

TENDINOPATHY RESEARCH UPDATE - FEBRUARY 2013

Contents

NORMAL TENDON & PATHOLOGY	1
The plantaris tendon in association with mid-portion Achilles tendinosis - Tendinosis-like morphological features and presence of a non-neuronal cholinergic system.	1
AETIOLOGY	2
DIAGNOSIS, ASSESSMENT	2
What is the best clinical test for Achilles tendinopathy?	2
IMAGING	3
MANAGEMENT	3
REHABILITATION & LOADING	3
PHYSICAL THERAPIES	3
MEDICINES AND INJECTIONS	3
Outcomes After Ultrasound-Guided Platelet-Rich Plasma Injections for Chronic Tendinopathy: A Multicenter, Retrospective Review	3
The role of platelets in the treatment of Achilles tendon injuries.	4
Effects of different platelet-rich plasma methods: letter to the editor.	4
The Use of Platelet-Rich Plasma in Sports Medicine—the International Olympic Committee Opinion	4
Cell therapy for the treatment of tendinopathy - A systematic review on the pre-clinical and clinical evidence.	5

NORMAL TENDON & PATHOLOGY

Histol Histopathol. 2013 Feb 4. [Epub ahead of print]

The plantaris tendon in association with mid-portion Achilles tendinosis - Tendinosis-like morphological features and presence of a non-neuronal cholinergic system.

Spang C, Alfredson H, Ferguson M, Roos B, Bagge J, Forsgren S.

Abstract

The plantaris tendon is often neglected in morphological/clinical studies on the lower extremity. There is, however, clinical evidence that the plantaris tendon is involved in cases with Achilles midportion tendinopathy/tendinosis. It is nevertheless unclear if the plantaris tendon exhibits tendinosis-like features in this situation. We therefore investigated the plantaris tendon of patients with midportion Achilles tendinosis when the plantaris tendon was found to be located very close to or invaginated into the Achilles tendon, a situation which very often has been found to be the case. There was a

very large number of tenocytes in the tendon tissue and the tenocytes showed abnormal and irregular appearances, exhibiting widened/rounded and wavy appearances, and were frequently lined up in rows. These features are characteristic features in Achilles tendinosis tendons. The tendon cells showed a distinct immunoreaction for the acetylcholine (ACh) -producing enzyme choline acetyltransferase (ChAT). Frequent fibroblasts were found in the loose connective tissue and these cells also showed a marked ChAT immunoreaction. The study shows that the plantaris tendon is morphologically affected in a similar way to the Achilles tendon in cases with midportion Achilles tendinosis and medial pain. The plantaris tendon may accordingly be a co-factor in these cases. The results also favour that there is a local ACh production both within the tendon tissue of the plantaris tendon and in the loose connective tissue. In conclusion, it is evident that plantaris tendons lying invaginated into or very close to the Achilles tendon in cases with midportion Achilles tendinosis show similar tendinosis features, as previously shown for the Achilles tendon itself in these cases.

AETIOLOGY

DIAGNOSIS, ASSESSMENT

Foot & Ankle Surg. 2013 online publication

What is the best clinical test for Achilles tendinopathy?

Hutchison AM, Evans R, Bodger O, Pallister I, Topliss C, Williams P, Vannet N, Morris V, Beard D

Abstract

BACKGROUND:

Differential diagnosis of Achilles pathology is demanding. This study evaluates the diagnostic accuracy of clinical tests identified for a chronic mid body Achilles tendinopathy. Ultrasound scanning provides the reference standard.

METHODS:

Twenty-one participants with, and without, an Achilles tendinopathy, had an ultrasound scan followed immediately by the application of ten clinical tests. The accuracy and reproducibility of each test was determined.

RESULTS:

The most valid tests are; pain on palpation of the tendon (sensitivity 84%, specificity 73%, kappa 0.74–0.96) and the subjective reporting of pain 2–6 cm above the insertion into the calcaneum (sensitivity 78%, specificity 77%, kappa 0.75–0.81).

CONCLUSION:

Only location of pain and pain on palpation were found to be sufficiently reliable and accurate, to be recommended for use.

IMAGING

MANAGEMENT

REHABILITATION & LOADING

PHYSICAL THERAPIES

MEDICINES AND INJECTIONS

Physical Medicine and Rehabilitation. 2013 Feb 8

Outcomes After Ultrasound-Guided Platelet-Rich

Plasma Injections for Chronic Tendinopathy: A Multicenter, Retrospective Review.

Mautner K, Colberg RE, Malanga G, Borg-Stein JP, Harmon KG, Dharamsi AS, Chu S, Homer P.

Abstract

OBJECTIVE:

To determine whether ultrasound-guided platelet-rich plasma (PRP) injections are an effective treatment for chronic tendinopathies.

DESIGN:

A retrospective, cross-sectional survey.

SETTING:

Four academic sports medicine centers from across the United States.

PATIENTS:

A total of 180 men and women between the ages of 18 and 75 years who received ultrasound-guided PRP injections for tendinopathy refractory to conventional treatments.

INTERVENTIONS:

Survey on satisfaction and functional outcome.

MAIN OUTCOME MEASUREMENTS:

Perceived improvement in symptoms at least 6 months after treatment, perceived change in visual analog scale score, assessment of functional pain, and overall satisfaction.

RESULTS:

On average, patients were 48 years old, had symptoms for a median of 18 months before treatment, and answered the survey on average 15 months after treatment. Overall, 82% of patients indicated moderate to complete improvement in symptoms. The most common injection sites were the lateral epicondyle, Achilles, and patellar tendons. Other sites treated included the rotator cuff, hamstring, gluteus medius, and medial epicondyle, among others. Furthermore, 60% of patients received only 1 injection, 30% received 2 injections, and 10% received 3 or more injections. Patients' perceived decrease in visual analog scale score was 75%, from 7.0 ± 1.8 to 1.8 ± 2.0 (-5.2 , SD 2.7, 95% confidence interval -5.65 to -4.86 , $P < .0001$). In addition, at follow-up, 95% of patients reported having no pain at rest that disrupted their activities of daily living and 68% reported no pain during activities. A total of 85% of patients were satisfied with the procedure.

CONCLUSIONS:

In this retrospective study, in which we evaluated administration of PRP for chronic tendinopathy, we found that the majority of patients reported a moderate (>50%) improvement in pain symptoms.

J Orthop Res. 2013 Jan;31(1):111-8. Epub 2012 Aug 6.

The role of platelets in the treatment of Achilles tendon injuries.

Sadoghi P, Rosso C, Valderrabano V, Leithner A, Vavken P.

Abstract

To systematically review the current in-vivo evidence for the use of platelet-concentrates (PRP) in the treatment of Achilles tendinopathy and Achilles tendon ruptures in animal models and human applications. A systematic search of PubMed, CINAHL, EMBASE, CCTR, and CDSR was performed for animal and human studies on the effect of platelet-concentrates in the treatment of Achilles tendinopathy and ruptures using the terms "Achilles tendon and platelet." The systematic search revealed a total of 149 papers. After excluding duplicates and cases of overlapping data, studies not focusing on in vivo evidence in terms of treatment or outcome, studies without any intervention, studies with unacceptable high attrition, one Chinese and one Swedish study, the remaining 14 manuscripts were included. The key finding of our study is evidence in support of a statistically significant effect of platelet concentrates in the treatment of Achilles tendon ruptures in vivo in animal models and human application, consistent with a medium to large sized effect. This effect is most likely attributable to fastened and enhanced scar tissue maturation. There was no evidence for a beneficial effect of platelets in Achilles tendinopathy.

Am J Sports Med. 2013 Feb;41(2)

Effects of different platelet-rich plasma methods: letter to the editor.

Murawski CD, Hofbauer M, Muller B, Fu FH, Mazzocca AD, Beitzel K.

Dear Editor:

We read with interest the recent article by Mazzocca et al titled "The Positive Effects of Different Platelet-Rich Plasma Methods on Human Muscle, Bone, and Tendon Cells."¹ We commend the authors on investigating an important topic and contributing much-needed basic science evidence on platelet-rich plasma (PRP) and its various methods of preparation.

Presently, there is not sufficient evidence to suggest that increased proliferation of muscle, bone, and tendon cells is a "positive" effect of PRP. In fact, we have encountered 3 cases with swelling or hypertrophy of the patellar tendon after PRP injection for patellar tendinopathy. These potentially negative effects have not yet been described, and we have recently submitted a report of these cases. Therefore, and based on the authors' conclusions, a more appropriate title may be "The Effects of ." or "The Proliferative Effects of Different Platelet-Rich Plasma Methods on Human Muscle, Bone, and Tendon Cells."

We must be cautious when defining something as a "positive" result without the appropriate basic science and clinical evidence to support it.

Christopher D. Murawski, BS Marcus Hofbauer, MD Bart Muller, MD Freddie H. Fu, MD, DSc (Hon), DPs (Hon) Pittsburgh, Pennsylvania

Operative Techniques in Orthopaedics Volume 22, Issue 1 , Pages 43-48, March 2012.

The Use of Platelet-Rich Plasma in Sports Medicine—the International Olympic Committee Opinion

L Engebretsen, P Schamasch

Semin Arthritis Rheum. 2013 Jan 28. [Epub ahead of print]

Cell therapy for the treatment of tendinopathy - A systematic review on the pre-clinical and clinical evidence.

Lui PP, Ng SW.

Abstract

OBJECTIVES:

This review aimed to summarize the current evidence on the safety/efficacy of cell therapy for the treatment of tendinopathy.

METHODS:

A systematic literature search was conducted using various databases with relevant keywords. Both original animal and human controlled studies, covering any cell type for the treatment of naturally occurring, overuse or collagenase-induced tendinopathy, and with full text available, were included. The quality of all included studies was assessed. Relevant data on study design, safety and efficacy outcomes were extracted.

RESULTS:

Eleven original studies were selected, of which nine were pre-clinical studies using the collagenase-induced tendon injury model and two were clinical studies. Types of cells, scaffolds, dosages and treatment regimens used varied. All the studies performed cell injection once. A critical appraisal of the included studies showed sub-optimal blinding. Cell therapy was generally reported to be safe, except minor complications, in the short term. Cell therapy was reported to improve tendon architecture in histology but equivocal finding was observed in sonographic/MRI examination, functional and biomechanical performance.

CONCLUSIONS:

The current evidence was inadequate to make a conclusion whether cell therapy was safe and effective. Further study with adequate sample size and follow-up time, appropriate controls and optimal blinding is required. Confirmation of finding, using different tendinopathy animal models, by systematic investigation of the effects of cell sources, dosages and regimens on the outcomes, and by the inclusion of tendon pain assessment in both animals and human, is recommended. Research on the mechanisms of how cell worked in tendon repair is essential.