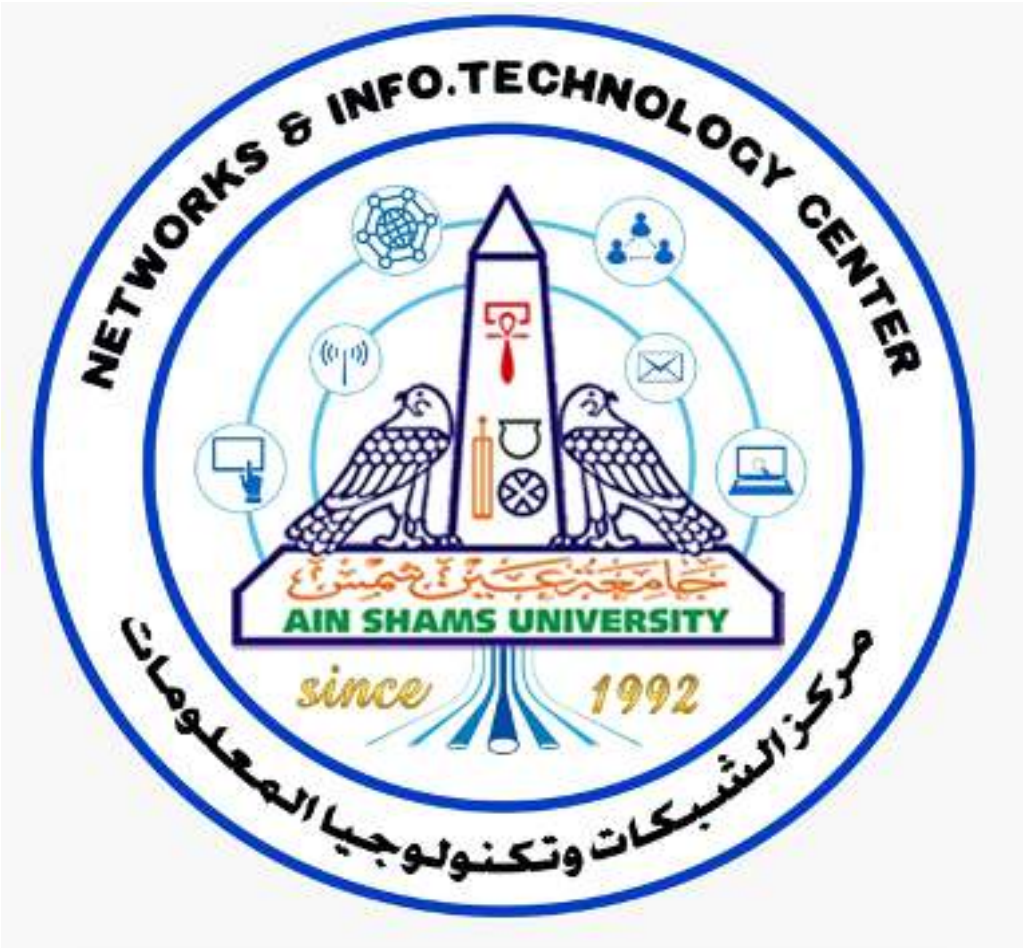
Safaa Mahmoud

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

Role of Ultrasound in Assessment of Menisco-Ligamentous Injury around Knee Joint in Comparison with Magnetic Resonance Imaging

Thesis

Submitted for Partial Fulfillment of Master Degree in Radiology

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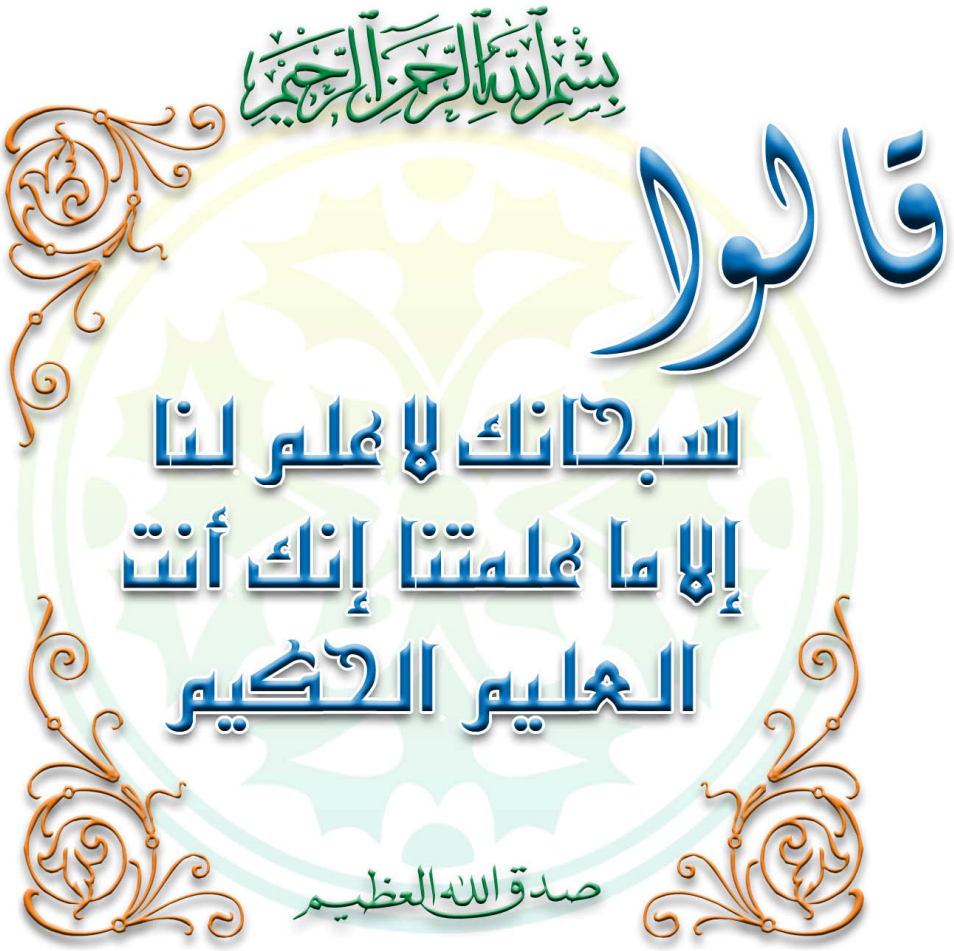
2019



سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to ***ALLAH,*** *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to ***Prof. Dr. Marwa Ibrahim Fahmy,*** *Professor of Radiodiagnosis, Faculty of Medicine- Ain Shams University for his keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to ***Dr. Khaled Ahmed Mohamed Ali,*** *Lecturer of Radiodiagnosis, Faculty of Medicine, Ain Shams University, for his kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I would like to express my hearty thanks to all ***my family*** *for their support till this work was completed.*

Last but not least my sincere thanks and appreciation to all patients participated in this study.

Sally Mohamed Ahmed Hussein

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List of Abbreviations

Abb.	Full term
ACL	*Anterior cruciate ligament*
AHLM	*Anterior horn lateral meniscus*
AHMM	*Anterior horn medial meniscus*
US	*Ultrasound*
MRI	*Magnetic Resonance Imaging*
LCL	*Lateral collateral ligament*
MCL	*Medial collateral ligament*
MRI	*Magnetic resonance imaging*
PCL	*Posterior cruciate ligament*
PHLM	*Posterior horn lateral meniscus*
PHMM	*Posterior horn medial meniscus*
ITB	*Iliotibial Band*
FOV	*Field of View*

Abstract

The purpose of this study is to demonstrate the role of ultrasonography for diagnosis of meniscal and ligamentous injuries in patients with knee pain and compare its diagnostic accuracy to MRI.

The ultrasound results evaluated the presence of meniscal or ligamentous tear by the presence or abscence of any hypo echoic band or stripe that can be seen within the meniscus or ligaments.

From our study the following conclusion can be derived:

US is highly sensitive and specific in detection of meniscal tear as well as the detection on collateral ligaments injury in correlation to MRI. While it is less sensitive but still specific in detection of cruciate ligament injury in correlation to MRI so, they can be used as non invasive method for screening of patients with knee pain for meniscoligamentous injuries.

Keywords: Magnetic Resonance Imaging - Anterior cruciate ligament - Ultrasound

INTRODUCTION

The knee joint is a type of compound synovial joints. The ligaments constitute the major supporting framework of the knee joint. Due to limited bony support, stability of the joint is highly dependent upon the ligaments, cartilages, tendons and menisci and the same are more prone to injuries ***(Singh et al., 2016).***

Knee injuries are common, especially when taking part in sports. Injuries to soft tissues, such as ligaments, cartilage and tendons are commonly encountered. Damage to the bone also can occur. One of the most common mechanisms for knee injury is direct trauma, which is commonly seen in athletic injuries ***(Kapur et al., 2009).***

Clinical examination even by the most experienced staff using the strictest of clinical methods is not always enough to diagnose knee injuries. Arthroscopy has been considered as the gold standard for the diagnosis of knee injuries, but is invasive, expensive and requires day surgery admission ***(Singh et al., 2016).***

Magnetic resonance imaging (MRI) is now the non invasive gold standard for the diagnosis of knee injuries, a wide variety of MRI pulse sequences can be performed to produce diagnostic quality images. These include T1, proton density, T2, spin echo, fast (turbo) spin-echo, and gradient-echo sequences, which all have been proven suitable for knee imaging.

However, there are significant limitations of using MRI, such as the presence of cardiac pacemakers, metal implants, patient intolerance due to claustrophobia and delay in treatment due to long wait periods also it is of high cost ***(Potter, 2012).***

Ultrasonography (US) is a becoming a leading imaging modality in the evaluation of the musculoskeletal system as it is readily available and economical. US evaluates the fibrillar anatomy of muscles, tendons and ligaments. Other advantageous of US are ability to compress, dynamically assess structures and compare easily with the contralateral side. There have been studies done in the past that evaluated the accuracy of either US or MRI in detection of knee injuries and only few studies compared these two methods ***(Amandeep et al., 2018).***

As a result, recent studies have demonstrated point-of-care ultrasound as an alternative, non-invasive and real-time imaging modality to evaluate the soft tissue pathology of the knee, including injuries to the menisci and ligaments ***(Razek et al., 2009).***

There are also limitations to using ultrasound. There is a relatively steep learning curve and dependence on the training, skill, and experience of the operator ***(Lee et al., 2001).***