TREATMENT OF A PROFESSIONAL POLE VAULTER WITH INSERTIONAL ACHILLES TENDINOPAHY USING TENDON FENESTRATION, SYMPTOMS AND OUTCOMES CORRELATE WITH TENDON THICKNESS AND TENDON STIFFNESS: A CASE STUDY

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Introduction: Achilles tendinopathies are common and can occur during the peak of an athlete's career. Currently, the impact of a rehabilitation program on the biomechanical properties of Achilles tendons are poorly understood, with conflicting evidence. Tendon fenestration dry needling is in its infancy, with promise for chronic tendinopathies. The purpose of this case is to present a novel treatment of using tendon fenestration of the Achilles tendon, followed by a traditional tendon loading program, and the correlations of the biomechanical properties of the Achilles tendon for a professional pole vaulter with insertional Achilles tendinopathy.

Case Description: A 28-year-old professional pole vaulter with a 2-year history of left insertional Achilles tendinopathy, limiting her ability to compete, was treated initially with tendon fenestration followed by a traditional tendon loading program. The patient had pain with palpation at the Achilles insertion, pain with passive dorsiflexion and loaded plantarflexion. Her VISA-A at the evaluation was 57%. Ultrasound imaging of the Achilles showed thickening at 8.0 mm vs 6.0 mm of the right; however, no interruptions of the internal fibrillar structure of the tendon. Tendon stiffness was measured with the MyotonPro, a myotonometer, that has been shown to be both a reliable and valid tool for tendon biomechanical measurements. Using the mean of 3 measurements, the left tendon stiffness was 733 N/m while the right was 822 N/m, an 89 N/m difference.

Outcomes: Over the course of 4 months, the VISA-A improved 20 pts (MCID 6.5 pts), ultrasound imaging showed decreased thickness by 24% from 8.0 mm to 6.1 mm, myotonometer measurements showed increased Achilles tendon stiffness from 733 N/m to 852 N/m, a 120 N/m increase. There was a strong positive correlation between tendon stiffness and VISA-A (r = 0.75). There was stronger negative correlation of tendon stiffness and tendon thickness (r = -0.89) The patient was able to return to pain free running and jumping at this point.

Management: Tendon fenestration dry needling was completed on the first two sessions, with 10 parallel passes of dry needles towards the Achilles insertion on the calcaneal tuberosity, starting about 2 cm proximal. Isometrics and a heel lift were used the first two weeks. Following two weeks, a traditional tendon loading program was initiated. The tendon loading program was progressed once a week over the next 4 months, initially following the Silbernagel Protocol and then progressing using the Baxter et al. loading index to continue to incrementally load the Achilles tendon with lower extremity strengthening and plyometrics.

Discussion: This case demonstrates that tendon fenestration dry needling may be a promising addition to the treatment of chronic insertional tendinopathy. Biomechanical properties improved simultaneously as the tendon loading program progressed, while the symptoms and outcomes improved on the VISA-A. This case also demonstrated that tendon thickness can change incrementally with the progression of rehab, symptoms, and outcomes. Consistent, strict adherence to a tendon loading program with highly structured, incremental progression lead to the successful return to very high-level athletics for an international level athlete who was limited with her ability to compete for two years.

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