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J S M T JOURNAL OF SPORTS MEDICINE AND THERAPY
ISSN 2573-1726

Mini Review

Achilles Tendinopathy: Current Concepts in Diagnosis and Evidence-Based Treatment

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Abstract

Background: Achilles tendinopathy is a common load-related disorder affecting both physically active and sedentary individuals. Contemporary concepts have shifted from an inflammation-centered model toward a multifactorial disorder characterized by altered tendon structure, impaired load tolerance, pain, and functional deficits.

Objective: This mini-review critically summarizes current concepts regarding diagnosis and conservative management of midportion and insertional Achilles tendinopathy and translates contemporary evidence into practical treatment decisions with particular emphasis on progressive tendon loading, foot orthoses, extracorporeal shockwave therapy (ESWT), platelet-rich plasma (PRP), corticosteroids and hyaluronic acid.

Methods: Current clinical practice guidelines, systematic reviews, meta-analyses, and randomized controlled trials addressing diagnosis and treatment of Achilles tendinopathy were considered. Publications between 2022 and 2026 were prioritized, with selected older pivotal studies retained. No exhaustive systematic search, independent risk-of-bias assessment, or new meta-analysis was undertaken.

Results: Diagnosis remains primarily clinical, while ultrasonography and magnetic resonance imaging should be reserved for diagnostic uncertainty, atypical presentations, suspected partial rupture, or refractory symptoms. Management of Achilles tendinopathy should reflect symptom location and individual load tolerance. Education and progressive resistance exercise form the foundation of treatment; insertional disease additionally requires attention to compression at the tendon insertion. Evidence published between 2022 and 2026 informs five treatment decisions: individualizing loading, modifying insertional rehabilitation, assessing the incremental benefit of adjunctive procedures, evaluating corticosteroids according to injection location and rehabilitation protocol, and interpreting hyaluronic acid findings cautiously because of limited study quality. Evidence is insufficient to support routine ESWT, PRP, or corrective foot orthoses. Positive findings from individual injection trials do not justify unrestricted application.

Conclusion: Conservative management should prioritize education and individualized progressive loading, with compression-reducing modifications for insertional tendinopathy. Adjunctive interventions should not replace active rehabilitation. Treatments require selective, evidence-informed use: corticosteroid findings depend on injection location and rehabilitation protocol, while hyaluronic acid requires stronger comparative evidence. Persistent symptoms should prompt diagnostic and rehabilitation reassessment before treatment escalation.

More Information

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Submitted: September 26, 2026
Accepted: September 29, 2026
Published: September 30, 2026

Citation: Gassen A. Achilles Tendinopathy: Current Concepts in Diagnosis and Evidence-Based Treatment. J Sports Med Ther. 2026; 11(3): 20-24. Available from: https://dx.doi.org/10.29328/journal.jsmt.1001100

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Keywords: Achilles tendinopathy; Insertional tendinopathy; Progressive tendon loading; Foot orthoses; Extracorporeal shockwave therapy; Platelet-rich plasma; RPP; Corticosteroid injections; Hyaluronic acid

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Introduction

Achilles tendinopathy (AT), traditionally also termed *achillodynia*, is a load-related clinical disorder characterized by localized pain, impaired function, and reduced tolerance to mechanical loading. It occurs frequently in running and jumping athletes but is not restricted to athletic populations [1,2]. Contemporary terminology favors *tendinopathy* rather than *tendinitis*, reflecting the recognition that persistent symptoms cannot be explained by a classical inflammatory process alone.

Two principal clinical phenotypes should be distinguished: midportion Achilles tendinopathy, typically affecting the tendon 2–7 cm proximal to its calcaneal insertion, and insertional Achilles tendinopathy, involving the distal tendon–bone interface [2]. This distinction is clinically important because local biomechanics, compressive forces, associated pathology, and response to treatment may differ.

The etiology is multifactorial. Rather than a single causative factor, AT is best understood as a mismatch between tendon capacity and cumulative mechanical demand. Proposed contributing factors include changes in training load, impaired plantar-flexor capacity, previous lower-limb injury, systemic factors, and certain medications, although the quality of evidence for many commonly cited risk factors remains limited [3].

Diagnosis and clinical assessment

The diagnosis of AT is primarily clinical. Characteristic features include localized load-related pain, morning stiffness, tenderness, and reduced functional capacity. Midportion disease may present with localized or fusiform tendon thickening, whereas insertional disease produces pain directly at the posterior calcaneus [1,2].

Clinical examination should assess ankle mobility, plantar-flexor strength and endurance, pain during tendon-loading tasks, and functional capacity. Repeated single-leg heel raises provide a simple assessment of calf-muscle endurance. Patient-reported outcome measures, particularly the Victorian Institute of Sport Assessment–Achilles (VISA-A) questionnaire, are useful for documenting baseline impairment and treatment response [1,2].

Routine imaging is unnecessary in a typical clinical presentation. Ultrasonography can identify tendon thickening, altered fibrillar architecture, focal defects, and Doppler vascularity. Magnetic resonance imaging may be useful when the diagnosis is uncertain, symptoms are atypical, a partial rupture or alternative pathology is suspected, or surgical treatment is being considered [2].

Relevant differential diagnoses include partial or complete Achilles tendon rupture, paratendinopathy, retrocalcaneal bursitis, posterior ankle impingement, osseous abnormalities, and neurological or referred pain. In appropriate clinical settings, inflammatory rheumatic disease should also be considered.

1. Progressive loading: Individualize the prescription

Education, activity modification, and progressive calf strengthening remain first-line care. A review of 12 randomized trials involving 543 participants found no superiority of a particular loading protocol [4]. A direct comparison of eccentric exercise and heavy slow resistance likewise demonstrated improvement in both groups without a clinical advantage for either approach [5].

A 2026 trial involving 68 patients found no demonstrated superiority of unsupervised eccentric training over sham exercise at 12 weeks: the adjusted VISA-A difference was 4 points (95% CI, −7 to 15) [7]. This imprecise result neither establishes equivalence nor invalidates other progressive loading programmes.

Treatment decision: Individualize resistance, range of motion, progression, and recovery, and review adherence and exercise performance. Associations between higher resistance, lower exercise frequency, and larger effects inform prescription but do not establish an optimal Achilles-specific regimen [6].

2. Insertional rehabilitation: Reduce compression

Loaded dorsiflexion may increase compression at the Achilles insertion. In a randomized trial involving 42 sport-active patients, a programme limiting dorsiflexion, omitting calf stretching, and incorporating heel lifts outperformed higher-compression rehabilitation. Between-group VISA-A differences were 12.9 points at 12 weeks (95% CI, 6.2–19.6) and 10.4 points at 24 weeks (95% CI, 3.7–17.1) [8].

Although point estimates exceeded the study-specific 10-point clinical-importance threshold, the lower confidence limits did not. The small sample and bundled intervention limit generalizability and attribution to individual components.

Treatment decision: Start with floor-level heel raises and limited loaded dorsiflexion, then progress according to tolerance.

Heel lifts

A sham-controlled trial involving 108 patients with midportion tendinopathy found a small pain advantage at 12 weeks: −0.9 points on a 0–10 scale, below the prespecified 1.5-point clinical-importance threshold [9]. For insertional disease, the LIFTIT trial primarily assessed feasibility and does not establish efficacy [10].

Heel lifts may support symptom management but should not replace active rehabilitation. Their independent contribution to the compression-reducing programme remains uncertain.

Foot orthoses

Foot alignment should be assessed without assuming that deformity or pronation causes Achilles tendinopathy. Observational alignment differences establish neither causation nor benefit from correction [11]. In a trial involving 140 patients with midportion disease, customized orthoses added to eccentric exercise provided no demonstrated advantage over sham inserts. The three-month VISA-A difference was 2.6 points (95% CI, −2.9 to 8.0), with 70.7% follow-up [12].

A monitored trial for a relevant coexisting foot problem may be reasonable as clinical judgment, rather than established Achilles-specific treatment. Define the goal and review comfort, symptoms, and function. Foot orthoses and heel lifts address different mechanical objectives.

3. Adjunctive procedures: Establish incremental Benefit

Extracorporeal shockwave therapy

A 2022 review supported ESWT added to loading for midportion tendinopathy [13]. Subsequent evidence warrants greater caution. In insertional disease, radial ESWT provided no demonstrated advantage over sham treatment with identical education and exercise [14]. A 2026 synthesis of nine trials involving 557 participants found no established clinically meaningful overall benefit; certainty ranged from very low to moderate [15].

Treatment decision: Do not treat ESWT as an automatic next step. If considered, discuss its uncertain incremental benefit, cost, and protocol variability.

Platelet-rich plasma

In a trial involving 240 patients with midportion tendinopathy, a single intratendinous PRP injection provided no demonstrated benefit over sham treatment at six months. The VISA-A difference was −2.7 points (95% CI, −8.8 to 3.3) [16]. Meta-analyses published in 2025 and 2026 likewise found no demonstrated clinical benefit [17,18].

Treatment decision: Routine PRP is not supported. Biological plausibility and preparation variability do not establish efficacy, and overlapping meta-analyses should not be counted as independent confirmations.

4. Corticosteroids: Specify injection location and rehabilitation

A placebo-controlled trial involving 100 patients supports ultrasound-guided peritendinous corticosteroid injection combined with exercise for selected chronic midportion cases. The between-group advantage in VISA-A improvement was 17.7 points at six months (95% CI, 8.4–27.0) [19]. The protocol included progressive resistance exercise and three months without running or jumping. No severe adverse events were observed over two years, but the sample could not exclude rare rupture.

These findings do not establish efficacy or safety for intratendinous injection, injection monotherapy, or unrestricted sporting activity. High-volume injection evidence suggests possible early advantages of corticosteroid-containing procedures without a clear sustained incremental benefit [20]. Expert guidance remains cautious [3,21].

Retrocalcaneal bursal injections target a separate structure. In a retrospective series of 218 injections, four subsequent Achilles ruptures were documented, each following an acute injury [22]. This association establishes neither causation nor a transferable risk estimate for peritendinous treatment.

Treatment decision: Consider corticosteroids selectively under specialist care, with ultrasound guidance, avoidance of intratendinous deposition, a defined loading plan, and discussion of uncertain uncommon harms [3,19,21,23].

5. Hyaluronic acid: Interpret preliminary findings cautiously

A 2017 randomized trial involving 62 patients found greater pain improvement with peritendinous hyaluronic acid (HA) than with ESWT for midportion tendinopathy [24]. Without placebo or optimized-rehabilitation controls, its specific incremental benefit remains uncertain. A reported change in the primary endpoint adds methodological concern.

Recent insertional evidence is uncontrolled. A series involving 25 patients and 29 feet reported a reduction in median pain from 8 to 3/10 at six months [25]. A pilot study involving 15 ankles reported an increase in mean VISA-A from 34.8 to 50.7 at six months [26]. These changes cannot establish an HA-specific effect without control groups.

A 2023 systematic review included only one Achilles trial among 19 trials of different soft-tissue conditions [27]. A 2026 scoping review continued to identify heterogeneous protocols and limited long-term comparative evidence [28]. Recent reviews therefore do not necessarily provide new Achilles-specific efficacy data.

Treatment decision: HA remains an insufficiently established adjunct. Optimal formulation, dose, injection number, anatomical target, durability, and uncommon harms remain uncertain. Clinical evidence does not establish tendon regeneration.

Discussion

The review informs five decisions: how to prescribe loading, reduce insertional compression, evaluate adjunctive procedures, interpret route-specific corticosteroid findings, and assess preliminary HA evidence. Across these decisions, treatment should aim to restore load tolerance and function. Imaging abnormalities alone do not establish symptomatic disease, and imaging normalization is not the primary treatment target [1–3].

Two distinctions are essential. First, treatment effects

depend on delivery and population: findings from one exercise regimen or injection protocol cannot be generalized to all rehabilitation or both disease phenotypes. Second, improvement after treatment does not establish incremental efficacy. Trials against loading alone, sham treatment, or an active comparator address different questions. Between-group estimates, confidence intervals, and clinical importance should guide interpretation; nonsignificance does not establish equivalence.

The evidence supports individualized loading and compression-reducing insertional rehabilitation, while limiting confidence in routine adjunctive procedures. Selective use should be tied to a specific objective, acknowledged uncertainty, and measurable outcomes. Foot orthoses for a coexisting foot problem represent an individualized clinical judgment; the positive corticosteroid trial supports a particular exercise-linked peritendinous protocol. Neither finding justifies unrestricted use [8,11,12,19].

Insufficient improvement after approximately 12 weeks should prompt review of diagnosis, adherence, actual loading, progression, and exercise range rather than automatic escalation. Surgery may be considered for persistent functional limitation after at least six months of active conservative care, following reassessment and discussion of benefits, complications, and uncertainty [2].

This narrative review is limited by selective retrieval, reliance on some abstracts, heterogeneous interventions, and overlapping evidence syntheses. It supports clinical decision-making rather than a definitive ranking of treatments. Future trials should distinguish phenotypes, standardize and report rehabilitation delivery, use credible controls, and assess sustained function, participation, and adverse events.

Conclusion and implications for practice

Education and individualized progressive loading remain first-line management, with compression-reducing modifications for insertional tendinopathy. Exercise selection should reflect tolerance, progression, and functional goals rather than contraction mode alone. Heel lifts and foot orthoses require a defined purpose and reassessment of benefit.

Current evidence does not support routine ESWT or PRP. Peritendinous corticosteroids may be considered selectively within a controlled rehabilitation protocol; HA requires stronger comparative evidence before routine adoption. Adjunctive procedures should support, rather than replace, active rehabilitation.

Persistent symptoms warrant diagnostic and rehabilitation reassessment before escalation. Twelve weeks is a review point, not a fixed recovery deadline. The treatment goal is restoration of plantar-flexor strength, tendon load tolerance, and participation in desired occupational and sporting activities.

Key clinical messages

- Distinguish midportion from insertional Achilles tendinopathy.
- **Diagnosis is primarily clinical:** Routine imaging is usually unnecessary.
- **Education and individualized progressive loading are first-line treatment:** Adjust resistance, range of motion, progression and recovery.
- **Reduce insertional compression:** Begin with floor-level heel raises and limited loaded dorsiflexion**.** Dose, progression, tolerance, and adherence require review.
- **Use inserts selectively:** Heel lifts and foot orthoses address different mechanical objectives and should not replace active rehabilitation.
- **Assess incremental benefit:** Current evidence does not support routine ESWT or PRP.
- **Specify corticosteroid delivery:** Positive findings concern peritendinous injection combined with controlled rehabilitation, not intratendinous injection or unrestricted activity.
- **Interpret HA cautiously:** Preliminary improvements do not establish comparative efficacy, tendon regeneration, or long-term safety.
- **Reassess before escalating:** Persistent symptoms warrant review of diagnosis, adherence, and loading; 12 weeks is a review point, not a recovery deadline.
- **Consider surgery selectively:** After at least six months of active conservative care.

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