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التوثيق الالكتروني والميكروفيلم

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THE EFFECT OF ULTRASOUND GUIDED PLATELET RICH PLASMA (PRP) INJECTION IN THE NON-SURGICAL TREATMENT OF PARTIAL SUPRASPINATUS TENDON TEAR

Thesis

Submitted for partial fulfillment of M.D.
in Radiodiagnosis

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2019

ACKNO

First and foremost, praise is to **Allah**, to whom I relate any success in achieving any work in my life.

I wish to express my deepest thanks, gratitude and appreciation to Prof. Dr. **Mohamed ElGareeb**, for his

sincere encouragement, constant advice and valuable guidance throughout the performance of this work.

I owe special thanks, gratitude and appreciation to Dr. **Wael Nassar,** for his close supervision, continuous advice and support which gave me the best guidance during different stages of this work.

I would like to thank Prof. Dr. **Ahmed Husein** and Dr. **Allam ElSayed** for giving me the opportunity to work with them and support me in different cases in this work.

Finally, I cannot forget to thank my professors, my family, and my colleagues, for their support and moral encouragement.

Mohamed Haroun, M.Sc.

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LIST OF ABBREVIATION

- **PRP:** Platelet-rich plasma
- **RC**: Rotator Cuff

- **PDGFs**: Platelet-derived growth factors
- **TGF**: Transforming growth factors
- **VEGF**: Vascular endothelial growth factor
- **EGF**: Epithelial growth factor
- **MRI: Magnetic Resonance Imaging**
- **US**: Ultrasound
- **RC-QOL: Rotator Cuff Quality of Life Score**
- **TrPs: Trigger points**
- **NSAIDs:** Non-steroidal anti-inflammatory drugs

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INTRODUCTION

Rotator cuff (RC) tears are the most common cause of shoulder disability with their prevalence ranging from 20 to 40% in the aging population. Degenerative changes and inflammation in the supraspinatous tendon is the most important causes of rotator cuff (RC) and shoulder pain. Muscular weakness and reduced mobility are common symptoms. Such pain and dysfunction are refractory to usual treatments and have become a challenge for physicians as to date; there is no gold standard treatment. **(Oliva F et**

al.,2014)

The current treatment of RC partial tearing are mainly conservative. Subacromial injection of anaesthetics or corticosteroids is often used to treat patients with persistent symptoms after rehabilitative therapy and use of oral non-steroidal anti-inflammatory drugs (NSAIDs). Although NSAID treatment and injections of corticosteroids are known to alleviate inflammation and shoulder pain, serious gastrointestinal side-effects after prolonged oral NSAID administration as well as arthropathic changes and increased tendon fragility caused by repeated corticosteroid injections are important concerns. **(Mautner K et al.,2014)** The rotator cuff is limited in its ability to regenerate due to poor vascularization of the tendon tissue. Interest has increased in providing endogenous growth factors directly to the ligament and tendon injury site. Testing of platelet-rich plasma, the bioactive component of whole blood, is being conducted in various fields of medicine to aid in regeneration of tissue with poor healing potential. **(Ahmad Z et al.,2013)**

Recently, new evidences have emerged on the effectiveness of platelet-rich plasma injection (PRP) in the treatment of tendinopathies such as lateral epicondyle extensor tendinopathy, patellar tendinopathy, Achilles tendinopathy and supraspinatous tendinopathy. (**Rha DW et al.,2013)**

PRP is an autologous concentration of platelets obtained by whole blood

centrifugation with specific protocol. The supernatant includes several growth factors such as platelet-derived growth factors (PDGFs) alpha, beta, transforming growth factors (TGF) beta 1 and beta 2, vascular endothelial growth factor (VEGF), and epithelial growth factor (EGF) which can play role in tendon healing. For instance, PDGF plays a role in cell differentiation and neovascularization, TGF stimulates tendon differentiation and formation of collagen, EGF induces fibroblast proliferation, and VEGF stimulates neovascularization.(**Eppley BL et al.,2014)**

During recent years, clinicians tend to use PRP in tendinopathies more due to the lower risk of complications such as gastrointestinal problems and tendon tearing occurring with this method in comparison to other conservative methods. The aim of the present study was to determine the effectiveness of PRP administration in patients with partial tearing of RC. (**Eppley BL et al.,2014)**

Given that the suggested therapeutic effects of PRP cover the symptoms of RC disease, we considered whether PRP might be effective for treating RC disease. In this thesis, we try to study the therapeutic effects of PRP injection in patients suffering shoulder pain owing to partial supraspinatous tendon tear. We hypothesized that PRP injection at the site of a supraspinatus lesion would reduce pain and improve the range of motion of the shoulder significantly

with healing of minor degrees of partial tear.

AIM / OBJECTIVES

To highlight the effectiveness of ultrasound guided PRP injection in patients with partial tearing of supraspinatous muscle tendon.

ANATOMY

The supraspinatus muscle is one of the musculotendinous support structures called the rotator cuff that surrounds and enclose the shoulder. It helps to resist the inferior gravitational forces placed across the shoulder joint due to the downward pull from the weight of the upper limb.

The supraspinatus also helps to stabilize the shoulder joint by keeping the head of the humerus firmly pressed medially against the glenoid fossa of the scapula.

The **rotator cuff** is a group of four muscles and their tendons, important in stabilizing the glenohumeral joint:

- Supraspinatus: abduction
- Infraspinatus: external rotation
- Teres minor: external rotation
- Subscapularis: internal rotation

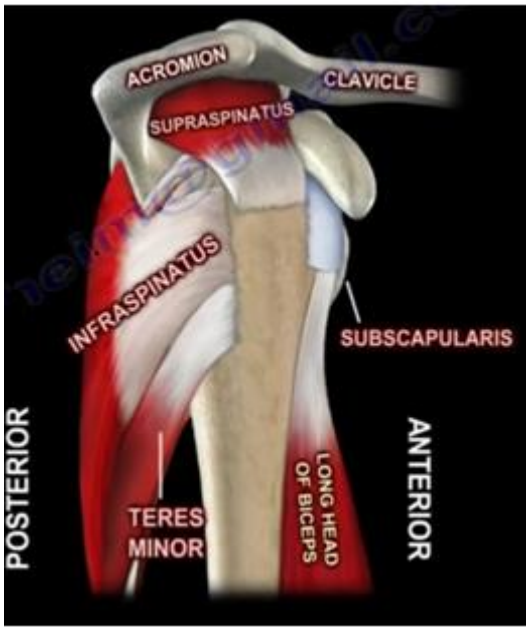

Figure (1): showing anatomy of RC muscles , (Imaging Atlas of Human Anatomy 2013)

Other structures that stabilize the glenohumeral joint include joint capsule and ligaments (coracohumeral ligament and glenohumeral ligaments: superior, middle and inferior). **(Schünke et al., 2010)**

Supraspinatus is located deep to the trapezius muscle in the posterior scapular region, extending from the supraspinous fossa of scapula to the proximal humerus.