Tendinopathy: Evidence-Informed Physical Therapy Clinical Reasoning

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Patients presenting with pain at the tendon, which is associated with physical tasks and activities that specifically load that tendon, are at the center of this special issue. In a classical medical model, an understanding of the underlying pathology is deemed desirable in guiding medical management. There is some difficulty in applying this model to symptomatic tendons, mainly because the pathology of symptomatic tendons has not been clearly elucidated (see Scott et al[17] herein). Complicating matters further is the mismatch between reported pain (and disability) and imaging (and pathology), as well as evidence of widespread sensory nervous system sensitization in some tendinopathies.[14] As Scott et al[17] explain, the current terminology for a symptomatic tendon presentation is *tendinopathy*, as this does not denote an underlying pathology, but rather signals that all is not well in the tendon. In contrast to the uncertainty surrounding the underlying pathology and pain mechanisms of tendinopathy, a diagnosis of tendinopathy is reasonably easy to make clinically, on the basis of localized pain over the tendon that is associated with loading of the tendon.

The consensus is that management of tendinopathy should optimally involve addressing loading of the tendon.[3-5,7-9,11,18,19] Management of load in tendinopathy, especially if acutely painful, usually commences with reduction or complete removal of offending activities and the introduction of appropriate and graduated loading exercises. To be effective, this requires patient buy-in, which is critical for the physical therapist to obtain. Patient buy-in involves the clinician educating the patient about the nature of the tendinopathy, its relationship to loading, and the likely recovery trajectory. As the patient learns the fundamental aspects of tendinopathy, it is imperative that the physical therapist implement an individualized exercise program. This exercise program should be adequately supervised, reviewed, and progressed to ensure adherence and resolution of the tendinopathy. The importance of this approach is emphasized by all authors of the articles on tendinopathies covered herein.[3,6,7,9,19]

Contemporary practice in managing tendinopathy necessitates the physical therapist exploring the nexus between symptoms (predominantly pain) and loading. In this regard, several concepts are canvassed in this special issue: (*a*) symptom-guided management,[19] (*b*) symptom-modification management,[3,9] (*c*) compressive versus tensile loads,[7] (*d*) stages of loading throughout the rehabilitation process (isometric and isotonic strengthening, energy storage and release, return to play),[11] and (*e*) what I will refer to as movement competency.[3,11,20] Essentially, these concepts emphasize the need to optimally load the tendon—in a way that does not provoke pain—by using symptom-modification procedures[3,9] or by limiting the joint position to one that does not compress the insertion of insertional tendinopathies.[3,7] In the lower limb (Achilles tendon, patellar tendon), it appears that pain up to 5/10 on a numeric rating scale during and after training is not harmful and may be desirable.[11,19] Most authors indicate that pain and stiffness within the 24 hours following training, notably the next morning, are to be noted, and, if worse, may be indicative of overload and require commensurate modulation of the rehabilitation loads.[11,19]

A fundamental tenet that has held fast in orthopaedic physical therapy for many decades has been that isometric contractions in early acute painful phases of an injury reduce stress on injured joint structures. As the condition resolves, the practice has been to switch to iso-

tonic resisted exercises to build muscle strength (hypertrophy) and endurance. It appears that this approach is also valid for the management of tendinopathy,[11] especially in the acute painful stage, with recent evidence showing that high-load isometrics may relieve pain and, as such, may be good to implement early in the rehabilitation program.[15] In the early acute painful stages of insertional tendinopathies in particular, isometric and isotonic exercises are performed in positions that do not compress the insertion (eg, movement past neutral toward hip adduction is avoided for gluteal tendinopathy),[7] because compression is usually provocative. Managing tendinopathy with isometric contractions in non–pain-provocative positions might also ameliorate sensory nervous system involvement that is present in some tendinopathies.[14] The fad of giving all patients with tendinopathy an eccentric exercise program from the outset has largely abated; however, after adequate strength of the muscle has been achieved, it is necessary to use eccentric exercises to reinstitute the energy-storage/return capacity of the musculotendinous complex before moving to complex sport-specific tasks.[2,11]

Movement competency refers to the optimal usage of body segments and associated muscles to perform movement efficiently, and is mainly about the form and shape (posture and alignment) with which a physical activity is performed. In this special issue, we have included a case report of an athlete with patellar tendinopathy who was successfully treated by correction of landing technique from a jump, as well as by addressing the weakness in the gluteal muscles, which was considered to be associated with the initial poor landing mechanics.[20] The authors of the case propose that there was weakness of the hip extensors and poor control at the hip proximally during landing, which contributed to the patellar tendinopathy through abnormal loading. This case serves as a good example of the need for the physical therapist to evaluate and address the movement patterns of the physical tasks associated with the tendinopathy. The concept of movement competency is also emphasized in the papers on the management of gluteal, patellar, and lateral elbow tendinopathy herein.[3,7,11] Careful evaluation of movement and implementation of an individualized patient-specific exercise program require regular physical therapist oversight throughout the rehabilitation period, as well as the monitoring of progress with valid outcome measures.[10]

Recently, a range of techniques have been introduced that could be termed *symptom-modification* techniques or procedures. Such procedures seek to reduce symptoms substantially, if not totally, in concurrence with their application. For example, these procedures may involve (*a*) instructing the patient to move differently (using visual, verbal, and/or manual cues, as in "lean forward with the trunk during landing"[20]); (*b*) manual handling, as with Mulligan's mobilization-with-movement techniques[3]; or (*c*) use of tape or belts (external physical devices), such as taping the scapula to improve arm elevation, as in the article by Lewis et al[9] published in this special issue. If, on application during the problematic movement/task, the movement is pain free, then it can be used to enable exercise that specifically loads the tendon. It is my contention that symptom-modification procedures are most helpful when the patient can self-apply them. The symptom-modification approach is a valuable tool to enhance patient buy-in and improve adherence to the exercise program. It may also be a strategy to address nervous system sensitization.[14]

Given that tendinopathy is reasonably easy to recognize clinically, diagnostic imaging (eg, ultrasound, magnetic resonance imaging) is advisably best undertaken when (*a*) the case is complicated/complex and long-standing, (*b*) an appropriate rehabilitation program has failed, or (*c*) a thorough clinical examination has identified differential diagnoses in need of exclusion. In clinical cases that fail an appropriate rehabilitation program, there is a view that imaging, such as ultrasound, can be used in the physician's offices to guide invasive medical treatments.[1] It is apparent from research of imaging in tendinopathies that (*a*) imaging-identified tendon pathology exists in asymptomatic persons,[6] (*b*) a patient's recovery can occur without reversal of imaging-identified tendon pathology,[16] and (*c*) there is no identifiable pathology of significance in some cases of tendinopathy.[1,6] This underpins a case for the interpretation of imaging to be made in context of the patient's history, symptoms, and clinical signs. The role of imaging has been increasingly interrogated, compelling the inclusion of a specific paper on this topic in this special issue.[1]

As outlined by authors in this special issue, tendinopathy is a prevalent and substantial problem, as it interferes with a person's capacity to lead a physically active and healthy life, which has a considerable flow-on effect on society in general. This issue deals with the contemporary physical therapy management of tendinopathy by providing a mix of evidence review and clinical expert opinion on commonly presenting tendinopathies of the lower limb (ie, Achilles tendon,[19] patellar tendon,[11] gluteus medius and minimus tendons[7]) and upper limb (ie, shoulder[9] and lateral elbow tendons[3]). These papers are supported by updates on clinically relevant matters pertaining to exercise in tendinopathy,[4] pathology,[17] diagnostic imaging,[6] sensory sensitization,[14] and outcome-measure considerations.[10] In addition to these clinical commentaries and research reports, with the aim of enriching and enlivening their contributions, we have sought editorial commentaries on the implementation of evidence in clinical practice,[13] the disconnect between structural changes and symptoms,[16] the physician's perspective on imaging,[1] and a salient reminder to not treat all tendons the same way.[12] Contemporary clinical physical therapy practice requires that the clinician be apprised of the current evidence, while negotiating with the patient to provide

the most appropriate rehabilitation for the specific tendinopathy. I commend this special issue of *JOSPT* for the treatment of tendinopathy and trust that it will prove useful in this regard.

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