CASE STUDY

A 32-year-old man with a long history of left knee pain

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Four specialists – a clinical psychologist, a physiotherapist, a pain specialist and an orthopaedic surgeon – each discuss their own particular aspect of the care of this young patient with ongoing knee pain.

Case scenario

Sean, aged 32 years, was diagnosed with Osgood-Schlatter's disease during his teenage years. He attended a local sports selective high school, during which he was a keen player of most ball sports. At 18 years of age he underwent knee arthroscopy after a painful soccer injury. He has long-standing left knee pain but is now trying to complete an apprenticeship as an automechanic, which he hopes to be able to continue with as both a job and hobby. Sean lives with his parents since his long-term girlfriend moved interstate for work.

Sean has an understanding boss who accommodates his disability. However, his functional capacity at work is severely limited by his inability to weight bear on his left knee due to pain that reaches a Visual Analogue Scale score of 8 out of 10 (where 0 is no pain and 10 is the worst possible pain experienced by the individual). He has been offered another operation on the strength of some ligamentous findings on MRI. He has come to see you, his GP, today to seek your opinion on future management.

Sean is distressed because of the pain and the duration and limitations that the pain has imposed on his ability to participate in the sporting activities that he once excelled at. He has now become solitary in his enjoyment of kayak fishing, but even that is limited by knee pain.

You ask Sean to fill out a pain assessment form as a baseline measure and for future reference. As well as indicating what makes the pain worse or better, this will also alert for any yellow flags (psychological markers that can be picked up by the pain descriptors chosen by the patient; see Sean's completed pain assessment form on page 32). This form can be completed by patients independently in the waiting room. You then review all the investigations carried out to date to ensure that rheumatological markers and red flags, which are indicative of serious illnesses including cancer and acute infection, have been excluded.

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Commentary from specialists

Q1. How much of this young man's pain has a psychological basis?

By Rob Schutze

Any clinically significant psychopathology (e.g. depression, anxiety disorders, substance-use disorders) should be assessed and treated with evidence-based interventions. Is there evidence of central sensitisation given his long pain duration? This will impact particularly on the need for management of stress/negative affect, as well as a paced approach to activity.

How is his mood and general emotional functioning? He seems not to have withdrawn from usual activities (e.g. work), which is protective against depression. He appears not to be too fear avoidant if he is persisting with work. Anxiety should be investigated nonetheless, both as a possible precursor and a symptom of longstanding pain. Stress is likely to be an issue, as is frustration and/or anger. Cognitive behavioural approaches could be used to address any of these forms of emotion dysregulation.

Existing pain coping strategies should be assessed, looking at aggravating and alleviating factors as well as pain self-efficacy (i.e. does he feel he can do things to effectively manage his pain?). Does he use active self-management strategies, which provide a better prognosis, or does he rely on passive treatments (e.g. medicines, surgery, manipulation, massage). The aim of psychological pain management would be to encourage active strategies, such as activity scheduling, relaxation exercises, cognitive restructuring (thinking helpfully), meditation and engaging social support.

Sean's activity style should also be assessed. He seems likely to be engaging in a boom–bust approach by overdoing it at work, making his knee pain flare up, which decreases his pain threshold over time. Instead, a paced return to normal activities might be explored to increase his tolerance over time.

Does the patient have a good understanding of biopsychosocial factors influencing pain perception? If not, psychoeducation (e.g. using the Explain Pain model)[1] would be indicated. If organic pathology is not the predominant driver of his pain and yet he holds largely biomedical beliefs about his pain then education will be important in motivating him to engage in other approaches.

In what ways has the patient's pain impacted his functioning? Structured problem solving may help to look at ways to overcome practical issues; supportive psychotherapy may be useful to allow the patient to express his frustrations and normalise his experience.

It is important to build on Sean's strengths by validating and encouraging positive behavioural responses, such as not withdrawing from work and hobbies. Environmental factors such as social support structures should also be assessed.

Q2. What physical therapies could be recommended?

By Corey Iskenderian

A patient with chronic knee pain and no recent mechanism of injury may well have negative beliefs regarding his disorder and have developed avoidance/protective behaviours that can lead to perpetuation of symptoms and physical deconditioning, resulting in more pain.

As indicated in the completed pain assessment form, it is the anterior aspect of Sean's knee that is painful, and the pain is provoked by standing, walking, including up and down stairs, and getting up from a chair (see Figure). Knowledge of the provoking factors will shape the examination and allow the assessment and management to be more targeted. Examination of Sean's tasks at work and his ability to perform them and his posture while doing so will allow a determination of his functional capacity, which is crucial for the setting of rehabilitation goals.

The articular, muscular/soft tissue and nervous systems should all be assessed and addressed in a patient with persistent pain and chronic injury. A biomechanical assessment of the tibiofemoral and tibiofibular joints should be carried out in Sean, assessing the position of the knee joint in static and dynamic situations (e.g. squat, one leg squat, gait) and determining whether any valgus or varus forces exist at the knee joint in each dynamic situation. Range of motion testing can determine the quality of movement and whether there is presence of crepitus or clicking.

Sean's foot position should be assessed. How do the ankle and subtalar joints in each leg behave during the different phases of gait, heel strike, mid stance phase and push off? When he squats, what happens at the ankle joint? Does it overpronate or underpronate? Does it demonstrate early heel lift, indicating shortened gastrocsoleus complex? Functional tests exist to determine the relation between the ankle and knee joint. Sean's hip joint, pelvis position in space and behaviour of the pelvis in gait should also be assessed as lack of motor control and strength in the hip can lead to lower back and knee pain.

Sometimes a person's pain experience is enhanced by a nerve entrapment in the lumbar spine. A full neurodynamic testing should be carried out in Sean, starting with the lumbosacral plexus. Entrapment of the saphenous nerve (a cutaneous branch of the femoral nerve) can happen at the level of the adductors and vastus medialis muscle groups and can contribute to sharp pain in the medial tibiofemoral joint line.

Review of radiology may identify potential sources of pain. What were the ligamentous findings on Sean's MRI? Is there medial collateral ligament and lateral collateral ligament thickening or tears? How is the chondral surface at the femoral condyles and tibial plateaus? There may well be some degenerative changes from the knee trauma and arthroscopic repair earlier in his life.

Once a clinical picture has been built, a specifically targeted rehabilitation program can be created.

Myofascial treatment that addresses the various functional fascial slings connecting the trunk to the lower limbs may improve Sean's mobility in the different positions he adopts to fulfil his occupational tasks. This therapy relaxes muscle tension that can lead to joint compression and consequent increase in point sensitivity.

General conditioning and improvement

Date *9/10 /2013*

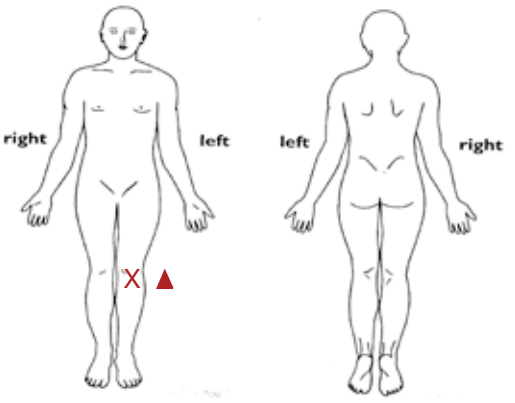
Surname *L.* **First Name** *Sean* **D.O.B.** *15/6/1981*

Q1 Please rate the pain on the scale below from 0 to 10.
With zero = NO pain, and 10 the worst possible pain YOU have ever experienced

No pain 0 1 2 3 4 5 6 7 (8) 9 10 worst pain imaginable

Q2 **Mark <u>all the areas</u> on your body where you feel pain or abnormal sensations, using the symbols below.**

Numbness **O**	Pins & Needles ●	Ache **X**
Cramping ▯	Burning ▲	Stabbing **+**



Q3 **Please <u>circle</u> those words below that fit the description of your pain:**

shooting	(stabbing)	sharp	cramping	gnawing	(hot/burning)
(throbbing)	aching	pulling	dull	heavy	tender
tight	splitting	(tiring – exhausting)	sickening	fearful	(punishing)
(cruel)	terrifying	nauseating	(agonising)		

Please <u>tick</u> one of the following boxes:

How long have you had this pain? ❑ days ❑ months **X** years
Is it constant? **X** yes ❑ no
When is your pain at its worst? X morning X noon X night
What makes your pain feel better? ❑ pills ❑ potions ❑ lotions

Specify *Nothing much*

What <u>treatment/s</u> have you undertaken for the pain?

❑ acupuncture X physiotherapy ❑ TENS X hydrotherapy
X massage ❑ meditation/relaxation ❑ other *please specify* _____

Which of the following activities makes your pain worse?

❑ lying ❑ sitting X getting up off a chair X standing
X walking X climbing stairs X walking down stairs ❑ Other *please specify*

_____

What is the most important thing that this pain stops you from doing?

Can't get under cars to work as I'm frightened that I won't be able to get up again!

Figure. Sean's completed pain assessment form.

of trunk control could help Sean regain confidence in his body and accomplish the demands necessary to fulfil his job's requirements. A strengthening program designed to optimise the hip extensors–quadriceps and hamstring–quadriceps ratios could also be of value here. Does Sean wear orthotics in his shoes? Although the research is inconclusive at this stage, their use might be worth trialling in an attempt to realign his foot and ankle should he have overpronation.

Q3. What medications might be considered and for how long?

By Stephan Schug

The role of medication in a patient with such a long-standing pain problem may be limited, but could possibly improve quality of life and functional capacity. This could enable better participation in the physiotherapy approach suggested above.

As the patient describes exacerbation on weight bearing, there may well be an ongoing nociceptive contribution to his pain. It would therefore be worth trialling paracetamol 4 g per day for a limited time to assess its effect; ideally this should be assessed by reporting physical function and pain in a diary to identify improvement. Should such a trial be beneficial but insufficient for the patient's needs, then a trial of NSAIDs is appropriate. Options here would be simple NSAIDs, such as naproxen or ibuprofen, with the dose titrated to effect; the lowest dose for the shortest period is recommended. The patient is young and presents with no specific risk factors; however, even in such a setting, a coxib would offer a slight safety advantage and could be considered. This would especially be the case if the trial of a coxib was successful and long-term medication were needed. The alternative of combining a nonselective NSAID with a proton pump inhibitor is overall inferior, and proton pump inhibitors carry additional adverse effects.

As this long-standing pain will potentially have a neuropathic component and/or central sensitisation processes as a contributing factor, consideration should be given to a trial of pregabalin or a tricyclic antidepressant in very low doses. If tricyclic antidepressants are not tolerated, a serotonin and noradrenaline reuptake inhibitor, such as duloxetine or venlafaxine, should be tried. All these medications aim to strengthen descending inhibition of pain or reduce central facilitation of pain signals.

In view of the longstanding problem and the young age of the patient, the introduction of opioids should not be considered. However, centrally-acting analgesics with a low affinity to the opioid receptor (and thereby reduced risk of typical consequences of opioid exposure), such as tramadol or the recently registered tapentadol, might be worth a short-term trial to complement the medications listed above. These medications can contribute to improved descending inhibition by their additional effect on noradrenaline reuptake inhibition (tapentadol) or this mechanism plus serotonergic effects (tramadol).

Q4. Will an orthopaedic intervention at this stage alleviate the chronic pain perceived in the knee?

By Leo Pinczewski

The history obtained of Osgood-Schlatter's disease in the teenage years, arthroscopy after a painful soccer injury at the age of 18 years without diagnosis and a 16-year history of ongoing knee pain is unusual. Osgood-Schlatter's disease is a traction injury to the tibial tubercle epiphysis, and once growth ceases, apart from a residual lump, there are no ongoing symptoms that are accompanied by significant disability.

The history of a painful soccer injury and arthroscopic surgery followed by continuing disability can be attributed to either a ligamentous disruption (such as to an anterior or posterior cruciate ligament) or an articular cartilage defect that has progressed to premature osteoarthritic change.

Given the severity of pain and disability this patient describes at the age of 32 years, further orthopaedic investigation is indicated, including:

- retrieval of the arthroscopic records from 14 years ago
- weight-bearing radiographs of the lower limbs, in particular, the affected knee
- a total body bone scan with SPECT views of abnormal uptake areas
- review of the MRI scan of the knee. A repeat MRI could be considered depending on quality and date of the last scan.

A diagnosis needs to be made before any surgical intervention. The offer of an arthroscopy on the strength of some ligamentous findings on MRI scan is unlikely to resolve the patient's pain as ligament pathology generally results in the symptoms of instability. If a diagnosis to explain the cause of the patient's pain cannot be made, then a rheumatological assessment and psychological evaluation is required.

To answer the question of whether an orthopaedic procedure at this stage will alleviate the chronic pain perceived in the knee revolves around whether a significant pathology such as a bone-on-bone articulation in a single compartment secondary to prior injury is present. In such cases, an osteotomy to unload the arthritic compartment has an excellent chance of relieving symptoms and returning the patient to a pain-free and productive life. In the absence of clear organic pathology, any well intentioned but hopeful surgery is usually accompanied by a deterioration of symptoms. In such cases, despite the desire to help the patient, they are best served with a nonoperative approach and consultation with our colleagues – rheumatologists, sports medicine physicians and pain physicians. **PMT**

Reference

1. Butler DS, Moseley GL. Explain pain (2nd ed.). Adelaide: Noigroup Publications; 2013.

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