Nonoperative Treatment of Psoas Tendon Avulsion in a Professional Athlete

A Case Report and Evidence Based Review

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Abstract

Case: A 36-year-old male professional soccer player sustained an acute left hip injury during a tournament game while defending the goal. Magnetic resonance imaging demonstrated a complete avulsion of the iliopsoas tendon from the left trochanter. The patient was treated nonoperatively, and after 10 weeks, he was able to return to full activity. After 1 year of follow-up, the patient was completely asymptomatic, and was still playing professional soccer without flexion strength deficit.

Conclusion: In this professional soccer athlete, nonoperative treatment of complete psoas avulsion resulted in a good functional outcome and successful return to play.

Soccer is a demanding sport where players are subjected to long-distance running, with several speed adjustments, and frequent and repetitive changes in direction which predispose soccer players to a multitude of lower extremity muscle injuries. The most commonly injured muscles are the hamstrings[1]. Interestingly, despite a better understanding of the mechanisms of injury and prevention, the incidence of muscle injury remains high in professional soccer with no signs of decline.[2]

The iliopsoas is the most important hip flexor. It originates from the lower spine and inner portion of the iliac wing and attaches to the lesser trochanter. Although psoas tendinopathy is a relatively infrequent cause of hip pain in athletes, muscle strains and tearing of the psoas are also not common[3]. Complete avulsions of the psoas are considered rare, occurring mainly in elderly women[4-6]. To our knowledge, there are no publications in the English literature addressing this entity, its treatment, and eventual return to play after a complete avulsion of the psoas tendon. In this case report, we describe a complete psoas avulsion in a professional male soccer player who was treated nonoperatively. The patient was informed that data concerning the case would be submitted for publication, and he provided consent.

Case Report

A 36-year-old professional male soccer player presented to our clinic with acute left hip pain after a match. He was a goalkeeper for a club participating in the first division of the national league. He felt a sharp pain, accompanied by a pop, deep in his left groin while jumping to defend a penalty kick. Because this was the last penalty kick in a penalty shoot-out at the end of the match, he did not need to continue to play. Even so, he stated that he would not have been able to continue playing if needed because of the hip pain. The patient was able to bear weight on the affected leg; however, he walked with an antalgic gait. Passive range of motion (ROM) examination revealed no limitation compared with the asymptomatic side (flexion 115°, internal rotation 30°, external rotation 40°), although he did complain of pain with ROM of the affected hip. He was not able to perform a straight leg raise, and he noted this maneuver was extremely painful. His impingement test (flexion-adduction-internal rotation) was positive, he presented pain with deep hip flexion, and his flexion-abduction-external rotation (FABER) test was also positive.

Radiographs were unremarkable, demonstrating no signs of fracture or any bony deformities. The lateral center-edge angle was 36°, Tonnis angle was 2°, there was no crossover sign, and the femoral alpha angle was 53°. Tonnis classification was considered 0 (no signs of arthritis). Magnetic resonance imaging (MRI) of the hip demonstrated a complete avulsion of the psoas tendon from the lesser trochanter with proximal migration of the tendon of approximately 4 cm (Fig. 1). There

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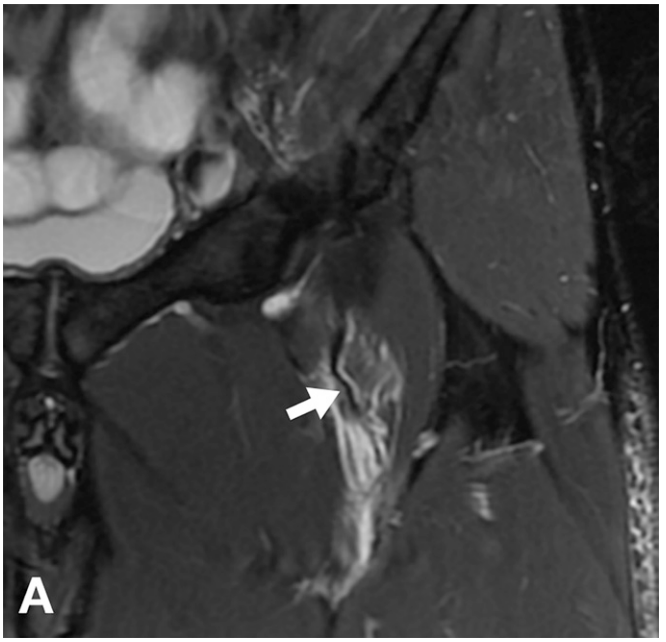

Fig. 1-A

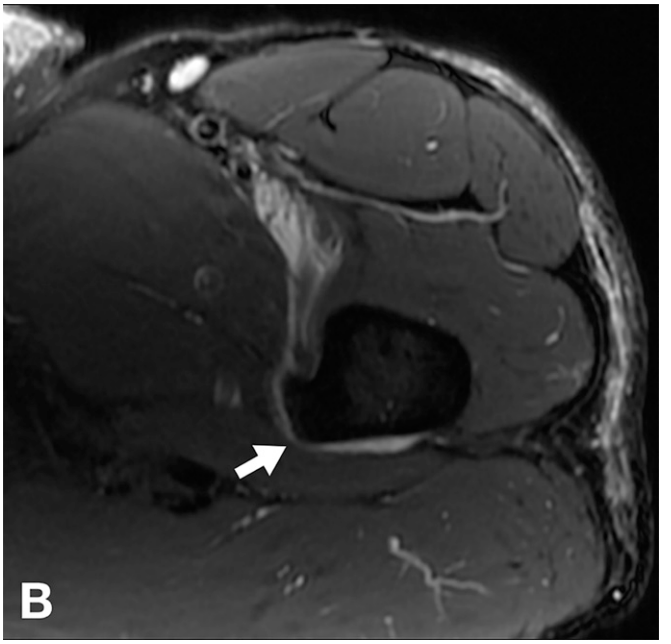

Fig. 1-B

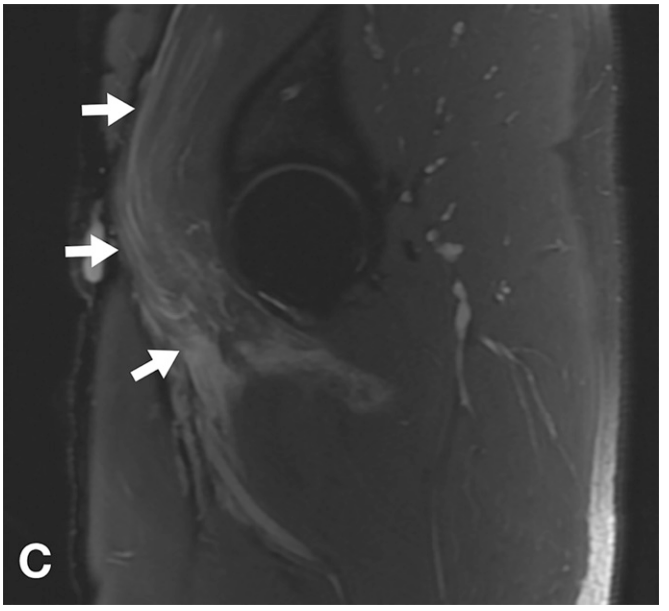

Fig. 1-C

Figs. 1-A through 1-C T2-weighted magnetic resonance imaging with fat suppression of the left hip performed 1 day after injury. **Fig 1-A** Coronal view demonstrating the retracted psoas tendon (arrow) with irregularity and surrounding edema, (**Fig 1-B**) axial view demonstrating a "bald" lesser trochanter (arrow), and (**Fig 1-C)** sagittal view demonstrating extensive edema of the iliopsoas muscle (arrows) throughout its course.

was also fluid around the tendon suggesting hemorrhage and severe edema of the myotendinous junction.

The patient was treated nonoperatively with weight bearing as tolerated with crutches, and physiotherapy was started immediately to reduce his pain and inflammation. Passive ROM was also performed to maintain full range of motion. He ambulated with crutches for 5 days but quickly weaned off the crutches as he became comfortable weight bearing without them by that point. The patient was prescribed 3 weeks of nonsteroidal anti-inflammatory medications for heterotopic ossification (HO) prophylaxis. Ten days after the injury, the athlete started biking on a stationary bike with no resistance and deep water running to maintain his cardiovascular fitness.

By 3 weeks postinjury evaluation, the patient noted nearly no pain. A strengthening program was initiated, starting with isometric exercises, progressing cautiously to isotonic

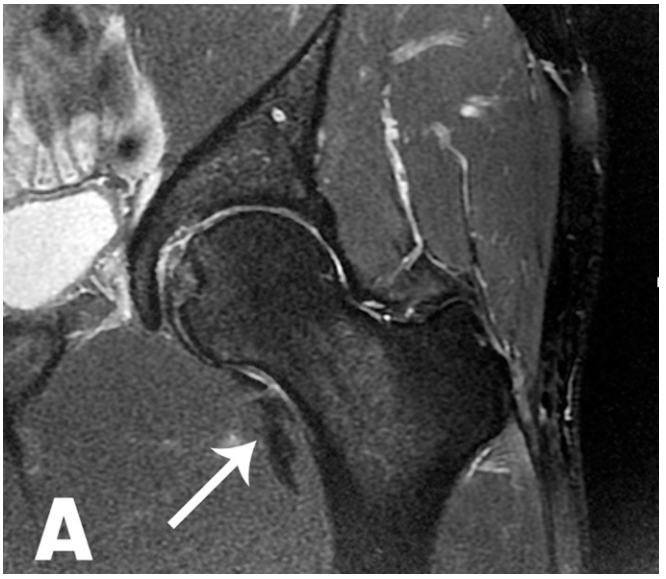

Fig. 2-A

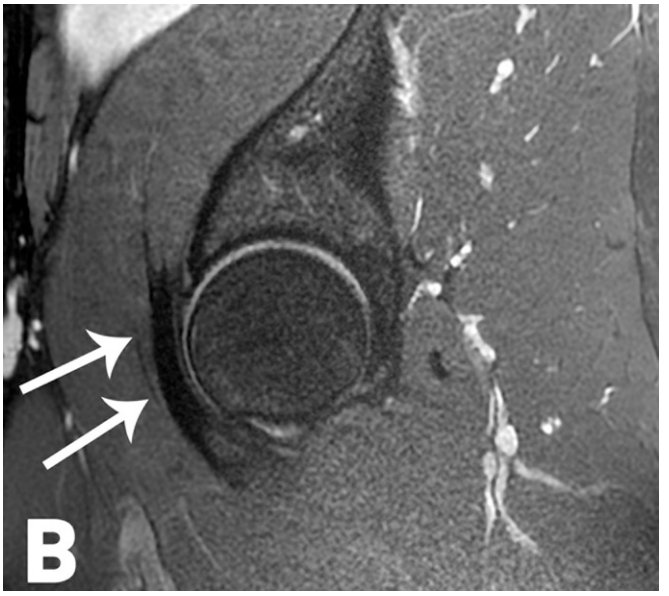

Fig. 2-B

Fig. 2-C

Fig. 2-D

Figs 2-A through 2-D T2-weighted magnetic resonance imaging with fat suppression of the left hip performed 20 months after injury. **Fig 2-A** Coronal view demonstrating the healed psoas tendon (arrow) as it approaches the lesser trochanter, (**Fig 2-B**) sagittal view demonstrating resolution of the edema in the iliopsoas muscle and tendon healing (arrows), and (**Figs. 2-C and 2-D**) axial view demonstrating partial reattachment of the psoas tendon in the lesser trochanter (arrow).

strengthening, and then to more intense exercise. Six weeks after the injury, he was pain-free with good strength, and as a result, he was cleared to progressively resume his soccer athletic activities in ball practices. Ten weeks postinjury, he was back on the active roster but did not play. Although he did not play, he was confident he could. Moreover, he was already playing full games during practice. At the last follow-up, 20 months after the injury, the player reports that he has not had any further issues related to his hip. He refers 0 pain on the Visual Analog Scale, and his current iHOT-33 is 100[7]. He continues to play soccer professionally on the same club, and during the season after his injury, he played 36 professional games, and on physical examination his ROM was symmetric to the contralateral side. His straight leg raise and hip flexion with the knee in 90° of flexion is pain-free, with no detectable strength difference between sides on manual testing. A strength test on the Kineo testing machine (Globus, Codogne, Italy) demonstrated no strength deficit during bipodal squatting. A follow-up MRI,

20 months after the injury, demonstrated healing of the psoas tendon, partial reattachment to the lesser trochanter, no further shortening, and resolution of the edema (Fig. 2).

Discussion

Iliopsoas injuries are an uncommon entity, with avulsions being rare. In a retrospective study of 4,862 MRI examinations of the hip and pelvis, only 32 patients demonstrated iliopsoas tears (0.66%)[3]. In patients younger than 65 years (16 patients), the authors identified only partial tears and strains and no complete tears. All complete tears (8 patients) were women older than 65 years of age. Ten injuries were sports-related. After a thorough literature review, the authors identified 26 cases (25 patients) of complete psoas tendon tears and most of these reported cases were in elderly patients[3-6,8-16]. Cases involving younger patients frequently occurred in conjunction with a history of total hip replacement (THR) or with severe comorbid medical conditions. Most tears were atraumatic. All cases were treated conservatively, with most cases reporting a good clinical outcome. Maheshwari et al.[8] reported a case with nonoptimal outcome. At a follow-up of 4 years after a complete tear in a patient with a previous THR, the patient still needed a cane to ambulate.

Psoas lesions in younger patients are typically muscle strains or partial tears, which can be treated nonoperatively. Only one athletic patient with a complete tendon rupture has been reported in the literature; however, the treatment and clinical outcome were not detailed[16]. In the same article, the authors reported that the most common mechanism of psoas tendon injury is change of direction.

Therefore, the case described herein is a rare form of psoas tendon tear. The lack of previous literature reporting successful treatment of this unusual problem in an athlete posed a dilemma to the treating team as to the optimal treatment of choice for this player: did the athlete need surgery? A surgical reattachment could be performed through an open or arthroscopic approach, but neither procedures have been described in the literature. Although an arthroscopic approach seemed less aggressive, it was questionable if it was feasible, considering the amount of retraction found in the MRI (4 cm). An open approach to the lesser trochanter could be very damaging to the surrounding musculature and neurovasculature and might have been even more detrimental to the patient. One author performed a lesser trochanteric excision in a young, athletic patient for symptomatic ischiofemoral impingement[17]. Excision of the lesser trochanter necessitated release of the entire iliopsoas tendon. By 3 months after surgery, the patient had good strength and ability to ambulate without assisting devices, and by 2 years after surgery, she had excellent strength and was jogging 3 miles a day. The clinical outcome of this patient after a complete release of the iliopsoas tendon indicated to the treating physicians/authors that this soccer player's complete iliopsoas avulsion may be effectively treated without surgery. The medical team, together with the patient, opted for the conservative (nonsurgical) approach. Both the doctors and the athlete ultimately have been pleased with the final outcome.

Alternative nonoperative treatment protocols could be used. A hip brace could be used to keep the hip flexed and may promote tendon healing. However, this may also lead to flexion contracture. Because this patient was a professional player, very motivated, and was rapidly pain-free, an early rehabilitation protocol was adopted; however, a more restrictive protocol to facilitate tendon healing is also an alternative. Heterotopic prophylaxis was prescribed based on previous reports of HO after rectus femoris avulsion.[18,19]

The use of biologics in hip pathology has been recently described and could be used to promote healing[20]. Platelet-rich plasma (PRP) has been demonstrated to promote faster return to play in hamstring muscle injury[21]. PRP has also shown excellent clinical results in the treatment of tendinopathy of the hip, including the hamstrings, adductor longus, and gluteus medius[22-24]. Nonetheless, the role of PRP in patients with tendinous avulsion has not been reported, and the player together with the treating physician decided against it.

Limitations of this report include the lack of a side-to-side objective comparison of hip flexion strength after the injury. Albeit, the athlete was playing professionally and able to join the team in strength training. Furthermore, he had no obvious hip functional deficit on bilateral squatting test.

In conclusion, we report a rare case of a complete avulsion of the psoas tendon in a professional athlete treated nonoperatively. An excellent outcome was achieved, and nonsurgical treatment can be considered for high-performance athletes with similar injuries. ■

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