

TREATMENT OF ACHILLES TENDINOSIS WITH THE TOPAZ MICRODEBRIDER

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INTRODUCTION

Chronic pain to the posterior distal aspect of the Achilles tendon is often referred to as tendinopathy. This condition can be self-limited and unfortunately some do not seek treatment until permanent damage is seen from the repetitive microtrauma. This condition can be debilitating and even career-threatening to some athletes. Tendinopathy typically affects active individuals between the ages of 30 and 60. In the athletic population this condition is often associated with overuse of the Achilles tendon.¹

The terms “tendonitis” or “tendinosis” are commonly used to describe pain to the mid-portion of the Achilles despite the absence of inflammation both clinically and histologically. The term chronic tendinopathy is often used for patients with a long history of this condition. Puddu et al suggested using the term tendinosis to describe the degenerative changes to this area. These changes vary histologically but often include: hypoxic degeneration, mucoid or myxoid degeneration, hyaline degeneration, fatty degeneration, fibrinoid degeneration, fibrocartilage growth, osseous growth, calcification, nodular thickening, irregular fiber structure, grayish discoloration of the ground substance, and tendon edema.² The findings along with those by Galliani et al demonstrate that this is a noninflammatory, degenerative condition that may be associated with overuse.³ The research by many authors²⁻⁵ show that tendinosis is characterized by the absence of inflammatory cells, the presence of abundant, disorganized collagen and fibroblastic hypertrophy, and disorganized vascular hyperplasia with avascular tendon fascicles. The vascular structures are believed to be essentially nonfunctional. With the nutritional flow compromised it is no surprise that biologic healing is difficult and compromised. This also explains the often poor results found with conservative treatments.

Imaging for this condition is important. It may show Haglund's deformity or a posterior calcaneal spur

that may cause irritation and inflammation to the Achilles tendon. Magnetic resonance imaging (MRI) may or may not show longitudinal tear of the tendon, but generally will reveal fusiform thickening with fibrosis and the absence of inflammation. Conservative treatments for this condition include nonsteroidal antiinflammatory drugs (NSAIDs), cryotherapy, offloading, physical therapy, and orthotic management. NSAIDs seem to offer minimal relief of pain with chronic tendonitis when compared with acute tendonitis. Injection of corticosteroids in the treatment of this condition is controversial. Judicious use of corticosteroids injections is generally accepted. The medication should not be injected intratendinously, used repetitively, or used in chronic tendon disorders. Short-acting steroids are preferred.

When conservative treatments fail to alleviate the pain, surgical treatments may be used. Typically the surgical treatments include debridement of the degenerated area, repair of the microtears, or tendon augmentation procedures. The authors suggest utilizing another less-traumatic and possibly faster recovering type of procedure. This technique involves the use of a radio frequency based microtenotomy procedure using a TOPAZ microdebrider device (Arthrocare, Sunnyvale CA). This device is approved by the US Food and Drug Administration for use in debridement of soft tissues including tendons. It functions by a process called coblation in which RF energy is used to excite the electrolytes in a conductive saline solution to create high energy plasma. This plasma has sufficient energy to dissolve soft tissue bonds at low temperature without burning the soft tissues itself. This causes an inflammatory reaction to occur, allowing revascularization of the area. Dietz et al found that regeneration of the vascular supply increases substantially between week 3 and 9 after the microtenotomy.⁶ Past study of the healing response following RF microtenotomy showed an increased localized inflammatory response when compared with conventional electro-surgery debridement and was associated with muscle repair rather than degeneration.⁷

CASE PRESENTATION

Achilles tendinosis can present at the insertion associated with Haglund's deformity and/or retrocalcaneal spurring. When these other pathologies exist, surgical treatment becomes more involved because these need to be addressed. For the purposes of this article, a case involving more proximal tendinosis will be presented. In the authors' opinion, this is the best clinical presentation for using the TOPAZ Microdebrider alone when conservative treatment fails. The patient was a 42-year-old male who presented with bilateral posterior heel pain. In his right extremity, his pain was more proximal and he related his Achilles felt thicker and the pain was worsening. The pain had been present for approximately 1 year. Examination revealed a mildly cavus foot structure with palpable thickness noted on the Achilles 2-3 centimeters proximal to the insertion. This area was the focus of pain on palpation. There was no appreciable weakness noted on manual muscle testing of the Achilles. Radiographs of the extremity were unremarkable except for some mild posterior spurring. The patient was prescribed an oral steroid and placed into a fracture walker for initial treatment. Due to the chronicity of his complaint, an MRI was ordered to further assess the tendon. At followup, the patient related that some relief was obtained with steroid use, but it was short lived.

The MRI demonstrated marked fusiform thickening of the entire Achilles tendon, consistent with chronic Achilles tendinosis. There was mucoid degeneration along the posterior medial aspect as well (Figures 1, 2).



Figure 1. A sagittal section of the magnetic resonance image. Note the fusiform thickening of the tendon and the mucoid degeneration posteriorly.

Procedure

A small incision is created over the Achilles area at the area of the pathology. Generally a fusiform thickening is seen. The paratenon is carefully incised and preserved since it contains most of the blood supply for healing. The device is connected to saline solution and the flow is adjusted at 2-3 drips per second. The saline is flushed through the line to remove all air bubbles. The 0.8 mm tip of the TOPAZ device is placed perpendicular to the tendon and activated for 0.5 seconds with light pressure at 5 mm distance intervals. Perforations should vary from 3 to 5 mm in depth creating a grid-like pattern. The entire symptomatic area should be treated (Figure 3).

If the affected tissue has an attachment to the bone it is important to extend the treatment to where the tendon attaches to the bone. The timer on the device provides the predetermined 0.5 second interval. Once the area is treated, it is irrigated with saline and closed with appropriate wound closure.

Postoperative Care

For the first 2 days following the procedure rest and ice is important. After that time, the patient may ambulate in a cam walker and begin active range of motion. The patient generally remains in a cam walker for 3-4 weeks after surgery. It is recommended that the patient avoid heavy lifting and sports for approximately 2 months. A course of physical therapy can be started after the first week to aid in strengthening and range of motion. This has proved to be beneficial in the postoperative treatment.

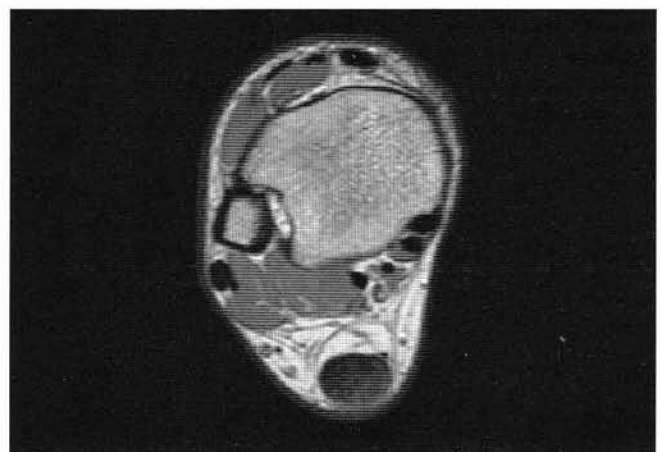


Figure 2. An axial section of the magnetic resonance image. The fusiform thickening of the tendon and the mucoid degeneration posteriorly are apparent.

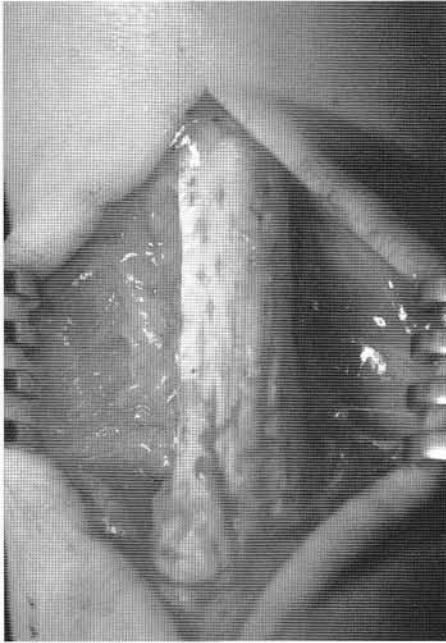


Figure 3. Intra-operative photograph of an Achilles tendon after debridement with the TOPAZ Microdebrider. Note the grid-like pattern created.

Because the goal of the procedure is to bring the tissue back from a chronic state to an inflammatory state, the use of NSAIDs in the first few postoperative weeks is not recommended. Part of this healing process is thickening of the tendon, and even though patients do feel much better at 2 months postoperatively, their tendon can remain thickened for several months. In the authors' experience, this has varied from 3-8 months and patients should be made aware of this.

CONCLUSION

Tendon pathology is often overlooked as a component posterior heel pain. An MRI is beneficial in identifying of patients with tendinopathy and the TOPAZ Microdebrider affords a less invasive option in dealing with this pathology.

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