

Tendinopathy in type 2 diabetes: a condition between specialties?

INTRODUCTION

People with diabetes have a threefold increased risk of all musculoskeletal conditions, but are particularly vulnerable to tendon conditions, which are more treatment-resistant than in patients without diabetes.^{1,2} This is important as such problems can limit the opportunity to exercise as part of diabetes management.¹ Discriminating between tendonitis and tendinopathy, conflicting evidence on treatment, and slow recovery can make these conditions challenging for GPs to manage. This article highlights key features of tendinopathy within diabetes and current evidence for treatment. Increased awareness may facilitate early diagnosis and improved outcome.

Up to 50% of people who drop out of exercise interventions for type 2 diabetes do so due to musculoskeletal symptoms.¹ A significant proportion of these will be due to tendinopathy. Common manifestations are Achilles tendinopathy, rotator cuff syndrome, lateral epicondylitis, and trigger finger. Patients with type 1 or type 2 diabetes have an increased risk of developing these conditions, although the mechanism for this is unclear.² Symptoms can often last several months and cause considerable loss of function. Within the authors' own practice, 18% of patients with diabetes have been affected in the past 5 years, with a mean symptom duration of 3 months. Approximately 5% of a GP diabetes caseload will develop tendinopathy annually.¹ This compares with a background prevalence of approximately 2%.³

DEFINITIONS

The nomenclature of tendon conditions is confusing. Tendonitis relates to acute conditions and involves inflammation of the tendon, from injury or overuse. Tendinopathy, however, is a degenerative process, with little or no inflammation and occurs over weeks or months.

PATHOLOGY

Tendinopathy is the end result of a chronic

imbalance between opposing processes of degeneration and repair in the tendon, usually from overuse injuries. In diabetic tendinopathy, however, the degeneration arises from advanced glycation end-products accumulating in load-bearing collagen. Vascular integrity and healing are often impaired, and collagen and matrix production abnormal.² Obesity, hypertension, ageing, alcohol, and smoking often coexist, and are independent and exacerbating factors.¹ The pathological processes accumulate over years preceding clinical symptoms. The risk of tendinopathy increases in patients on insulin and with diabetes duration (mean 5.3 years).¹ Indeed, screening of older patients with type 2 diabetes by ultrasound found 36.8% had asymptomatic Achilles tendinopathy.⁴ Other soft-tissue conditions such as bursitis, carpal tunnel syndrome, Dupuytren's contracture, frozen shoulder, and plantar fasciitis are not primarily disorders of tendons but share pathological similarities and are also more common in diabetes.⁵

CLINICAL FEATURES

The onset of tendinopathy is usually gradual with no history of injury, although it can be precipitated by a seemingly trivial activity. Thereafter, tendon movement causes disproportionate pain and stiffness that the patient assumes will self-resolve. Symptoms may fluctuate and patients often present weeks or months after failing to improve. Symptoms lasting longer than 2 months are suggestive of tendinopathy. On examination, there is tenderness on palpation of the tendon and pain on active or passive movements, but absence of erythema or warmth to touch. There is often an associated reduction in muscle strength. Tendon thickening can cause additional impingement symptoms and positive impingement signs in the case of rotator cuff tendinopathy and triggering in finger flexor tendons. Because metabolic degeneration underlies both diabetic and non-diabetic tendinopathy, the presence of

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risk factors, in addition to diabetes, should raise suspicion of the diagnosis.

The differential diagnosis of tendonitis is clinically distinguishable by displaying inflammatory signs of erythema and warmth to touch, often with crepitus on movement. Tendon rupture is a differential and requires ultrasound to distinguish, although partial tears are common and do not require referral for treatment. Cellulitis also displays inflammatory features but lies within the skin and tissues overlying the tendon.

TREATMENT

The variability of research into tendinopathy treatments makes definitive treatment recommendations difficult. The *BMJ Best Practice* clinical support tool on tendinopathy, by Fu *et al*, summarises the evidence for diagnosis and treatment.⁶ Diabetes-associated tendinopathy is little researched and is managed in a similar way to overuse tendinopathy, but may respond less well, due to greater underlying degeneration.² The National Institute for Health and Care Excellence recommends specific Systematic Reviews and Clinical Knowledge Summaries for assessment and treatment of specific tendons. Early physiotherapy referral for specific exercise programmes is essential and forms the mainstay of treatment. The rationale is for controlled loading to promote tendon regeneration and muscle stretching to improve muscle–tendon reflexes, which reduces tension on the tendon.² Increasing overall fitness also helps to improve tendon function and modulate pain. Compliance with physiotherapy is key and warning patients that the condition is prolonged and that recovery can be painful and slow can help to manage patient expectations.

Where there is associated inflammation (tendonitis) also present, a 2-week course of non-steroidal anti-inflammatory drugs (NSAIDs) is indicated, being mindful of the risks of renal impairment. For patients unsuitable for oral NSAIDs, for example patients with coexistent hypertension and chronic kidney disease, topical NSAID gels can be effective.

Despite tendinopathy not being inflammatory, corticosteroid injections can provide excellent short-term pain relief and enable patients to start physiotherapy. However, repeated injections risk local infection and damage tendon integrity, risking further degeneration and rupture.⁷ Manual therapy, taping, and ultrasonic treatments are poorly effective individually but can be effective in combination.¹

Patients with type 2 diabetes often have other comorbidities and frailty. Load progression exercises should therefore be individualised and under physiotherapist supervision. Successful exercise programmes also prevent future episodes as tendinopathy is often recurrent.¹

Medical management should include review of diabetes control because outcome is improved in patients with lower levels and variability of glucose and lower HbA1c levels.¹

Conversely, the tendinopathy treatment may affect patients' diabetes control: rehabilitation exercises can affect glucose levels; and local corticosteroid injections have mild systemic hyperglycaemic and immunodepressive effects, although these are transient and alteration of diabetic medications is rarely required.⁸

This emphasises the complexity of diabetic tendinopathy management and the need for a holistic and multidisciplinary approach involving physical therapists and diabetes practitioners.

CONCLUSION

Diabetic tendinopathy is not an overuse injury of a normal tendon, but the end result of longstanding metabolic degeneration. Pain, tenderness, and tendon swelling without inflammation, unresolved after 6 weeks, should alert suspicion. Initial management includes optimising diabetes control, stopping exacerbating activities, NSAIDs, and early referral to physiotherapy. Corticosteroid injections provide relief and facilitate rehabilitation exercises, but should be used judiciously. Tendinopathy highlights those conditions more prevalent in diabetes and not intuitively linked to hyperglycaemia. With increased awareness tendinopathy can be referred more rapidly for treatment and unnecessary radiological investigations reduced.

Provenance

Freely submitted; externally peer reviewed.

Competing interests

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