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Case Presentation

Ultrasound-Guided Scraping for Chronic Patellar Tendinopathy: A Case Presentation

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Abstract

Chronic patellar tendinopathy is a common complaint among athletes who repetitively stress the extensor mechanism of the knee. Multiple treatment options have been described, but evidence is lacking, specifically when eccentric loading has failed. Debate continues regarding the patho-etiology of chronic patellar tendon pain. There has been recent interest regarding the neurogenic influences involved in chronic tendinopathy, and interventions targeting neovessels and accompanying neonerves have shown promise. This is the first description of an ultrasound-guided technique in which the neovessels and accompanying neonerves in patellar tendinopathy were targeted using a needle scraping technique of the posterior surface of the patellar tendon.

Introduction

Chronic patellar tendinopathy (PT), or jumper's knee, is a common complaint among athletes who repetitively stress the extensor mechanism of the knee [1]. Despite its common occurrence, the exact patho-etiology remains undefined. The role of inflammation has come into question based on histologic studies failing to show substantial inflammatory cells in the chronic setting. Structural findings of mucoid degeneration and angiofibroblastic neoplasia have been well described and are now referred to as "tendinosis" [1]. More recent studies have examined the role of neurogenic mediators on chronic tendon pain and dysfunction, and interventions targeting this process have reported favorable outcomes in PT [2-5]. Although multiple treatment options have been proposed for PT, evidence is lacking, specifically when eccentric loading has failed [6]. Herein we describe a novel ultrasound-guided percutaneous technique which allows for quick return to activity.

Case Presentation

We present the case of a 17-year-old football and basketball player with 6-month history of anterior knee pain. Before our assessment, he was clinically diagnosed with PT by his athletic trainer and underwent conservative treatment including eccentric strengthening and training modifications. Due to increasing pain and functional limitation, he was referred to our clinic at the conclusion of his football season. He was 188 cm tall and weighed 129 kg (BMI of 36.5). Pertinent clinic examination findings included pain with palpation over the proximal patellar tendon and pain with resisted knee extension. The remainder of the knee examination was unremarkable. The patient's Victorian Institute of Sport Assessment (VISA) score was 34, Blazina score was 5, and visual analog scale score was 10 (worst pain rating) [7]. Diagnostic ultrasound of the left knee was performed using an iU22 unit (Philips Healthcare, Bothell, WA) with a 12-5 MHZ linear array transducer. The left proximal medial patellar tendon displayed hypoechogenicity, heterogeneity, and focal thickening/swelling (Figure 1A, B) consistent with high grade tendinosis without evidence of tear. Color Doppler evaluation demonstrated a modified Ohberg score of 1+ with the neovascularity arising from the posterior surface (Figure 1C) [8]. Upon discussing various available treatment options (including risks, benefits, available supporting literature, and our clinical experience), he elected to proceed with percutaneous ultrasound-guided scraping (USGS).

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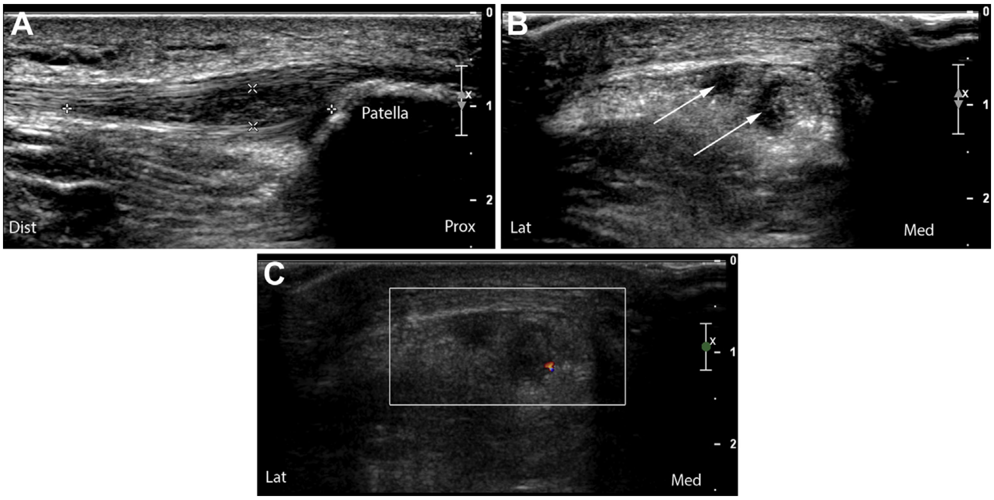

Figure 1. (A) Long-axis image of the left patellar tendon with proximal toward the right side of the screen. The region between the markers demonstrates hypoechogenicity and loss of fibrillar architecture consistent with tendinosis. (B) Short-axis image of the left patellar tendon with medial toward the right side of the screen. There is focal involvement of the medial aspect of the tendon (arrows) with sparing of the lateral aspect. (C) Color Doppler image of the left patellar tendon in short axis. One neovessel is seen in the posterior aspect of the tendon. Dist = distal; Prox = proximal; Med = medial; Lat = lateral.

The procedure was performed in an outpatient clinical procedure suite. The patient was placed in supine position with the knee slightly flexed to approximately 20° and supported by a pillow. The skin was cleansed with a chlorhexidine and alcohol solution. A 25-gauge, 2-inch needle was used to obtain local anesthesia with 5 mL of 1% lidocaine. An 18-gauge, 2-inch needle was then guided from a medial approach initially using a short-axis view of the patellar tendon to ensure proper placement just posterior to the tendon surface (Figure 2). The needle was then used to mechanically separate the Hoffa fat pad from the posterior tendon surface, using a scraping motion, with the bevel directed posteriorly (ie, the needle is advanced horizontally along the tendon width while the needle tip is simultaneously moved in a posterior direction).

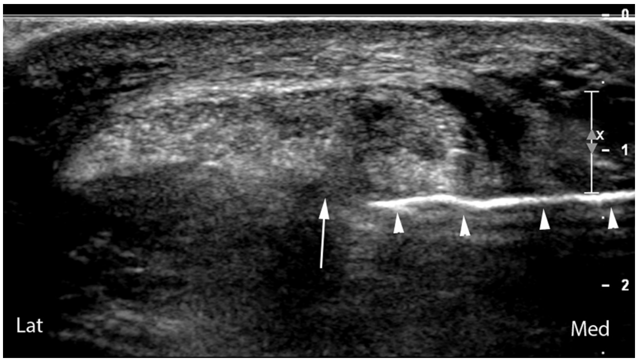

Figure 2. Short-axis image of the left patellar tendon with medial to the right of the screen. An 18-gauge needle (arrowheads) is guided to the interface between the posterior aspect of the tendon and Hoffa fat pad (arrow). The needle is then used to mechanically separate the 2 layers, effectively disrupting the bridging neovessels and associated neonerves.

Orthogonal imaging planes were used to ensure adequate separation along the length of the tendon, with particular attention to the region of tendinosis and neovascularity. Multiple passes were required, and 20 mL of sterile saline solution was used to assist the separation via a hydrodissection technique. The procedure was considered complete when the fat pad was separated from the posterior tendon surface, determined by free flow of saline and the absence of flow on Doppler imaging.

The patient was allowed to weight bear as tolerated, using crutches until able to walk without a limp (3 days). Compression and ice were used for local pain control. Active range of motion and pain-free isometric quadriceps strengthening were prescribed starting on postprocedure day 1. The patient was progressed under the supervision of a physiotherapist in the second week with nonimpact strengthening exercises. At 2 weeks, the patient was pain free with all activities of daily living and therapy exercises. He was then progressed to full tendon loading as tolerated under the supervision of his athletic trainer. He was able to return to full basketball participation at 4 weeks postprocedure and completed the basketball season with no symptoms or limitations. At the 6-month follow-up, his VISA score was 95, Blazina score was 1, and visual analog scale score was 1/10 (worst pain). On his 6-month postprocedure questionnaire, he reported that he was very satisfied with the procedure and that he would recommend the procedure to a friend or family member. Eleven months postprocedure, patient remains asymptomatic while successfully playing National Collegiate Athletic Association (NCAA) division I football.