional physiotherapy examination focusing on assessing for specific structural dysfunction. A rationale for a different assessment and treatment approach, one that moves the focus away from a biomedical/tissue pathology model towards one directed at the neurophysiology of pain, has been suggested.

The patient was a 21 year old male with a 6 year history of PFP with previous failed physiotherapeutic treatment. He reported previous multiple healthcare practitioners' advice to avoid activities that were painful as reasons for being unable to participate in sporting activities. No specific structural testing was performed, such as specific muscle strength, length, foot position, patella movement and position, or movement patterns.

Descriptions of tissue based pathology models of pain, *e.g.* patella mal-tracking, were actively discouraged and challenged. The patient was taught to perform one uncomfortable/painful exercise as part of his rehabilitation programme twice a day.

The patient achieved 80% improvement in his symptoms over 7 appointments and a return to physical activity following a 5 month rehabilitation programme purposively designed to elicit pain by means of gradually exercising and loading the tissues. This case report highlights the need for further research into exercise protocols for patients suffering with PFP based upon neurophysiology models of pain.

1. Introduction

Patellofemoral pain (PFP) is a debilitating disorder, causing significant pain and disability (Kooiker et al., 2014). It is one of the most common reasons why young people seek medical help with 1 in 6 suffering at any one time (Vahasarja, 1995; Mølgaard et al., 2011). Symptoms typically lead to withdrawal of participation in exercise and physical activity, with consequent development of fear and anxiety (Piva et al., 2009b; Rathleff et al., 2012; Doménech et al., 2014).

Long term outcomes are poor, with 91% of patients reporting pain and dysfunction at a minimum follow-up of 4 years post diagnosis (Stathopulu and Baildam, 2003). Although strengthening exercises have been shown to have the best evidence for improvements in pain and disability, a recent study of reviews concluded that it is unclear which management approach is the optimal method for treating PFP in the long term (Papadopoulos et al., 2015).

A rationale for an assessment and treatment approach that moves the focus away from a biomedical/tissue pathology model, towards one directed at the neurophysiology of pain, has been suggested (Smith et al., 2015a). It is thought that exercises that are purposely painful could have a positive impact upon pain and function whilst reducing fear avoidance and catastrophising beliefs (Littlewood et al., 2013; Smith et al., 2015a). The purpose of this case report is to describe this method of assessment and treatment applied to a patient with long term severe and debilitating PFP with previous failed physiotherapeutic treatment.

2. Case description

2.1. Patient history

The patient was a 21 year old male who complained of a 6 year history of bilateral retropatella pain. Symptoms had developed

* Corresponding author. Tel.: +44 1332 254631.
E-mail address: Benjamin.smith3@nhs.net (B.E. Smith).

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insidiously over a number of months, remained unchanged for many years and were not associated with trauma or injury. The symptoms were intermittent, but ascending and descending stairs, rising from a chair, sitting for longer than 30 min and walking were consistently painful. Symptoms eased with rest, providing he didn't sit for longer than 30 min with his knees in a flexed position. Prior to developing the knee pain the patient participated in a variety of sporting activities, which he gradually withdrew from over the following 6 years. He worked as a shop assistant and did not partake in any regularly physical activity. He listed swimming and cycling as an activity he would like to return to, but cited high levels of pain, fear of making his condition worse and previous advice from multiple healthcare practitioners to avoid painful activities as reasons for being unable to participate in activities.

The patient saw an orthopaedic consultant 4 years prior, who diagnosed osteochondritis dissecans of the patella. The patient reported unchanged symptoms, and bilateral x-rays at that time showed nothing abnormal. He was advised to avoid activity and flexion of the knee greater than 90°, which the patient had diligently followed ever since. Previous physiotherapy treatment involved lower limb stretches, strengthening exercises and foot insoles, with very little benefit. He stopped wearing the insoles a number of years ago. The patient reported that previous healthcare practitioners had highlighted his poor foot position and muscle strength around the patella as causes of his pain. Specifically, his patella was mal-tracking as a result of these two factors causing a greater amount of stress behind the patella. The patient was fit and well with no medical history to note. He took Tramadol and Paracetamol as prescribed by his GP. He reported no locking or giving way of his knee.

2.2. Examination

Observation of the patient revealed comparatively normal gait pattern, posture, and lower limb alignment. His foot position was not formally measured, but was assessed as having a comparatively normal appearance. There was no pain at rest, and observation of the patient's knee revealed no swelling, bruising, or obvious bony deformity. A baseline examination showed the patient was able to fully flex and extend both knees. There was mild to moderate retropatella pain towards the end of physiological flexion. Patella position and movement was defined as normal during physiological range of movement testing of the knee. Palpation of the knee showed no pain on the patella tendon and no joint line tenderness. Repeated spinal movements did not reproduce any pain and there were no signs of red flags suggestive of systemic pathology or acute illness.

The assessment then moved its focus onto functional movements and pain provocation testing. With minimal pain, the patient was able to perform an active straight leg raise on each leg and a single leg balance on each leg. Squatting to 90° resulted in a small amount of pain. However, performing a sideways step down test (Loudon et al., 2002) 5 times caused moderate pain. During the step down test the patient required the use of 1 finger resting on a wall for support. At this stage it was felt the examination had reached the maximum possible level of functional testing, without exacerbating the patient symptoms, therefore the examination ended. The patient reported that on cessation of the step down test the pain was no worse than before the test. During the functional tests no specific structural testing such as muscle strength, muscle length, foot position, patella movement and position, or movement pattern was performed.

3. Evaluation

Following the examination process it was felt that the patient's signs and symptoms were consistent with PFP. He complained of pain when the patellofemoral joint was loaded. The patella tendon was not painful when palpated and he reported signs of fear and anxiety of movement and physical activity.

4. Intervention

The patient was taught to perform twice daily one uncomfortable/painful exercise as part of his rehabilitation programme. This was a modification of the step down test (Loudon et al., 2002); a single leg squatting exercise sideways on a step. By performing sideways the patient was able to use the guide of the wall and/or banister more easily. The exercise requires balance, knee extension strength, eccentric and concentric control and isometric hip strength. The patient was advised to exercise to the point of fatigue, through some manageable pain and discomfort.

Exercise progression and regression was advised to be guided by symptomatic response, such that on cessation of the exercise the pain should remain no worse than pre-exercise. The patient was advised to gradually increase the number of repetitions over a number of days and weeks. The patient was encouraged to self-direct their progression thus internalising the locus of control and moving towards self-management (Beinart et al., 2013).

Descriptions of tissue based pathology models of pain, *e.g.* patella mal-tracking, or limb mal-alignment were actively discouraged and challenged by the physiotherapist with pain described as 'de-conditioned' tissue. Education regarding pain models took up a large portion of clinical time, to address any beliefs or fear within the patient that pain is a sign of tissue damage (Moseley, 2007).

Self-management strategies in relation to exercise and skill acquisition, self-monitoring of progress and pain, dealing with flare ups and barriers to exercise and goal setting, were also discussed. Furthermore, the patient was advised to gradually return to his sporting activities (walking, cycling and swimming) with advice given on not to fear or avoid the pain. See Table 1 for main outcomes of the follow-up appointment. Appointments were scheduled approximately 2–4 weeks apart, working around the physiotherapist's and the patient's diary.

5. .Outcome

5.1. 19 week follow-up appointment

The patient was able to perform 30 single leg hops as his rehabilitation exercise on each leg. He reported being 80% better, was no longer taking painkillers and was able to attend kick boxing classes, cycle and walk pain free. At this point it was mutually agreed he should continue with his exercises long term and he was discharged.

6. Discussion

There is no consensus on the causes of PFP (Doménech et al., 2014), with multiple factors attributed in the development of pain and disability (Clijsen et al., 2014). Traditional assessment and treatments techniques are based upon tissue based pathology models of pain (Smith et al., 2015a) whereby musculoskeletal abnormalities and dysfunction are often assumed to affect the patella alignment, resulting in greater joint stress and the development of pain and dysfunction (Wilson, 2007; Barton et al., 2014; Clijsen et al., 2014). Structures that historically have been attributed as contributing factors include muscle weakness, soft tissue tightness, lower limb structural abnormalities, movement dysfunction and quadriceps mal-timing (Smith et al., 2015a).

Physiotherapy typically involves exercises and/or treatments aimed at reducing pain and correcting the assumed structural