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Chronic Anterior Knee Pain in a Wrestling Athlete from a Neuroma of the Infrapatellar Branch of the Saphenous Nerve

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INTRODUCTION

Anterior knee pain is the most common knee complaint presenting to primary care and orthopaedic offices.[1] Many cases are chronic and are not related to a specific precipitating injury or trauma.[1,2] Knee pain due to a neuroma is not a common cause of anterior knee pain, and as such is ill defined in medical literature.

There have been few case reports identifying painful neuromas from the infrapatellar branch of the saphenous nerve (IBSN) as a cause of chronic pain in patients.[3-5] The saphenous nerve is a division of the femoral nerve. It divides into the main saphenous branch and the IBSN. Anatomic models show the IBSN crossing the anterior knee below the patella and dividing into three branches eventually combining to form the patellar plexus.

The IBSN is a pure sensory nerve. This nerve may be injured through direct trauma[6-9] or surgical procedures such as knee arthroplasties and arthroscopic procedures.[3-5,10] In some cases, patients may have pain without significant known trauma.[11] Previous case reports have identified this in older patients post-surgically.[4,12] This report presents a case of a neuroma causing chronic anterior knee pain in a high school athlete, which to our knowledge is the first reported case in the literature.

CASE REPORT

A 17-year-old male presented for evaluation of a six-month history of right knee pain. The patient, a high school wrestler, stated that the pain began after he landed directly onto his knee. The pain was located on the anterior medial aspect of the knee, occuring specifically with wrestling activities. He characterized it as a severe, burning pain only with kneeling, sometimes associated with a shocking and shooting sensation directly over the affected area without radiation of pain. He denied any mechanical symptoms of locking, catching, or giving way and there was no pain with walking, running, or at rest. The patient was unable to wrestle effectively due to pain.

Before presenting to our clinic, the patient had been evaluated by two outside orthopaedic surgeons and had already undergone the following imaging and procedures:

1. On initial evaluation in 2017, a small extra-articular mass at the medial border of the patella was palpated. A palpable painful fibroma within the prepatellar bursa was presumed to be the source of the pain per the outside physician. Plain film radiographs were unremakable; no further imaging was obtained. The patient underwent prepatellar bursa resection and excision of the tender fibroma. The pathology report demonstrated dense fibrosis and fibroadipose tissue with focal reactive changes and reactive vascular proliferation with mild inflammation. Following the procedure, he completed a course of physical therapy.
2. Three months following the above procedure, there was no improvement and patient was evaluated by a second orthopaedic surgeon. An MRI demonstrated mild edema of the subcutaneous tissues anterior to the knee, thought to be postsurgical, as well as a tibial tubercle non-united ossicle that was deemed to be an incidental finding corresponding to his previous history of Osgood-Schlatter disease. The MRI was otherwise unremarkable. A diagnostic arthroscopy was performed, identifying a small chondral injury measuring 8 mm x 9 mm along the medial margin of the medial femoral condyle which roughly corresponded to the location of the pain. A chondroplasty was performed, but there was no improvement of the pain after 10 weeks.

The patient presented to our clinic seeking a third opinion for his knee pain. At the initial visit, a diagnostic supra-patellar, landmark-guided intra-articular injection with 4 ml lidocaine and 3 ml ropivacaine was performed. The patient did not obtain any relief from the injection, thus suggesting an extra-articular cause of his pain unrelated to the chondral lesion that was noted on previous arthroscopy. At that time, patient opted for a trial of conservative management with topical analgesics, including 1% topical diclofenac gel and lidocaine patch.

At one-month follow-up, the patient reported no change in his pain despite using the topical analgesic. Stardard knee exam was benign without focal tenderness. His pain was reproduced by having him kneel in the exam room. Once the area of pain was localized, physical exam revealed point tenderness and a subtle mass that was located medial to the patella, only noted with the knee flexed past 90 degrees. The palpable, painful, fibrous-like band reproduced the pain. A landmark-guided soft tissue injection was performed at the site of palpable pain using 0.5 ml of 1% lidocaine and 20 mg of triamcinolone. However, this injection did not relieve pain significantly and he was referred to an orthopaedic surgeon for resection of the mass that was thought to be a neuroma or scar tissue (Figure 1). No repeat imaging was ordered, but the recent MRI from 3 months prior to presentation and the arthroscopy procedure dictation from 2 months prior were reviewed.

The patient underwent a third surgery on his knee, diagnostic arthroscopy, and a plan for resection of the possible neuroma. An incision was made directly over the painful band over the medial femoral condyle and it was dissected to where the band could be palpated. There appeared to be an IBSN neuroma. This was dissected back and resected.

At two weeks post-operatively, the patient reported significant improvement in his pain. At the six-week follow-up, his wound was healed and he was able to progressively resume full activities. Since then, he has been able to continue his wrestling career at the collegiate level.

Figure 1. The subtle painful fibrous mass at the medial knee was palpable only with the knee in deep flexion.

DISCUSSION

There is a wide differential for chronic anterior knee pain in the student athlete. Common causes of knee pain can be due to patellofemoral pain, ligamentous or meniscal injuries, osteochondral lesions, infrapatellar bursitis, Hoffa syndrome, Osgood-Schlatter disease, patellar or quadriceps tendonitis, or tendinosis.[13] It is important to differentiate between intra-articular and extra-articular causes of pain. Knee pain as a result of a neuroma from the IBSN is an extra-articular manifestation. Post-surgical causes of neuromas of the IBSN have been described better than traumatic causes.

In a review of two cases from motor vehicle accidents after a dashboard injury, no neuromas were identified, but neurolysis of the IBSN provided immediate resolution of pain.[5] Another review of five cases of neuralgia from direct trauma to the anteromedial aspect of the knee that failed conservative treatment, achieved complete resolution of pain from neurolysis of the IBSN.[14]

In a review of surgical cases, there have been many identified cases related to arthroscopy, anterior cruciate ligament reconstruction with hamstring graft harvesting, and total knee arthroplasties. In respect to patients who had total knee replacements with persistent neuromatous pain who had failed conservative therapy, Dellon et al.[3] reported significant pain relief in 60 out of 70 patients who proceeded with selective denervation. There are few reports describing neuromas of the IBSN secondary to knee trauma.[7-9] To our knowledge, there are no reported cases in a student athlete.

Detailed history and careful physical exam may be able to identify a specific area of pain to elucidate pain coming from the IBSN. Trigger point injections may identify the pain as a report from Grabowski et al.[15] demonstrated the use of lidgnocaine, providing at least two weeks of pain relief. However, in our patient, the trigger point injection did not result in any subjective relief of the pain at the time of injection of local anesthetic nor in the weeks post-procedure in response to the corticosteroid. Failure of trigger point injection does not rule out pain from the IBSN and that neurolysis or surgical exploration and resection is an appropriate next step. Another consideration would be to order additional imaging such as MRI or musculoskeletal ultrasound if no recent images were available.

CONCLUSION

There have been few case reports identifying painful neuromas from the infrapatellar branch of the saphenous nerve (IBSN) as a cause of chronic anterior knee pain in patients. This case report presented a high school wrestler with a symptomatic IBSN neuroma that was resected successfully and allowed him to return to wrestling.

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