Anterior knee pain– The enigma of the knee

GPs and physiotherapists are often faced with patients of all ages complaining of pain at the front of the knee. This is an extremely common problem, accounting for 25-40% of all knee related issues seen in a sports knee clinic. It can be very debilitating and is traditionally poorly treated.

Anterior knee pain syndrome (AKPS) describes a condition with many subtypes and has been called, amongst other things, patellofemoral pain syndrome (PFPS), chondromalacia patella, knee plica syndrome, and patella maltracking. The underlying problem with most of these patients is an imbalance in the muscular control of the kneecap as it engages and glides in the femoral trochlea groove. A basic understanding of the anatomy of the patellofemoral joint is useful to understand how patella facet overload occurs and why it should cause pain.

PRESENTATION

Most patients who present with anterior knee pain syndrome tend to be adolescents, but it also commonly occurs in middle age with early degenerative change of the patellofemoral joint. There is a misconception that more women than men are affected, but the incidence is the same in both sexes. Most are active individuals and will complain of diffuse pain at the front of the knee, typically whilst loading the knee in flexion during activities such as climbing stairs, walking up or down slopes, running and lunges.
They will also describe a form of 'start up' stiffness and pain, which is most noticeable after a period of immobilisation in a flexed position, such as a car journey, flight, or trip to the cinema or theatre. If the knee feels stiff and sore as they stand up, but quickly frees itself up, this is described as a positive 'cinema sign' and is very typical of AKPS. Patients can also complain of 'noisy knees' (crepitus and clicking) but do not typically suffer from swelling, joint line pain, or instability in sideways movements (although they may feel unstable on slopes).

PATHOPHYSIOLOGY

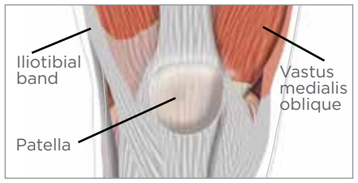
There are many factors contributing to the development of AKPS, including overall limb alignment, and local knee and pelvic factors.

It is recognised that abnormal local knee anatomy, such as trochlea dysplasia, can cause overloading of the joint, with stress response, cartilage wear and pain, however it is likely that a combination of structural abnormalities and poor biomechanics cause AKPS. Poor biomechanics include abnormal quadriceps firing patterns, with particular weakness of the medial quadriceps bulk - known as the VMO (vastus medialis oblique).

In women in particular, there is also increasing understanding of the role of abnormal hip adduction and internal rotation in the gait pattern (which must be addressed with rehabilitation). Studies suggest that gluteus medius activation in particular seems to be delayed and of a shorter duration in patients with AKPS. Increased tibial external rotation is also a common underlying problem, and when this can't be addressed with rehabilitation, it is one of the rare indicators that a surgical solution may be required to address the pain.

TREATMENT

Treatment is almost exclusively rehabilitation based, and patients rarely need a surgical opinion. Rehab must begin with a clear explanation about what is causing the pain. The patient's understanding is essential to ensure compliance with what is often a lengthy and frustrating process.
Whilst the joint anatomy cannot be altered, the control of that joint (the patella) can be. The patella tracking is controlled by tension in two main structures, the VMO and the iliotibial band (ITB), which act on the patella like the reigns on a horse. A tight ITB combined with a weak VMO pull the patella laterally, so it needs to be re-centred by easing off the ITB reign and increasing the pull by the VMO reign. This muscle strengthening and ITB loosening is essential to correct the biomechanics.



The rehab needs to be overseen by a sports physiotherapist, with the patient also doing exercises outside of the clinic. Exercises that focus on strengthening the posterolateral hip muscles are essential, as are open and closed chain kinetic exercises, foot orthoses and patellar taping. Stretching and deep friction massage to help loosen the ITB are also important.
These interventions are effective in the short term, but can take up to three months before noticeable improvements are made. Unfortunately 40% of patients relapse after a year, often due to neglect of the knee when returning to sport. In relapsed cases, one must be aware that as pain is the end outcome of this condition, it needs to be evaluated in consideration of other physical, psychological and lifestyle issues.

OTHER TREATMENTS

In the majority of patients, good quality rehabilitation for three months, sometimes with a change in lifestyle, will provide effective and long lasting relief. A small number of patients will need further investigation with imaging (e.g. MRI scanning) and possible radiological intervention or surgery. These interventions include steroid injection therapy, either into the knee itself or into the infrapatellar fat pad. The latter can be easily damaged by injury or surgery, and can cause pain from scarring or impingement.

Other modalities are being investigated, in particular the role of Botulinum toxin to relax tensor fascia lata and loosen the ITB. An injection of botulinum toxin into the muscle at the top of the ITB paralyses it for three months, giving a window of opportunity to work on strengthening the VMO and gluteus medius. This technique is producing encouraging results in patients who do not respond to more conventional treatments.

There is no role for simple arthroscopy or for isolated surgical release of the lateral patellar retinaculum as this can exacerbate the pain. These procedures are often performed in combination with either proximal or distal realignment of the patellofemoral joint however, to permanently alter the biomechanics of the joint, but only a small minority of patients will benefit from these interventions. ■

KEY POINTS OF ANTERIOR KNEE PAIN SYNDROME

1. This is a common but poorly understood condition, comprising of many subgroup conditions that all require the same treatment
2. A clear explanation to the patient is essential for compliance with treatment and a successful outcome
3. Investigation (via MRI scanning) is useful to exclude other treatable causes of knee pain, but rarely necessary in the presence of a typical history of a traumatic anterior knee pain
4. Treatment is always, in the first instance, rehabilitation with a sports physio. Compliance is essential
5. Referral to a knee surgeon or sports physician should be undertaken in the case of failed rehab or in the presence of any red flag signs and symptoms

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