

# Midsubstance Tendinopathy, Percutaneous Techniques (Platelet-Rich Plasma, Extracorporeal Shock Wave Therapy, Prolotherapy, Radiofrequency Ablation)

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## KEYWORDS

• Achilles • Percutaneous • Alternative treatment • Injections • Ultrasound

## KEY POINTS

- Noninsertional Achilles tendinopathy has been addressed with numerous treatment algorithms ranging from physiotherapy to surgery.
- Percutaneous treatments are commonly advocated as an intermediate modality between surgery and conservative management.
- Percutaneous techniques have wide variability in administration and efficacy.

## INTRODUCTION

Achilles noninsertional tendinopathy can be a challenging pathophysiology to treat. The typical initial treatment phase tends to focus on a combination of rest, activity modifications, therapy protocols, and possible protective devices. At the opposite end of the treatment spectrum would be numerous surgical options. Occasionally, the authors have patients with symptoms and pathologic conditions that may be amenable to an intermediary treatment option, that is, percutaneous techniques. Because the proposed mechanism for degeneration of the noninsertional region of the Achilles has been purported by some researchers to be decreased local microvascular circulation,<sup>1</sup> many of the proposed treatments on the percutaneous arm focus on opportunities to promote the body's ability to repair damaged tissue. Whether the

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Clin Podiatr Med Surg ■ (2016) ■-■  
<http://dx.doi.org/10.1016/j.cpm.2016.10.005>

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theories on ischemic change are the primary pathophysiologic cause of the condition or whether it is mechanically based degeneration has been debated. Similar debates exist regarding the mechanisms by which these different modalities provide relief. Ultimately the goal of most percutaneous procedures is to stimulate a healing response from the body in the damaged tendon tissue.

Percutaneous treatment protocols offer a very attractive option and have garnered significant interest in the orthopedic community. Because they are by design minimally invasive, they are attractive to many providers with the goal of minimizing risk related to open procedures. The evidence regarding the efficacy of these procedures is varied with a lot of anecdotal and industry recommendations discussed. As with any new treatment modality, we must continue to critically analyze the research to determine if the efficacy and cost-effectiveness warrant its consideration for treatment in our patients. The focus of this article is to present the current options available for noninvasive and percutaneous treatment options for noninsertional Achilles tendinopathy. An attempt is made to offer recommendations for both the treatment techniques as well as postprocedure protocols to be considered. Additionally, because there are numerous treatment options in this category, the different techniques are summarized in chart format with a short list of pros and cons as well as the levels of evidence in the literature to support the different modalities ([Table 1](#)).

## INDICATIONS

Generally, indications for percutaneous treatment of midsubstance tendinopathy represent an area between failed conservative treatment and surgical treatment ([Box 1](#)). Conservative treatment usually involves eccentric stretching, rest and activity modification, shoe modification and inserts, and nonsteroidal medication. Extracorporeal shock wave therapy (ECSWT), prolotherapy, platelet-rich plasma (PRP), and radiofrequency ablation (RF) can be used as an adjunct to these treatment modalities. ECSWT,<sup>2-5</sup> prolotherapy,<sup>6-10</sup> and RF<sup>11,12</sup> can be used for pain management. ECSWT has also been reported to improve functional outcomes.<sup>2-5</sup>

Furthermore, if patients are not surgical candidates, these treatments offer another option. ECSWT, prolotherapy, and RF theoretically improve vascularity leading to a more robust healing response. This increased vascularity could counter the known pathologic conditions of midsubstance tendinopathy preventing further surgical intervention. If patients progress, then the increased blood flow at that site could facilitate incision and soft tissue healing. This healing could potentially improve outcomes for patients with known factors that predispose to tendinopathy as well as poor wound healing, including diabetes mellitus, obesity, and steroid use.<sup>13</sup>

General contraindications are related to the need for surgical intervention. A large partial tear or a full tear typically necessitates surgical intervention. Failure of conservative therapy has been correlated with severity of tendon degeneration, age, and duration of symptoms.<sup>14</sup> Although no definitive timetable has been established, studies have noted a duration greater than 6 months as well as greater than 8 to 12 weeks as more likely to lead to surgical intervention.<sup>15,16</sup>

As ECSWT has been a treatment option for years, there is extensive research advocating its use. During this time, specific contraindications have been recommended, including pregnancy, coagulopathies, osseous tumors, osseous infections, and skeletal immaturity.<sup>17</sup> RF is a relatively newer treatment modality; but, in a 2012 study by Shibuya and colleagues,<sup>18</sup> 3 of 47 patients experienced a rupture following RF. All 3 had a high body mass index (BMI). However, the investigators noted mild trauma

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