



Systematic review on Platelet rich plasma in treatment of tendinopathies

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا

عِلْمَ لَنَا إِلَّا مَا

عَلَّمْتَنَا إِنَّكَ أَنْتَ

الْعَلِيمُ الْحَكِيمُ

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البقرة 32

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Dedication

To my father, my mother, my wife and

My son Omar.

*Those whom helped and encouraged me a lot during the
course of this work all my way through, I dedicate this
work,*

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List of Abbreviations

ABI	Autologous blood injection
ADL	Activities of daily life
b-FGF	Basic Fibroblast growth factor
CDU	Color Doppler Ultrasound
DASH	Disabilities of arm shoulder and hand
ECRB	Extensor carpi radialis brevis
EQ VAS	European quality of life visual analogue scale
ESWT	Extracorporeal shock wave therapy
FAOS	Foot and ankle outcome score
FDA	Food and drug administration
FU	Follow up
GTN	Gleceryl trinitrate
IGF	Insulin like growth factor
LLLT	Low level laser treatment
MRI	Magnetic resonance imaging
NO	Nitric oxide
NOS	Nitric oxide synthases
NP	Nucleus pulpousus
NS	Non-significant
NSAIDs	Nonsteroidal anti-inflammatory drugs
OA	Osteoarthritis
PDGF	Platelet derived growth factor
PPP	Platelet poor plasma
PRP	Platelet rich plasma
PRTEE	Patient related tennis elbow evaluation
QOL	Quality of life
RBCs	Red blood cells
RCT	Randomized controlled trial
rpm	round per minute

SLAP	Superior labrum anterior to posterior
TGF	Transforming growth factor
US	Ultrasonography
UTC	Ultrasonographic tissue character
VAS	Visual analogue scale
VISA (A or P)	Victoria institute of sport assessment (Achilles or patellar)
WBCs	White blood cells

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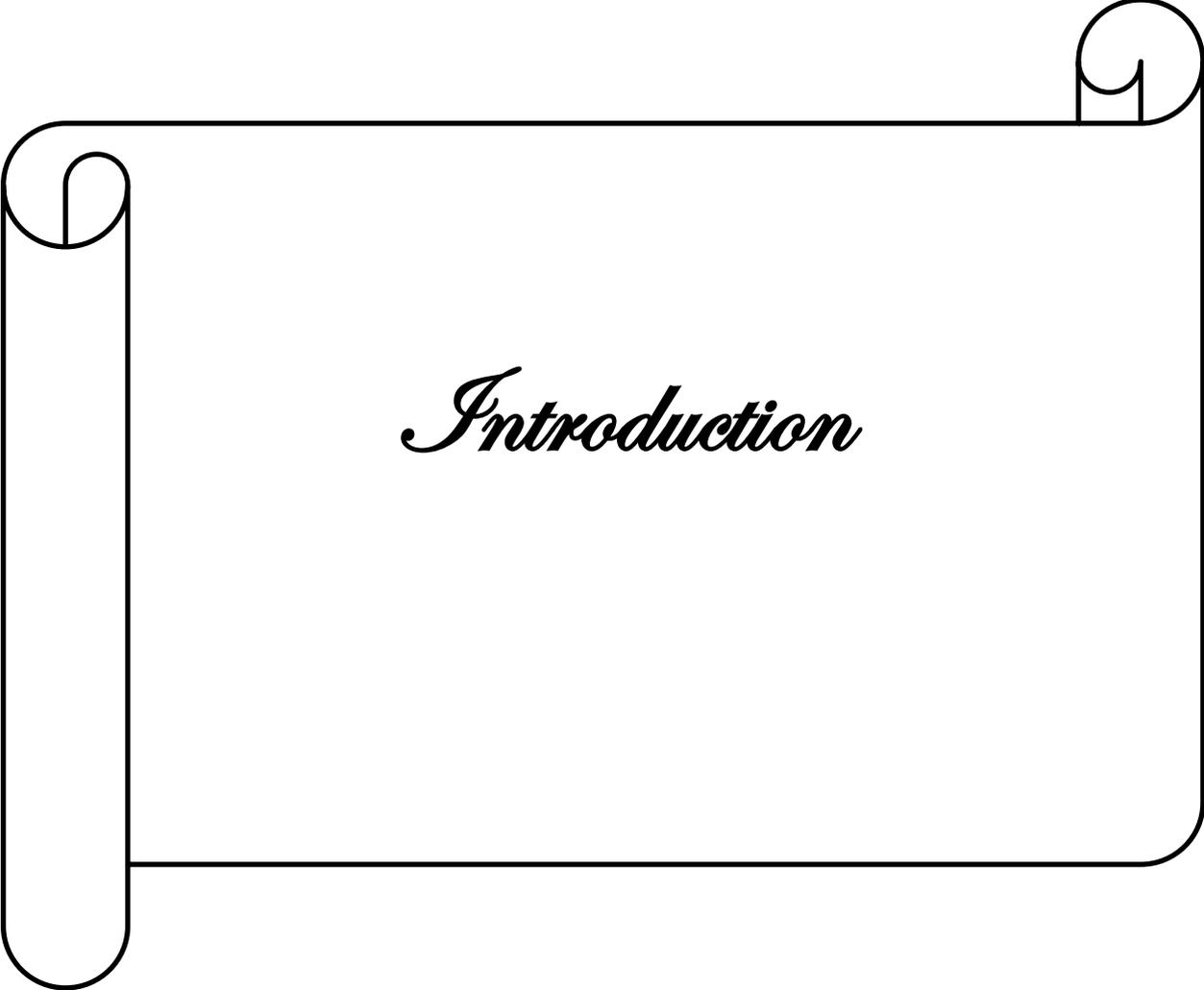
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Introduction

Introduction

Tendon pain is a very common condition. For example, in the general population, the life time cumulative incidence of Achilles tendinopathy is 5.9% among sedentary people and 50% among elite endurance athletes, and the overall prevalence of patellar tendinopathy in an athletic population has been reported to be in the range of 7–40%.^(1, 2)

Despite the frequency, there are still many unsolved questions and differences of opinion concerning pathology, pain mechanisms, etiology, and even terminology. Few years ago, the pain in chronic tendon overuse was believed to be due to a chronic inflammatory process, but because no inflammatory cells could be demonstrated in ruptured tendons, the opinion changed from inflammation “tendinitis” to degeneration “tendinosis”. A large amount of scientific data has so far not shown any direct evidence of inflammation in chronic tendinopathy.^(3, 4)

Today, most authors have even abandoned the “tendinitis myth”, However a significant reduction in pain and tendon thickening measured by ultrasonography (US),

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and an increased pain detection threshold measured by pressure algometry were found only one week after administration of ultrasound-guided peritendinous corticosteroid injections in chronic Achilles and patellar tendinopathy. These changes induced by corticosteroids are difficult to explain if the process is only degenerative.⁽⁵⁻⁷⁾

Tendinopathy is characterized by the gradual onset of morning stiffness in the tendon, decreased function, localized swelling, and sometimes neovascularization. Fibrin precipitated from the fibrinogen-rich fluid around the tendon can result in palpable crepitation.^(5, 8) The diagnosis can be made clinically and is verifiable by US or MRI.⁽⁹⁾

Treatment options are variable starting with decreasing activity, cold packs and the use of NSAIDs at the early acute stage.⁽¹⁰⁾ Exercise is important in both prevention and treatment of tendinopathy. Eccentric exercise therapy has been reported to have some effect in prospective, randomized trials in athletic patients⁽¹¹⁾ however, a review of 20 published trials found that there was little evidence of a positive effect on clinical outcomes, such as reduction of pain, return to function and patient satisfaction.⁽¹²⁾ Shock-wave therapy, which is thought to

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function on the tenocytes to stimulate repair, might be effective in a carefully selected group of patients.⁽¹³⁾ Other studies have reported no significant effect.⁽¹⁴⁾ Nitric oxide, applied using topical nitroglycerin patches, has been shown to improve outcomes in randomized, double-blind, placebo-controlled trials, possibly by enhancing collagen synthesis.⁽¹⁵⁾

It has been claimed that anti-inflammatory medication (nonsteroidal anti-inflammatory drugs or corticosteroid injections) would not benefit patients in the advanced stage of tendinosis as it is not an inflammatory disorder.⁽¹⁶⁾ The role of corticosteroid injections in the treatment of Achilles tendinopathy is controversial as there are insufficient published data to determine the comparative benefits and risks.⁽¹⁷⁾ In addition to the question of the efficacy of corticosteroid injections in the medium-term treatment of tendinopathy, there is a question of safety with using these medications in this setting. Several cases of Achilles tendon rupture have been reported after corticosteroid injections to this region.⁽²⁴⁾