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Semimembranosus tenosynovitis: Diagnosis and management of a commonly missed cause of posteromedial knee pain

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ABSTRACT

Background: In orthopedic and sports medicine literature there is minimal information regarding accurate diagnosis and the treatment options for tenosynovitis of the distal semimembranosus tendon. After reviewing the literature, the authors question both the etiology and treatment of this condition. Previous descriptions have associated the condition primarily with the endurance athlete but we have noted multiple cases in which this is a condition common to the 'sprinter' as well. There has been very little mention of this condition in recent literature but the most recent complete description of operative treatment for this condition recommends both tendon transfer and concomitant arthroscopy. We propose this condition is akin to De Quervain's tenosynovitis of the knee, with sensitive and specific signs on physical examination.
Methods: We describe a case series of six cases (five patients), that underwent open surgical release for semimembranosus tenosynovitis. The anatomy and the treatment options for the condition are also discussed.
Results: At a follow-up period of 18–64 months, all cases showed improvement in the Tegner activity score following surgical release.
Conclusion: Diagnostic confusion can be decreased with more modern diagnostic imaging modalities than those described in the literature. The authors outline an alternative operative approach significantly decreasing surgical complexity and therefore post-operative morbidity.
What is known about this subject: This is a rare condition and the surgical treatment is seldom performed.
What this study adds to existing knowledge: We describe the technique for surgical decompression and reveal positive results at medium term follow-up.

1. Introduction

The orthopedic and sports medicine practice of the senior author is based in a major metropolitan area with a healthy and very active population. A significant number of patients with non-traumatic knee pain are treated every year. The senior author has had experience of patients with medial knee pain due to semi-membranosus pathology and which is recalcitrant to conservative treatment. In a similar experience described by Ray et al., a significant number of patients with this condition were treated

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over a five year period [6]. They suggested that this condition was common to the "recreational endurance" athlete particularly in the middle-aged population. Additionally, they defined this condition as a tendonitis of the tendon substance [6].

Review of patient history, clinical examination findings, and operative findings at the time of surgery are more consistent with and more accurately described as a tenosynovitis or "De Quervain's syndrome" of the knee. Our patient population does not suggest a preponderance of either endurance athletes or the middle aged, but rather an equal distribution of young and the middle aged, with recreational and high level sprinters and endurance athletes all being affected. However, one commonality that seems to be more frequently associated with this condition is running.

The aim of this paper is to more accurately define this clinical and pathologic entity as semimembranosus tenosynovitis. The common presenting complaint is variable but persistent pain at the postero-medial aspect of the knee just distal to the joint line. Pain is notably exacerbated by activity, particularly with repetitive flexion and extension of the knee in activities such as running or walking. Pain generally reduces with rest but does not resolve. A boggy swelling at the posterior medial knee may be described, but this condition is not associated with a knee effusion in the absence of intra-articular pathology. Our experience suggests that a careful clinical examination is of paramount importance in ascertaining the correct diagnosis. Postero-medial pain with this condition can easily be misconstrued as joint line tenderness associated with medial meniscal pathology. As such strict attention should be paid to precise isolation of tenderness on exam.

Finally, conservative management of this condition is well established. Our patient population was treated accordingly with a combination of treatment strategies. These ranged from simple rest from aggravating activities to suspension or alteration of training (in the case of elite athletes), anti-inflammatories, use of formal physiotherapy modalities including gait analysis, stretching exercises, ultrasound and iontophoresis and local anesthetic and/or corticosteroid injections. Operative intervention was considered indicated only after patients failed to respond to non-operative treatment modalities.

We describe a series of five patients with a confirmed diagnosis of semimembranosus tenosynovitis, who were treated at a single center. In one patient the diagnosis was bilateral. Internal audit approval was granted and ethical approval was not required.

2. Anatomy

The tendon of the distal semimembranosus has a complex distal insertion. There is a principle insertion into the horizontal groove at the postero-medial condyle of the tibia approximately one centimeter distal to the joint line. There is also a series of complex secondary attachments (via fibrous expansions and capsular thickenings) to the medial collateral ligament (MCL), superficial medial fascia and distal tibial expansion, the coronary ligament of the medial meniscus, the posterior oblique and oblique popliteal ligaments as well as to the proximal posterior capsule. Laprade et al. [4] described the bifurcation of the distal semimembranosus tendon into a main common tendon 11.9 mm wide and a thick anterior expansion which inserts deep to the proximal tibial attachment site of the superficial MCL. These multiple attachments are separated from the surrounding structures by a complex bursa which is distinct from the bursa of the pes anserinus [4]. The semimembranosus bursa envelopes these tedious attachments and expansions. The bursal tissue and deep investing fascia surround the complex distal insertion of the tendon. It is the release and excision of this 'sheath' that decompresses the tendon in the operative technique described here.

3. Diagnosis

Unlike De Quervain's tenosynovitis of the wrist, this tenosynovitis of the distal semimembranosus tendon is often less "accurately" or "classically" described by patients upon initial presentation. This is likely caused by the relative change in position of the course of the semimembranosus tendon as the knee goes from extension into flexion from near the postero-medial joint line to a more posterior and inferior position. Additionally, it appears to have an insidious onset resulting in a chronic complaint usually without a history of trauma. Patients commonly describe pain at the medial or postero-medial joint line as a diffuse ache exacerbated by running or increased activity. Importantly, patients do not describe symptoms of a knee effusion as this is not associated with the condition unless complicated by other intra-articular pathology. Patients may describe an area of isolated swelling at the postero-medial knee that should be distinguished from a knee effusion and from bursitis of the pes anserinus or of the medial head of gastrocnemius.

After careful attention to a patient's description of symptoms, careful and precise physical examination can then accurately direct the diagnosis. The differential diagnosis is relatively short, but critical to understand when attempting to accurately make the diagnosis (Table 1). Careful clinical examination will often reveal tenderness specifically along the course of the semimembranosus tendon. This should be distinguished from meniscal or joint line tenderness by palpating the tendon with the knee in extension then in flexion. As the knee is flexed the tenderness should follow the course of the tendon posterior as it becomes a relatively more posterior structure to the knee in flexion. Careful attention should be paid to tests for an effusion as none is expected with this condition. However, localized area of boggy extra-articular swelling can sometimes be palpated along the course of the tendon.

Diagnostic confirmation is likely to be required with imaging modalities after the clinical examination. Halperin et al. [3] suggested an association of semimembranosus tendonitis in middle aged and older patients with medial osteophyte formation leading to an attrition effect. This has not been the experience of the authors of this paper. Previous literature advocated use of nuclear imaging bone scan to confirm the diagnosis when in question [6,5]. Since Ray et al.'s paper, ultrasound and magnetic resonance imaging (MRI) have advanced significantly in their diagnostic capabilities and are excellent adjuncts should the diagnosis remain in question [1,2]. A bone

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