



AUCKLAND BONE AND JOINT SURGERY

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ASSESSMENT AND REHABILITATION OF ANTERIOR KNEE PAIN

Introduction

Anterior knee pain, or pain at the front of the knee, is very common. This pain may be associated with a knee injury or may gradually develop over time, and is most commonly due to articular cartilage damage (joint surface damage) behind the patella (knee cap). Patients with anterior knee pain typically describe a relatively large zone of aching or burning pain over the front of the knee, which is worse with descending stairs, descending hills, sitting with a flexed knee, rising from a chair and with attempts at squatting. Intermittent sharp stabbing pain, night pain, and mild to moderate knee swelling may also occur.

Assessment of Anterior Knee Pain

Patients with activity-limiting anterior knee pain should contact their family doctor for an assessment. The physical examination is important, as specific clinical tests can indicate alternative diagnoses. Knee x-rays may show joint space narrowing (degenerative change) behind the knee cap (patellofemoral osteoarthritis), or may be normal. If the diagnosis is unclear, a referral to an Orthopaedic Surgeon for specialist assessment may be helpful. Magnetic resonance imaging (MRI) may be obtained, which typically demonstrates varying degrees of articular cartilage damage and joint surface thinning behind the patella and/or on the front of the femur (thigh bone) where the patella runs (trochlear groove).

Treatment of Anterior Knee Pain

Patients with anterior knee pain due to patellofemoral articular cartilage damage are usually best managed non-operatively. Frequently, the patellofemoral articular cartilage damage has been present for some time, and it is only the recent injury that has caused this damage to become symptomatic. Usually, the recent injury results in just enough loss of strength and muscle condition to push the patient into a deteriorating spiral of pain, causing loss of muscle condition, causing more pain, causing further loss of muscle condition, and so on.

Rarely, surgery may be required to treat focal areas of articular cartilage damage, however the mainstay of treatment for anterior knee pain involves physiotherapy and regular strengthening exercises for both the quadriceps and hip musculature.

Quadriceps Strengthening:

It is important to strengthen the quadriceps muscles (thigh muscles) while avoiding painful activities. Squats and lunges should be absolutely avoided, as these exercises put a great deal of pressure on the patella and will result in worsening pain.

The quadriceps are most effectively strengthened by using a stationary bicycle (exercycle), initially with a high seat (decreases the amount of knee flexion required) and with low resistance. The goal should be 20-30 minutes on the exercycle every 1-2 days. As the knee becomes stronger and more comfortable, the exercycle seat should be progressively lowered and the resistance can progressively be increased. In addition to strengthening, exercycle use can be considered to essentially polish the rough, painful surface of the patella to a more smooth, comfortable surface.

If patients have access to a gym, the seated leg press exercise machine, only allowing the knee to flex up to 40°, is also helpful.

Hip Muscle Strengthening:

Patients with anterior knee pain frequently have weak hip muscles. This may initially seem strange, but if the hip abductor and external rotator muscles are weak, the knee will tend to turn inwards as one walks, uses stairs, and squats, resulting in dramatically increased stress on the patella. By strengthening the hip abductor and external rotator muscles, the knee will remain aligned straight forward during activities, and the patella will remain in the perfect position with significantly decreased joint pressure and less pain.

Over the past ten years, a large number of scientific studies have proven that patients with anterior knee pain who strengthen their hip muscles in addition to their quadriceps muscles have much less pain and better function than patients who only strengthen their quadriceps muscles.

Patient Outcomes

Patients with anterior knee pain due to patellofemoral articular cartilage damage, with no other significant abnormalities, usually recover very well following a progressive physiotherapy and strengthening program. The best outcomes are seen when patients incorporate their strengthening program into their daily routine, in order to regularly maintain their strength and muscle condition throughout their life. Occasionally, patients will initially do very well with their strengthening program and then forget about their exercises. These patients often find that their anterior knee pain then returns, reminding them to return to their exercises, after which their pain will improve again.