



## Case Presentation

# Successful Treatment of Athletic Pubalgia in a Lacrosse Player with Ultrasound-Guided Needle Tenotomy and Platelet-Rich Plasma Injection: A Case Report

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## Abstract

Athletic pubalgia is a syndrome of persistent groin pain due to chronic repetitive trauma or stress involving the pelvic joints and many musculotendinous structures that cross the anterior pelvis. As a result, the differential diagnosis can be complex, but insertional tendinopathies are the most common. This case report describes a novel approach to the treatment of distal rectus abdominis tendinopathies with ultrasound-guided needle tenotomy and platelet-rich plasma (PRP) injection. After injection, the patient returned to pain-free play at his previous level of intensity. This suggests that PRP may be a useful treatment for this diagnosis.

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## Introduction

Athletic pubalgia is a syndrome of persistent groin pain due to chronic repetitive trauma or stress involving the pelvic joints and many musculotendinous structures that cross the anterior pelvis. It occurs most commonly in sports that require sudden changes in direction or intense twisting such as soccer, hockey, rugby, skating, fencing, cross-country skiing, basketball [1], and lacrosse. The etiology often involves abnormal or imbalanced movements at the hips, pelvis, or lumbosacral spine. The mechanism of injury is chronic tensile overload with repetitive microtrauma. In the majority of cases, the pathoanatomical structures responsible for symptoms of insertional tendinopathy at the anterior pelvis are the distal rectus abdominis or hip adductor group [2]. Other, less common, causes of pelvic pain in athletes include osteitis pubis and "sportsman's hernia" (disruption of the posterior abdominal wall).

Initial treatment of insertional tendinopathy of the hip adductors or the rectus abdominis consists of rest, ice, oral nonsteroidal anti-inflammatory drugs (NSAIDs), and physical therapy. Therapeutic exercises should aim to restore normal range of motion and correct abnormal shear across the pelvis generated by relative weakness of any of the major muscle groups attaching there,

including hip flexors, hip extensors, lumbar extensors, trunk flexors, hip adductors, or hip abductors. Once a relatively weak muscle group is identified, an eccentric strengthening program can be beneficial [3]. Any tight muscle groups should also be targeted in a stretching program to minimize any compensatory adaptations that could lead to additional injuries. If symptoms fail to improve with conservative measures, injection of the tendon sheath and enthesis with corticosteroids may be considered [4], and, in cases of sportsman's hernia, early surgical intervention may be recommended [5].

Previous reports have suggested a role for platelet-rich plasma (PRP) in the treatment of lateral epicondylitis [6-11], patellar tendinopathy [12,13], Achilles tendinopathy [14], and rotator cuff tendinopathy [15,16]. Given its reported success in the treatment of pathologically similar conditions, the authors considered PRP as a reasonable treatment option in an elite athlete who was otherwise not able to return to competition.

We report a case of athletic pubalgia due to distal rectus abdominis tendinopathy that was treated with targeted ultrasound-guided PRP injection and tenotomy, with complete resolution of symptoms, and we discuss the potential roles and advantages of this technique.

## Case Presentation

A 20-year-old male Division I collegiate lacrosse player presented with a 1-year history of gradual onset lateral left hip pain with a positive “C-sign” and groin pain that intermittently radiated to the left testicle. At the time of his evaluation at our center, he had already been diagnosed with a left hip labral tear based on clinical examination, magnetic resonance imaging (MRI) findings, and a positive response to an intra-articular left hip injection with corticosteroid and anesthetic. He subsequently underwent arthroscopic labral debridement. Postoperatively, his left antero-lateral hip pain improved; however, his groin pain persisted. This was despite treatment with NSAIDs and injection with corticosteroid and anesthetic to the pubic symphysis that was performed before evaluation at our institution and a total of 12 months (6 months postoperatively) of an active rehabilitation program. The rehabilitation program was conducted under the supervision of his athletic trainer, and included range of motion exercises for the hip and lumbar spine as well as eccentric core and lower extremity strengthening. The patient made small gains and was relatively pain free at rest; however, his symptoms worsened with activity, limited his ability to practice, and prevented participation in competition. He denied having any back pain.

Examination revealed tenderness at the insertion of the distal rectus abdominis muscle at the margin of the left pubic symphysis that reproduced his characteristic pain. There was no tenderness overlying the lumbosacral spine, paraspinal musculature, or sacral sulcus. Internal rotation of the hip was 10° on the left and 20° on the right. Strength, sensation, and reflexes were all normal. Flexion, abduction, and external rotation (FABER) of the left hip and resisted left hip adduction both elicited mild ipsilateral groin pain, but were not his typical sport-limiting symptoms and, when tested on the right, were normal. Straight leg raise and seated slump, Gaenslen, thigh thrust, and gapping test results were all negative bilaterally.

Radiographs of the hips revealed a small cam lesion on the left and were otherwise unremarkable. MRI before his left hip labral debridement demonstrated the following: 1) a central fluid cleft along the articular disk of the pubic symphysis; 2) increased signal along the insertion of the left rectus abdominis when compared to the right; 3) marrow edema within the right parasymphyseal pubis; 4) an antero-superior left acetabulum labrum tear (since debrided); and 5) disk protrusions at L4/5 and L5/S1 (Figure 1). Given the left-sided rectus abdominis MRI findings and the patient’s persistent postoperative left-sided pain and tenderness at the insertion of this muscle at the pelvis, a diagnosis of distal rectus abdominis tendinopathy was made. The authors postulate that altered biomechanics due to a

tendinopathic and relatively weakened left rectus abdominis muscle may have contributed to increased shear at the pubic symphysis and resulted in the observed marrow edema on the asymptomatic right side. The lumbar disk protrusions were not believed to be symptomatic.

Given the patient’s poor response to an appropriate rehabilitation program and conservative medical management, 2 surgical consultations were obtained for possible sportsman’s hernia repair. Both surgeons recommended that he continue nonoperative treatment. At this point, the authors believed that additional therapeutic exercise was unlikely to return the athlete to play. The risks, benefits, alternatives, and limited evidence for ultrasound-guided needle tenotomy and PRP injection of the left distal rectus abdominis muscle were discussed with the patient, and he provided informed consent for this procedure.

The PRP procedure was conducted as follows. First, 52 mL of peripheral whole blood was withdrawn from the patient into a syringe containing 8 mL of Anticoagulant Citrate Dextrose–Formula A, resulting in a final volume of 60 mL that was processed with a Magellan Autologous Platelet Separator (Arteriocyte Medical Systems, Cleveland, OH) according to the manufacturer’s instructions, to produce 5 mL of leukocyte-rich platelet-rich plasma. Then, with the patient supine, the skin overlying the pubic symphysis was prepared and draped in the usual sterile fashion before being anesthetized with 1% lidocaine. Next, a 22-gauge, 3.5-inch spinal needle was advanced under ultrasound guidance (M-MSK Ultrasound System, SonoSite, Inc, Bothell, WA) using a high-frequency linear transducer (HFL50x/15-6 MHz, SonoSite, Inc, Bothell, WA) with the needle in-plane (ie, longitudinal or long axis) relative to the transducer and tendon fibers in a cephalo-caudad manner through the skin and left rectus abdominis tendon to its insertion at the pubic crest between the pubic tubercle and the pubic symphysis. Needle tenotomy was then performed, and a total of 5 mL of autologous PRP was injected in 2 aliquots at the tendon insertion near the pubic crest and the musculotendinous junction. Adequate distension of the tendon and muscle was visualized at that site (Figure 2). The needle was then removed and a sterile bandage was applied. The patient tolerated the injection well. He followed the postprocedure rehabilitation guidelines outlined by Finoff et al [17], with the modification that he was permitted to advance the program more rapidly if he was able to perform all activities at the current level without significant pain.

Four weeks postinjection, the patient had 0/10 pain, and there was no tenderness at the pubic symphysis. By 6 weeks postinjection, he was given clearance to begin sport-specific training and modified practice under the supervision of his athletic

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