Role of Diagnostic Ultrasonography in Rehabilitation of Ankle Sprain in Athletes

Thesis

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دور اشعة الموجات الفوق صوتيه التشخيصية في تأهيل اصابة التواء الكاحل للرياضيين

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Contents

List of Abbreviations

AITFL..... Anterior Inferior Tibiofibular Ligament
ATFL..... Anterior Talofibular Ligament
BMI..... Body Mass Index
CAI..... Chronic Ankle Instability
CFL.....Calcaneofibular Ligament
CT..... Computerized Tomography
FAI .....Functional Ankle Instability
HVPC..... High-Voltage Pulsed Current
IOL ..... Interosseus Ligament
IOM ..... Interosseus Membrane
LCL ..... Lateral Ankle Ligament Complex
MHz .....Mega Hertz
mm ..... millimeter
mmHg..... millimeter Mercury
MRI..... Magnetic Resonance Imaging
MSU..... Diagnostic Musculoskeletal Ultrasound
NSAIDs..... Nonsteroidal Anti-Inflammatory Drugs
OLT ..... Osteochondral Lesion of the Talus
PITFL..... Posterior Inferior Tibiofibular Ligament
PTFL..... Posterior Talofibular Ligament
RICE ..... Rest, Immobilization, Compression, Elevation
ROM ..... Range of Motion
RTP .....Return to Play
SPSS..... Statistical Package for Social Sciences
TENS ..... Transcutaneous Electrical Nerve Stimulation
US ..... Ultrasound
VAS ..... visual Analogue Scale

List of Table

List of Figures

Introduction

In this day of an active society, musculoskeletal injuries are becoming more prevalent. The foot and ankle are among the most common sites for acute and chronic injuries in athletes and other physically active individuals ***(Hootman et al., 2007 and O'Driscoll et al., 2011)***.

Ankle sprains are common injuries that occur during physical activity, it constitute 85% of all ankle injuries and are the most frequently seen musculoskeletal injury seen by primary care providers ***(Hauser et al., 2010 and Young et al., 2013)***. It occurs with an incidence of one sprain per 10,000 people per day ***(Veillette, 2012)***. Ankle sprain is one of the most common sport-related injuries, which result in lost participation ***(Hertel, 2002)***. Sprained ankles have been estimated to constitute up to 30-40% of all injuries seen in sports medicine clinics ***(Young et al., 2013)***. Ankle sprain results in disability and time lost from work and activity resulting in an estimated 1.2 million physician visits per year ***(Sefton et al., 2009)*** and 12% of time lost in football is due to ankle injuries ***(Chan et al., 2011)***. Therefore, it is important to determine appropriate means of preventing these injuries.

The lateral ankle ligament complex includes the anterior talofibular ligament (ATFL), the calcaneofibular ligament (CFL), and the posterior talofibular ligament (PTFL). The ATFL is the weakest of the 3 lateral ankle

ligaments and is most frequently injured in ankle sprains ***(Ferran et al., 2009 and Chinn & Hertel, 2010)***.

Eighty percent of acute ankle sprains make a full recovery with conservative management, while 20% of acute ankle sprains develop mechanical or functional instability that ends in chronic ankle instability (CAI) ***(Chan et al., 2011)***. When ankle sprain occurs, damage not only occurs to the structural integrity of the ligaments but also to various mechanoreceptors in the joint capsules, ligaments, and tendons about the ankle complex ***(Olmsted et al., 2002)***.

The optimal treatment for ankle sprains remains uncertain. Ankle sprains are not similar, and may present with a variable clinical course. Neuromuscular functional training is aiming to restore joint range of motion, improve muscle strength & neuromuscular coordination of the ankle and return to functional level. A balance training program will significantly reduce the risk of ankle sprains ***(McGuine & Keene, 2006)***.

Predicting the time that an athlete can return to unrestricted sport activities following his injury remain significant challenge. There is no specific time frame that sprained ankle recover. The ligaments take at least six weeks to heal but muscle strength, ROM, proprioception and return to function can vary considerably ***(Miller, 2017)***. The estimate of when to return to play using clinical and

imaging techniques helps to stand the specific therapy and how long it might take for full recovery.

Musculoskeletal diagnostic ultrasound (MSU) is a simple, inexpensive, rapid and easily reproducible examination tool ***(Lento & Primack, 2008)*** and can serve as an excellent imaging modality for musculoskeletal disorders ***(Khoury et al., 2007)***. MSU has been advocated for the evaluation of acute and chronic ankle ligament injuries because it allows noninvasive and dynamic assessment of the ankle ***(Mei-Dan et al., 2009 and Chan et al., 2011)***. The diagnostic accuracy for ATFL tears by ultrasound is 95% and for CFL tears is 90% ***(Peetrons et al., 2004)***.

Aim of the work

This work is aiming to:

- Detect the value of diagnostic musculoskeletal ultrasound as assessment tool of ankle sprains in athletes.
- Assess the improvement of rehabilitation of ankle sprain in athletes using diagnostic musculoskeletal ultrasonography.

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