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Insertional Achilles Tendinopathy Management: A Systematic Review

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ABSTRACT

Background: **Achilles tendinopathy is a common problem and its management remains controversial. However, many clinicians consider that the sub-group of patients with insertional Achilles tendinopathy are even more difficult to manage. The aim of this systematic review was to review evidence for interventions specific to insertional Achilles tendinopathy.** ***Materials & Methods:*** **Medline and the Cochrane library were searched using a pre-defined search strategy. All study designs were included except case studies, narrative reviews, technical notes and letters/personal opinion. The results were evaluated independently by two reviewers and assessed against the inclusion/exclusion criteria. All included articles were assessed for methodological quality and study characteristics were extracted into a table.** ***Results:*** **One hundred eighteen articles were identified through the search strategy, of which 11 met the eligibility criteria. Six studies evaluated operative techniques following failed conservative management and five evaluated conservative interventions only. The overall level of evidence was limited to case series evaluations and one randomized controlled trial.** ***Conclusion:*** **There is a consensus that conservative methods should be used before operative interventions. Current evidence for conservative treatment favors eccentric loading and shock wave therapy, although there is limited evidence by which to judge their effectiveness. Evaluation of operative interventions has been mostly retrospective and remains inconclusive.**

Level of Evidence: III, Systematic Review of Level III and IV Studies

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INTRODUCTION

Musculoskeletal conditions account for approximately 30% of all health care consultations.[13] The majority of these relate to 'soft-tissue' disorders, of which, those related to tendons are termed 'tendinopathies'. Some tendinopathies are related to systemic conditions such as seronegative arthropathies.[9] In many cases the exact aetiology remains unknown.[14] Achilles tendinopathy causes pain around the heel, that is diagnosed clinically through tendon pain, swelling and impaired function.[7]

A Cochrane review of Achilles tendinopathy management was published in 2001.[9] From nine randomized controlled trials (RCT's) no conclusions could be made regarding which interventions are most appropriate for this pathology. Furthermore, many of these reports contained both insertional tendinopathy (occurring at the bone tendon junction) and mid-substance/non-insertional tendinopathy (occurring more proximally). Since this publication has been recognized that these are distinct clinical entities and should be evaluated independently.[14]

Treatments for tendinopathies are wide ranging, and include but are not limited to orthotics, physiotherapy, laser treatment, ultrasound, extracorporeal shock wave therapy, NSAIDs, peritendinous corticosteroid injections, platelet rich plasma injections, high volume saline injection, eccentric loading, sclerosant injection and surgery. This wide range of treatments reflects the limited consensus among clinicians on how this pathology is best managed.[13]

This systematic review identified and summarized, from clinical studies, the evidence of effectiveness of different treatments for managing insertional Achilles tendinopathy. The purpose of the study was to evaluate, with regard to insertional Achilles tendinopathy, which interventions provide the greatest improvement in patient-reported pain and functional outcome.

MATERIALS AND METHODS

Inclusion criteria

All study designs were included except single-case studies, narrative reviews, technical notes and letters/personal opinion. Reports were included if they reported patients with insertional tendinopathy diagnosed clinically, through confirmation of posterior heel pain located at the bone-tendon junction, and also described the treatment method. Eligible studies had to report outcomes regarding function or pain scores.

Exclusion criteria

Articles were excluded if publications did not differentiate between insertional and mid-substance tendinopathy.

Search strategy

The databases searched were Medline (1950 to present) and the Cochrane Collaboration library. The search terms and strategy are shown in Table 1. The search was carried out in August 2009 using the OVID search engine. The reference lists of all papers identified were also hand-searched for other relevant papers.

Methods of review

Studies were independently assessed for inclusion by two reviewers (RK and MC). The reviewers evaluated all identified titles and abstracts independently and excluded any clearly irrelevant articles at this point. Studies including both insertional and non-insertional tendinopathies within their studies were excluded. The remaining articles were ordered in full and assessed against the eligibility criteria. Differences were resolved by discussion.

Table 1: Database Search Strategy and Results

	Search Terms	Results
1	exp Achilles Tendon/	4592
2	exp Tendinopathy/	5367
3	exp Chronic Disease/	187455
4	3 or 2	192524
5	insertional.mp. [mp=title, original title, abstract, name of substance word, subject heading word]	14413
6	retrocalcaneal.mp. [mp=title, original title, abstract, name of substance word, subject heading word]	117
7	bursitis.mp. [mp=title, original title, abstract, name of substance word, subject heading word]	2655
8	7 or 5 or 6	17089
9	4 and 1	710
10	8 and 9	118

Data was extracted from all included articles by the first reviewer and verified by the second reviewer. A data table was constructed to show study design, sample size, population characteristics, description of the intervention, followup period, outcomes assessed, and conclusions.

A narrative evaluation of methodological quality was performed for each included article including the method of recruitment, outcome measures used, identification of possible confounding factors, numbers of patients followed up and at what time points. Finally the external validity (the ease by which the results could be applied to the wider population) was evaluated.

RESULTS

One hundred eighteen articles were identified through the search strategy (Table 1). Of these 107 were excluded according to the pre-defined eligibility criteria: 35 did not describe patients with insertional tendinopathy, 47 did not define an intervention, 22 were single-case reports or narrative reviews, and two studies did not report the defined outcome measures. One further article, found within the German literature, was translated but appeared to be a report of the same series of patients published later in the English literature, and therefore excluded. Therefore, 11 articles[2−6,8,10,14−17] were included in this review and are summarized in Table 2.

Operative management

Six of the eleven articles included a sample of patients who had had failed conservative management before having surgery.[2,5,8,15−17] Of those studies five were retrospective case series and one was a prospective case series. They included patients who had symptom durations ranging from 6 weeks to 6 months. One study specified radiographic evidence of Haglund exostosis as an inclusion criteria and one specified heterotopic bone on radiograph.[2] The nature of the 'failed' conservative management was only briefly discussed by all six studies. In five of the series a 'single surgeon' performed the operations, limiting the external validity of the results.

Two of the studies described decompression of the retrocalcaneal bursa, one described reconstruction using FHL autograft, one described debridement with and without detachment and two described a central tendon splitting approach. None of the six articles evaluated their interventions at defined outcome points. The AOFAS was used by three of the six articles; however, this is not specific to Achilles tendon pathologies and the assessments were taken retrospectively, raising the possibility of recall bias among the patients.

All six articles reported 'good-excellent' results in relation to their outcome measures of pain and/or function. However,

Table 2: Study Characteristics

Reference	Study Design	Population	Intervention	Comparison	Outcome	Conclusions
Yodlowski, Scheller and Minos (17)	Retrospective case series	35 patients, symptoms longer than 6 months, no previous surgery, failed conservative management. Age 18 to 53 years.	Decompression of the retrocalcaneal bursa and the superior calcaneal tuberosity.	N/A	Pain score. Minimum followup 20 months.	Improved pain scores
Elias, Raikin and Besser et al. (2)	Retrospective case series	40 patients, symptoms longer than 6 months, failed conservative management, radiographic evidence of haglund exostosis and degenerative changes seen on MRI. Age 39 to 76 years.	Surgical reconstruction using FHL autograft	N/A	Strength, ROM, AOFAS, VAS, satisfaction. Minimum followup 18 months.	High percentage of satisfaction and good-excellent function.
Jonsson, Alfredson and Sunding et al. (6)	Prospective case series	27 patients, symptoms longer than 3 months, u/s assessment. Age 25 to 77 years.	Modified eccentric training program	N/A	Satisfaction and pain. Mean followup 4 months.	VAS scores reduced.
Rompe, Furia and Maffulli (14)	RCT	50 patients, symptoms longer than 6 months, no previous surgery. Haglund deformity presentation excluded.	Eccentric program	Shockwave therapy	VISA-A score. Fifteen months followup.	Both treatments resulted in improvement, more so in the shock-wave group.
Wagner, Gould and Kneidel et al. (15)	Retrospective parallel case series	22 in group one and 39 in group two. Symptoms longer than 6 weeks with heterotopic bone seen on radiographs and failed conservative managment.	Debridement with no/partial detachment of the tendon	Debridement with complete detachment along the V-Y lengthening of the tendon through the aponeurosis.	Pain relief and satisfaction. Minimum followup 1 year.	No difference between the groups.

Table 2: *continued*

Reference	Study Design	Population	Intervention	Comparison	Outcome	Conclusions
Furia (4)	Prospective parallel case series	47 in group one and 33 in group two. Symptoms longer than 6 months and radiographs confirming calcaneal spurs or calcifications. Age 21 to 80 years.	Shock wave therapy	Standard practice—non-operative management	VAS, Roles and Maudsley score. Followup 12 months.	Good to excellent results with shock wave therapy.
Johnson, Zalavras, and Thordarson (5)	Retrospective case series	25 patients. Symptoms longer than 2 months, pain at the insertion, failed conservative management.	Central tendon splitting approach.	N/A	Pain and function. Minimum followup 11 months.	Good relief of pain and good function
Fahlstrom, Jonsson and Lorentzon et al. (3)	Prospective case series	30 patients. Symptoms longer than 6 months	Eccentric program	N/A	12 week followup. Activity level and patient satisfaction.	Poor-good results.
Watson, Anderson, and Davis (16)	Prospective case series	22 patients. Had had previous failed conservative management.	Retrocalcaneal decompression	N/A	AOFAS, satisfaction and radiographs. At least 2 years.	All patients would 'recommend' the surgery to family.
Ohberg and Alfredson (10)	Prospective case series	11 patients. Pain on loading activities at the insertion, failed conservative managment. Age 24–67 years.	Sclerosing therapy	N/A	VAS, colour doppler. Mean followup 8 months.	Reduced pain and reduced neovascularization.
McGarvey, Palumbo and Baxter et al. (8)	Retrospective case series	21 patients. Pain at the insertion longer than 3 months. Age 30 to 77 years.	Central tendon splitting approach	N/A	Satisfaction and pain Mean followup 33 months.	82% satisfaction rate, 13/22 pain free.

none of the papers contained a comparison group by which to judge these results. These publications provide useful technical advice about the specific procedures, but do not provide any evidence regarding which operative technique provides better functional and pain outcomes following failed conservative management.

Non-operative management

The remaining five articles evaluated conservative strategies. There were three prospective case series, one prospective parallel-group case series, and one randomized controlled trial.[4,6,10,14] The duration of symptoms prior to the intervention ranged from a minimum of 3 months to a minimum of 6 months. One study excluded patients with Haglund deformity and one study excluded patients who did not have radiographic confirmation of a calcaneal spur.

The most commonly described conservative intervention was eccentric loading. Two prospective case series described a 'traditional' eccentric loading program, as first described by Alfredson et al.[1] and a modified version of the same program respectively. The traditional program demonstrated poor-good results based on activity level at 12 weeks. However this outcome measure is not validated and 12 weeks is a relatively short followup. The modified program reported significant reductions in pain in 67% of patients, measured using VAS. However, again the followup period was short (4 months) and the sample size small.

A third study also described a traditional eccentric loading program but compared this with shockwave treatment. This is the only RCT investigating insertional tendinopathy treatments. The RCT has a clearly defined population, intervention and comparison group and uses an Achilles tendon specific validated outcome score (VISA-A) taken at a specified time point by a blinded assessor. However, the method of randomization allocation through sealed envelopes is not ideal, and the sample size calculation was based upon the pain score and not the primary validated functional outcome score. Also, the analysis was based on outcomes at 4 months only. The authors concluded that both groups had decreased pain and increased function, but this was only statistically significant in the shockwave therapy group and not the eccentric loading group.

A second study described shockwave therapy compared to 'standard conservative practice'. However the group not receiving shockwave therapy was only excluded from the treatment because their insurance claim had been denied, which is a confounding factor regarding patient selection and may also have had a negative treatment effect due to the very fact that the patients had been denied the shockwave therapy. The followup period was over 12 months, but the outcome score was based on pain alone. However, the authors report significant decreases in pain in the shockwave group compared to the 'standard' group.

The final conservative treatment described for insertional Achilles tendinopathy is a small case series of eleven subjects managed with sclerosing injections. The authors used pain as the outcome measure, reporting a decrease in symptoms at a mean followup of 8 months. However, due to a small sample limited conclusions can be drawn from this study.

DISCUSSION

The aim of this systematic review was to evaluate the effect of treatment modalities for insertional Achilles tendinopathy in terms of functional outcome scores and pain scales. The wide variation in the criteria used to diagnose insertional tendinopathy and the equally wide range of functional outcome scores, prevented direct comparisons between interventions. However, some conclusions may still be drawn.

This review has demonstrated that there is a consensus among authors that conservative treatments should be tried prior to operative interventions. However there is no consensus regarding how long conservative interventions should be used before they are considered unsuccessful. Wagner et al.[15] deemed that 6 weeks of conservative management was long enough before proceeding to surgery, whereas others decided conservative methods needed to be tried for a minimum of 6 months.[2] There was also no consensus regarding what is considered adequate conservative treatment.

Conservative treatment ranged from eccentric loading to shock wave therapy and sclerosing injections. While eccentric loading was the most common treatment modality, the literature suggests that it may not be as successful in the treatment of insertional tendinopthy as it is in the treatment of mid-substance tendinopathy.[1] A RCT and parallel case series demonstrated that shock-wave therapy is an effective alternative to eccentric loading, although the conclusions that can be drawn from these studies is limited by some methodological inconsistencies and relatively small sample size. Neovascularization within tendinopathy is well documented[11] and sclerosing injections may be another alternative, but there is only one small pilot case series currently that evaluated this treatment.

Despite the range of conservative options available, a proportion of patients may eventually require surgery. Operative interventions range from debridement to reconstruction using FHL autograft. This review has highlighted the range of operative interventions available, but also exposed the lack of prospectively collected data and the infrequent use of validated outcome scores. The problems associated with retrospective case series data are well documented and therefore the results unreliable.[12]

CONCLUSION

This is the first systematic review of treatments for insertional Achilles tendinopathy. There is a consensus,

but limited evidence, that conservative methods should be used before operative interventions. The evaluation of conservative treatment has focused on eccentric loading and shock-wave therapy; both interventions demonstrating a degree of effectiveness in prospective case series and a single RCT. The evaluation of operative interventions is predominantly retrospective and inconclusive. Further research is required to determine the optimal treatment strategy for patients with insertional tendinopathy of the Achilles tendon.

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