Case Report

Unlocking a locked knee by ultrasound guided anesthetic injection

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ABSTRACT

Twenty-three-year old male patient with a background of mild cerebral palsy (with limited effect on mobility) presented with 36 hours history of pain on the lateral aspect of his left knee. On examination his knee was locked and there was no associated history of trauma. A detailed MRI scan required in extension and unlocked leg to elucidate the cause. This was achieved by administration of local anesthetic under ultrasound guidance to the lateral aspect of the knee with successful results.

This case is important as it looks at minimally invasive management of the acutely locked knee prior to more detailed imaging. Pseudolocking of the knee is a well-known cause of knee locking. Performing a magnetic resonance imaging (MRI) scan can diagnose cases of pseudolocking can prevent unnecessary intervention such as arthroscopy. In our case, the orthopedic team was reluctant to take the patient to theatre without more detailed imaging, given his medical history. There are very few case reports in the literature which address this issue and there is no case in the literature using this technique in cerebral palsy with muscle spasm.

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Case Presentation

Twenty-three-year old male presented with 36 hours history of pain on the lateral aspect of his left knee and locking of his knee at 50° flexion, without any known trauma. The patient had a background of cerebral palsy, with limited effect on mobility. Clinically, there was tenderness and tightness over the lateral soft tissue structures of the knee. The attempt of unlocking under sedation, IV morphine, and nitrous oxide failed by orthopedic team. The patient had a plain film, which
showed no evidence of fracture or joint effusion, however was unable to explain the patient’s symptoms (Fig. 1a and 1b).

To fully evaluate the cause for the patient’s symptoms, an magnetic resonance imaging (MRI) scan was required prior to arthroscopy, as it has an important role to plan the management and exclude pseudolocking [2]. Since most common cause of true knee locking is meniscal tear [2,6] and since there is limited experience in reporting knee MRI in flexion in our practice, the MRI scan would be preferably done in extension position rather than flexion [3]. The flexion of the knee at 50° presented a technical challenge in order to attain a diagnostic detailed scan.

**Treatment**

There is limited literature about the management of acute locked knees without attempt of “manipulation under anaesthesia” followed by arthroscopy if required. It is widely accepted that MRI scans should be performed in this situation prior to any interventions as it can help elucidate whether conservative management is an option [1,2]. To help achieve a diagnostic detailed MRI scan in extension, we trialled a method of using local anesthesia under ultrasound guidance.

We performed an ultrasound (US) scan of the patient’s left knee, which showed evidence of significant tightening of the biceps femoris tendon insertion to the fibular head, with associated tendinopathy. There was also tightening of the iliotibial band proximal to its insertion into Gerdy’s tubercle. The patient was tender to probe palpation. There were normal sonographic appearances of the patellar and quadriceps tendon and no significant joint effusion [Fig. 2a, 2b, and 2c].

We concluded that the locking of the knee was exacerbated by the tight or overactive biceps femoris tendon and iliotibial band, which may be secondary to the underlying cerebral palsy. This would be an example of pseudolocking, which may be due to muscle spasm, synovitis, plica synFidrome, or patellofemoral disease including maltracking of the knee [1]. However, to ensure there was no organic cause of “locking” the MRI was deemed necessary. We discussed the option of trialing local anesthetic to help relax the iliotibial band and biceps femoris tendon, and also to help with symptomatic relief and the patient consented. Under ultrasound guidance and aseptic technique 10mL of 1% lignocaine and 20mL of 0.5% levobupivacaine were administered around the tendon insertion, and also along the iliotibial band. This helped to relieve the pain and the patient could relax his muscle. This facilitated us to unlock his knee in prone position in the ultrasound room. There were no immediate complications. After the procedure, not only was the patient pain-free, he was also able to fully extend his leg and successfully go on to have his MRI scan.

The MRI scan was performed exactly 24 hours after the US and showed that there was a bucket-handle tear of the lateral meniscus, with the torn fragment lying anterior to the anterior horn on the anterolateral aspect of the intercondylar notch [Fig. 3a, 3b, and 3c]. Fluid was noted superficial to the iliotibial band and biceps femoris [Fig. 3c], which is likely secondary to our ultrasound-guided intervention. The patient subsequently had an arthroscopic meniscectomy and was later discharged to physiotherapy.

**Discussion**

Here we attempt to describe a “bail out case” for patients with acute locking of the knee prior to MRI scans. The MRI scan is the imaging modality of choice for assessment of patients with knee pain and locking prior to arthroscopic involvement, as it can help determine, which cases may be managed conservatively [2]. The most common cause of knee locking is meniscal tear, for which MRI in extension is preferable. In addition to the fact that we always report knee MRI in extension, with
no good experience of reporting MRI knee in flexion. We were able to achieve that by using a minimally invasive US guided local anesthetic injection.

This is not something that has been widely trialed and as such there is limited literature on this topic. The closest thing we were able to identify was a case in the literature where local anesthetic was administered for a locked knee was a case of a 53-year-old lady who actually had a hyperextended knee secondary to superior patellar dislocation. She was unable to flex the knee. In this case local anesthetic was administered, which allowed for gentle reduction without the need for surgical intervention [4]. There is also a case of a 13-year-old boy, who presented with pseudolocking of the knee, thought to be secondary to a hamstring spasm and synovitis, which resolved under general anesthesia [5].

US guided local anesthetic administration may be helpful for other such cases whereby more detailed imaging cannot be performed owing to flexion or hyperextension of the knee and other conservative measures were not successful. This should be considered as a minimally invasive bail out technique.

Fig. 2 – (a, b, and c) US images of the lateral soft tissues of the right knee. Figures b and c showing local anesthetic injection around the biceps tendon and iliotibial band under US guidance.

Fig. 3 – (a, b, and c) Sagittal and coronal MRI of the normally extended right knee showing the bucket handle tear of the lateral meniscus.

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