



**Sudan University of Sciences and Technology**  
**College of graduate studies**



**StudyOfCorrelationBetween Clinical Data and Magnetic  
Resonance ImagingFindings InKnee Joint Injuries**

**دراسة العلاقة بين البيانات السريرية ونتائج التصوير بالرنين المغناطيسي في اصابات  
مفصل الركبة**

**A thesis submitted for partial fulfillment M.Sc. Degree in diagnostic Radiologic  
Imaging**

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**Proof.**

# **ication**

*To my family*

*To my husband*

*To my Teachers*

*To my friends and colleagues*

# Acknowledgments

Thank my God who enable me to realize the genuine meaning of success, ambitious living my dream come through and giving me.

My gratitude to my supervisor **Dr. Duha Abdu Mohammed**, she did not hesitate to devote her knowledge and time for me,

I also grateful acknowledge the help of the staff of Alyaa specialized hospital, for my dear NOUR TAHA for their role in collection of data.

Special thanks to everyone participated in this work by any way either encourages advising or appreciating our research.

## **Abstract**

The objective of this study is to determine the relationship between the request for clinical examination form of magnetic resonance imaging of the knee joint and the final diagnosis.

The problem of research is not to write enough clinical data for patient which negatively affect the diagnosis.

The data were collected and analyzed by (SPSS) number of patient studied (80) patient.

The study showed that there is no relationship between sign & symptoms that the patient complained about and the final diagnosis value = (0,538), while there was a relationship between suspected pathology and final diagnosis ( $p=0.014$ ).

This study recommended that the requests for knee joint must be written by physician with sufficient clinical data to aid technologist in selecting proper MRI protocol and help the radiologist for write the report.

## خلاصة البحث

الهدف من هذه الدراسة هو معرفة العلاقة بين طلب الفحص السريري للتصوير بالرنين المغناطيسي لمفصل الركبة والتشخيص النهائي بعد عمل الصور. مشكلة البحث تكمن في عدم كتابة المعلومات السريرية الكافية للمرضي مما تؤثر سلبا على التشخيص.

تم جمع البيانات ومن ثم تحليلها عن طريق برنامج (spss)

عدد المرضي الذين شملتهم الدراسة (80) مريض.

اظهرت الدراسة ان لالعلاقة بين الاعراض التي يشكو منها المريض والتشخيص النهائي وكانت القيمة المعنوية لهما بعد التحليل الاحصائي = (.538). بينما وجدت علاقة بين التشخيص المبدئي حسب توقع الطبيب بعد اجرا الفحص السريري اللازم للمريض والتشخيص النهائي بعد عمل الصور وبعد التحليل الاحصائي وجدت القيمة المعنوية لهم = (.14).

اوصت هذه الدراسة ان يكون طلب فحص الرنين المغناطيسي يحتوي على البيانات السريرية الكافية للمريض وذلك لمساعدة التقني في اختيار البروتوكول المناسب لعمل الصور وبالتالي المساعدة في التشخيص الدقيق.

## List of contents

Content	Page
آية	I
Dedication	II
Acknowledgments	III
Abstract in English	IV
Abstract in Arabic	V
List of content	VI
List of figures	VIII
List of tables	XI
Abbreviations	X
Chapter one	
1.1. Introduction	1
1.2. Problem of the study	2
1.3. Objectives of the study	2
1.3.1. General objectives	2
1.3.2. Specific objectives	2
1.4. Thesis out line	3
Chapter two	
2.1. Theoretical background	4
2.1.1. Anatomy	4
2.1.1.1. Bone	4
2.1.1.2. Capsule	4
2.1.1.3. Meniscus	4
2.1.1.4Ligament	6
2.1.1.5Bursa	7
2.1.1.6Muscles	7
2.1.1.7 Blood supply of the knee	8

2.1.2 Pysiology	9
2.1.3Pathology	10
2.1.4Physics of Magnetic Resonance Imaging (MRI)	11
2.1.5MRI of knee joint	14
2.1.5.1Indiction of knee joint MRI	14
2.1.5.2Contraindication	15
2.1.5.3Protocol of knee	17
2.1.5.3.1Patient position	15
2.1.5.3.2Equipment	15
2.1.5.3.3 Portocole	17
2.1.5.4Limitation of magnetic Reasons Image	19
2.2Previous study	20
Chapter Three	
3. Material and Methods	22
3.1. Materials	22
3.1.1. Patient	22
3.1.2. Machine	22
3.2. Methods	22
3.2.1. Preparation for the knee MRIscan	22
3.2.2. Patient position	23
3.2.3. Protocol	23
3.2.4. Data collection	23
3.2.5.Area and duration of the study	23
3.2.6. Data analysis and presentation	23
Chapter four	
4. Results	24
Chapter five	
5.1 Discussion	33

5.2 Conclusion	35
5.3 Recommendations	36
References and resources	37
Appendices	



## List of figures

Figure name	Page
Figure (2-1): shows anatomy of the knee on lateral aspect	5
Figure (2-2): ): shows anatomy of the knee on anterior aspect	5
Figure (2-3): shows ligament of knee joint	7
Figure (2-4): shows tendons & quadriceps muscles	8
Figure (2-5): shows function of knee joint	9
Figure (2-6): shows designed of resistive magnet	12
Figure (2-7): shows designed of superconducting magnet	13
Figure (2-8): shows closed MRI machine	15
Figure (2-9): shows knee coil	16
Figure (2-10) :The position of patient	16
Figure (2-11):shows & lable sagital T1 w image of knee joint	17
Figure (2-12): shows MRIimage coronal proton density of knee joint	17
Figure (4-1): illustrate gender	24
Figure (4-2): illustrate Signs and ymptoms	26
Figure (4-3): illustrate suspected pathology	27
Figure (4-4): illustrate the diagnosis	28
Figure (4-5): illustrate the relation between diagnosiss and sign&symptoms	30
Figure (4-6): ): illustrate the relation between diagnosiss and suspected pathology	32

## List of tables

<b>Table name</b>	<b>Page</b>
Table (4-1): shows frequency distribution of patients according to gender	24
Table (4-2): shows frequency distribution of according to age group	25
Table (4-3): shows frequency distribution of patient according to sign&symptoms	25
Table (4-4): shows frequency distribution according to the suspected pathology	26
Table (4-5): shows frequency distribution according to MRI diagnosis	27
Table (4-6): shows relationship between diagnosis and sign&symptoms	28
Table (4-7): shows relationship between diagnosis and suspected pathology	31

## Abbreviations

Abbreviation	Meaning
MRI	Magnetic resonance imaging
MCL	Medial collateral ligament
LCL	Lateral collateral ligament
ACL	Anterior cruciate ligament
PCL	Posterior cruciate ligament
NMR	Nuclear magnetic resonance
GRE	Gradient echo
FSE	Fast spin echo
SE	Spin echo
PD	Proton density
TR	Repetition time
TI	Inversion time

# **Chapter One**

## **Introduction**

## **Chapter one**

### **Introduction**

#### **1-1Background**

The Knee is the largest joint in the human body and is considered the most complicated one .physiologically it enables hinge and rotating movement as the connection between the upper and lower leg.(ivysports medicine,2004)

Magnetic resonance imaging (MRI)is atest done with a large machine that uses a magnetic field and pulses of radio wave energy to make pictures of the knee ,muscles, legaments, cartliges and other joint structures are often best seen with an MRI.(health wise,2015)

This study provide ,referrals for MRI will only be accepted on an appropriate request for ,referring clinicians must confirm that ,there are no contraindication to MRI for their patient before referred. Ensure the patient is identifiable name, date of birth, address ,ensure clinical details conform to those in the referral guidelines ,if they do not or these is insufficient information for the practitioner then the examination may not be performed.(south tess hospitals NHs,2015)

## **1-2problem:**

In same requested form witch is sended to the MRI department is not satisfy and not filed by clinical data and patient history ,not revealing that clinical examination results , so it is not informative results ,absence of ideal MRI request form lead to misdiagnosis ,the technologist must be inform about the patient history by full description of clinical examinations results some exams need to apply additional plus sequence or specific protocols according to the available clinical information.

## **1-3 Objectives:**

### **1-3-1 General objectives:**

To Study of Correlation between clinical data and magnetic resonance imaging findings in knee joint injuries.

### **1-3-2 Specific objective**

1-To detrmine the percentage of the reported MRI examination with sufficient clinical data.

2-`To determine the percentage of the reported MRI examination without sufficient clinical data.

3- To findout the relation between reported MRI examination with and without sufficine clinical data.

## **1-4 Thesis outline**

Chapter one:Consist of Introduction, statement of the Problem, Objectives of the study ,and Thesis outline.

Chapter two:The Theoretical Background and Previous studies.

Chapter three: Methodology and Data analysis.

Chapter four: Result.

Chapter five: Discussion, Conclusions ,Recommendation, Appendix and References.

# **Chapter Two**

## **Theoretical Background**

## Chapter Two

### 2.1. Theoretical background

#### 2.1.1. Anatomy

The knee joint is one of the complex and strongest is the most important joint in the human body . movement out the knee joint are essential to many every day activities including walking , running , sitting and standing ,it allows the lower leg to move relative to the thigh while supporting the body's weight, the knee also as known as the tibiofemoral joint is a synovial hinge joint .(innerbody .1999-2014).

##### 2.1.1.1. Bones:

The knee joint formed between there bone , the femur , tibia and patella . tow rounded , convex processes,(known a condyles) on the distal end of the femur meet two rounded , concave condyles at the proximal end of the tibia, the patella lies in front of the femur on the anterior surface of the knee with it, smooth joint forming processes on it posterior on it posterior surface facing the femur.(platzer et al, 2004) .

##### 2-1-1-2 Capsule :

The joint capsule surround , the bones of the knee to provide strength and lubrication the outer layer of the capsule is made from fibrous connective tissue continues with the ligaments of the knee to hold the joint in place , oil synovial fluid is produced by the synovial membrane, that lies joint capsule and fills the hollow space between the bone .(platzer, et al, 2004)

##### 2-1-1-3 Meniscus:

Thin layer of hyaline cartilage , between the femur and tibia is figure – eight – shaped layer of tough ,rubber , prevent the collision of the leg bone during strenuous activities such as running and jumping..(platzer,et al, 2004)



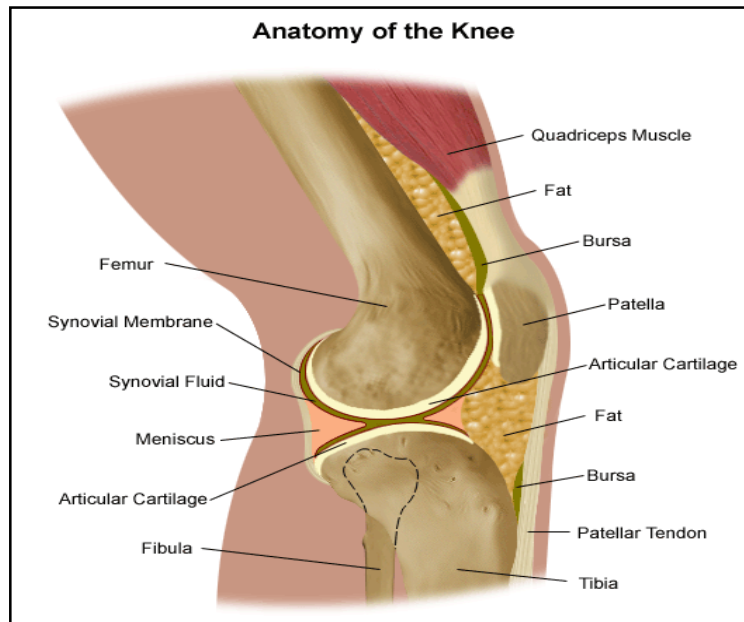


Figure (2-1) shows anatomy of knee on lateral aspect.

[www.urmc.rochester.edu](http://www.urmc.rochester.edu)



Figure(2-2) shows anatomy of knee joint on anterior aspect .

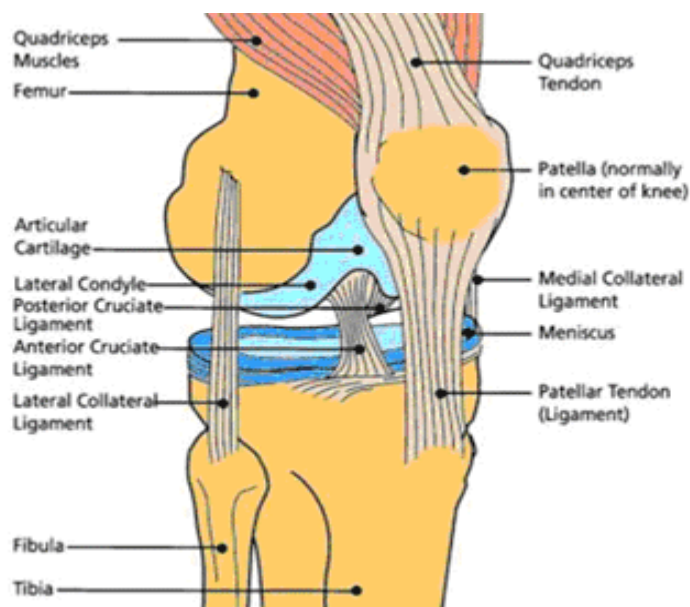
[www.aclsolutions.com](http://www.aclsolutions.com)

#### **2-1-1-4 Ligament:**

Many strong ligament surround the joint capsule of the knee to reinforce its structure and hold its bones in proper alignment.

On the anterior surface of the knee, the patella is held in place by the patellar ligament, which extends from the inferior border of the patella to the tibial tuberosity of the tibia. Posteriorly, the oblique popliteal ligament and acute popliteal ligament join the femur to the tibia and fibula to the lower leg. Along the medial side of the knee, the medial collateral ligament (MCL) connects the medial side of the femur to the tibia and prevents forces applied to the lateral side of the knee from moving the knee medially. The lateral collateral ligament (LCL) binds the lateral side of the femur to the fibula and prevents forces applied to the medial side of the knee from moving the knee laterally. The ACL and PCL also help to maintain the proper alignment of the knee. The anterior cruciate ligament is the most anterior of these internal ligaments and extends obliquely from the inner surface of the lateral condyle of the femur to the anterior intercondylar space of the tibia. The ACL prevents hyperextension of the knee by limiting the anterior movement of the tibia.

Behind the ACL is the posterior cruciate ligament, which extends obliquely from the inner surface of the medial condyle of the femur to the posterior intercondylar space of the tibia. The PCL prevents the posterior movement of the tibia relative to the femur. (Platzer, et al, 2004)



Figure(2-3) show ligament of knee joint on anterior aspect([www.epomedicine.com](http://www.epomedicine.com))

### **2-1-1-5 Bursa:**

Small pockets of synovial fluid surround the knee , reduce the friction from movement of tendons across the surface of the joint .

Several of these bursae, including the suprapatellar bursa, are instrumental in the reduction of friction between the patella and femur. Pockets of adipose tissue around the knee known as articular fat pads, help to cushion the knee from external stress.

The largest of these pads, the infrapatellar fat pad , absorb shock to the anterior surface of the knee cushions the patellar ligament as it moves with the patella during flexion and extension of the knee.(Platzer et al,2004)

### **2-1-1-6 Muscles:**

The knee muscles which go across the knee joint are quadriceps and the hamstring ,the quadriceps muscles are on the front of the knee and the Hamstring are on the back of the knee ,plus tendons connect the knee bones to the leg muscles that move the knee joint (Platzer et al, 2004).



Figure (2.4) show tendons & quadriceps muscles([www.ohiodance.org](http://www.ohiodance.org))

### 2-1-1-7 Blood supply of the knee:

Two major vascular structure, the popliteal artery and vein , are located with in the poplitea fosa as the posterior aspect of the knee , another prominent vessel is the great (sephanous vein ) which ascends , the medial aspect of the leg and thigh , to drain into the femoral vein near the hip joint( platzer , et al,2004)

### 2-1-2 physiology

It is attached The primary functional role of the patella is knee extension. The patella increases the leverage that the tendon can exert on the femur by increasing the angle at which it acts.

To the tendon of the quadriceps femurs muscle, which contracts to extend/straighten the knee. The patella is stabilized by the insertion of the horizontal fibers of vast us medial's and by the prominence of the lateral femoral condyle, which discourages lateral dislocation during flexion.

The retinacular fibers of the patella also stabilize it during exercise.(PLTZOR,et al,2004)

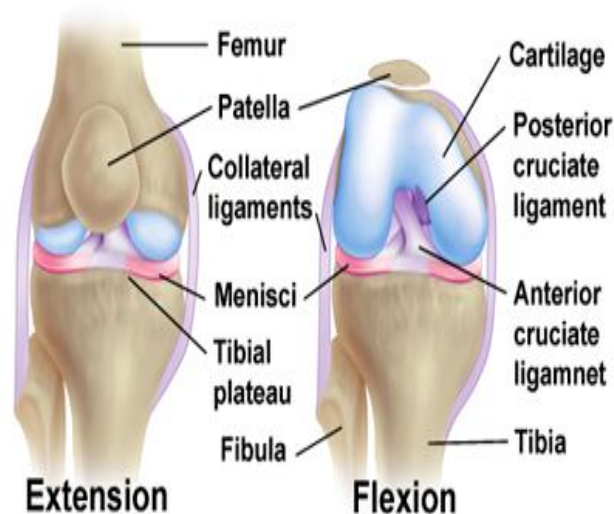


Figure (2-5) Shows function of knee joint ([www.yoursurgery.com](http://www.yoursurgery.com))

### 2.1.3. Pathology

There are several diseases and problems associated with knees. To find out more about any particular problem included in :

-ACL Tears:

Tears of the ligament deep inside the knee. Common in athletes.

-Collateral Ligament Tears:

Tear of the ligament on the outside or inside of the knee.

-Chondromalacia Patella:

Also known as "anterior knee pain"; a very common cause of pain on the front of the knee and around the kneecap (patella).

-Dislocating Kneecap (Patella):

The kneecap pops out of place, usually to the outside of the knee.

-Bursitis:

Inflammation on the front of the knee.

-Tendonitis:

Irritation of the tendons around the knee.

-Arthritis:

A very common disease in patients over the age of 45.

-Loose Body:

Usually happens after trauma, this is a loose piece of cartilage/bone in the knee.

-Baker's Cyst:

Swelling in the back of the knee.

-Meniscus Tear:

Very common cause of knee pain. Tear of one of the special cartilages in the knee.

-Infection:

Bacterial infection of the knee. Very serious.

#### **2-1-4 Physics Of Magnetic Resonance Imaging (MRI)**

Clinical Magnetic Resonance Imaging (MRI) uses the magnetic properties of hydrogen and its interaction with both a large external magnetic field and radio waves to produce highly detailed images of the human body. In this first module, we will discuss some basic principles of magnetism, the magnetic properties of the hydrogen nucleus, and its interaction with the externally applied magnetic field ( $B_0$ ), in its early days, MRI was known as NMR, this stands for NUCLEAR Magnetic Resonance. Although the name has changed (primarily due to the negative connotation of the word “nuclear”), the basic principles are the same. We derive our images from the magnetic resonance properties of nuclear particles (specifically hydrogen). (Fauker. et al. 1996).

In order to perform MRI, we first need a strong magnetic field. The field strength of the magnets used for MR is measured in units of Tesla. One (1) Tesla is equal to 10,000 Gauss. The magnetic field of the earth is approximately 0.5 Gauss. Given that relationship, a 1.0 T magnet has a magnetic field approximately 20,000 times stronger than that of the earth. The type of magnets used for MR imaging usually belongs to one of three types; permanent, resistive, and superconductive. (Fauker. et al.

1996). A permanent magnet is sometimes referred to as a vertical field magnet. These magnets are constructed of two magnets (one at each pole). Advantages of these systems are:

- 1- Relatively low cost.
- 2- No electricity Or cryogenic liquids are needed to maintain the magnetic field.
- 3- Their more open design may help alleviate some patient anxiety.
- 4- Nearly nonexistent (Fauker, et al. 1996).

Fringe field. It should be noted that not all vertical field magnets are permanent magnets. Resistive magnets are constructed from a coil of wire. The more turns to the coil, and the more current in the coil, the higher the magnetic field. These types of magnets are most often designed to produce a horizontal field due to their solenoid design. As previously mentioned, some vertical field systems are based on, resistive magnets.

The main advantages of these types of magnets are:

- 1- No liquid cryogen.
- 2- The ability to “turn off” the magnetic field.
- 3- Relatively small fringe field. Below is an example of a vertical field resistive system:



Figure (2-6) showed designed of resistive magnet

Superconducting magnets are the most common. They are made from coils of wire (as are resistive magnets) and thus produce a horizontal field. They use liquid helium to keep the magnet wire at 4 degrees Kelvin where there is no resistance. The current flows through the wire without having to be connected to an external power source. The main advantage of superconducting magnets is their ability to attain field strengths of up to 3 Tesla for clinical imagers, and up to 10 Tesla or more for small bore spectroscopy magnets. Below is an example of a superconductive MR system: (fauker, et al 1996)



Figure(2-7) showed designed of superconducting magnet

#### **2-1-5 MRI of knee joint:**

The bones comprising the knee joint show normal configuration and position , the bone marrow signal is normal , with a normal trabecular pattern and normal epiphysis lines ,the cortex shows smooth contours and normal thickness' with no sub –chondral signal change.

The cartilage covering the patella , femoral condyle , and tibia plateau is of normal thickness' and has normal signal characteristics, the cartilaginous surface is smooth , the medial and lateral meniscus of the



knee joint present a normal triangular configuration on axial image and have a homogenous internal structure of low signal intensity, the anterior horn , mid portion and posterior horn each display a smooth , intact surface, the anterior and posterior cruciate ligament are intact and are normal in their width and signal characteristics, the collateral ligament are intact and of normal width, the soft tissue surrounding the knee joint and image vascular structure are unremarkable , (torsten,1999,emil reif,200)

### **2-1-5-1 Indication of knee MRI**

In conjunction with conventional x-ray, MRI is usually the best choice for examine the body's major joint like the knee, the examination indicated to:

- Knee pain , weakness , swelling or bleeding in the tissue in and around the joint
- Sport related knee injuries
- Build up of fluid in the knee joint.
- Sign&symptoms related to implanted surgical device.
- Internal derangement of the joint ( menisci tear , ligament tears , post repair cruciate ligament tears bursae)
- Chondromalacia patella and patella tracking.
- Bone tumor and bony damage within the knee joint .
- All most and another knee disorder can well be visualized(radiologyinfo-org,2014).

### **2-1-5-2:Contraindication**

- Patient have claustrophobia (fear of enclosed space) or anxiety.
- Any metal and electronic object such as (jewelry, watch).
- Patient with the following implant cannot be scanned and should not enter the MRI scanning such as (cochlear, aneurysm , pacemaker). (radiology info-org,2014).

## **2-1-5-3 Protocol OF KNEE**

### **2-1-5-3-1PATIENT POSITION:**

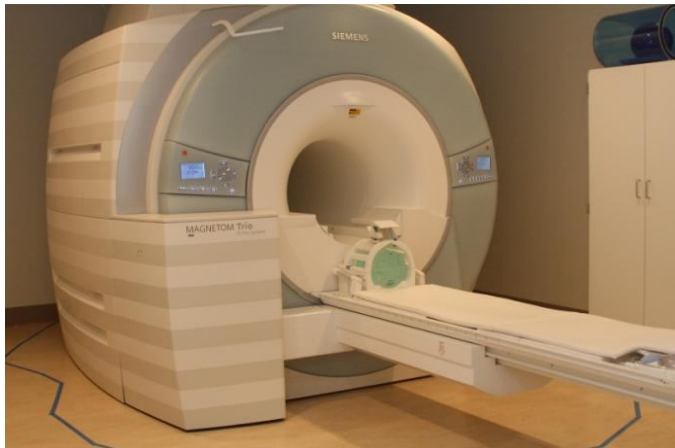
The patient lies supine on the examination couch with their knee in a relaxed ,slightly flexed position within the coil. The knee is well immobilized with pads.

### **2-1-5-3-2 EQUIPMENT:**

Knee coil.(surface coil or body coli).

Ear plague (Catherin westbook,1998)

Immobilization pads.



Figure(2-8) showed closed MRI machine semen's modelComposed of gantry &couch([www.imgarcade.com](http://www.imgarcade.com))



Figure(2-9) showed knee coil ([www.imgarc](http://www.imgarc))



Figure(2-10) showed posing of patient lying supine on the couch by using closed magnet MRI([www.durangoorhopedic.com](http://www.durangoorhopedic.com))

**2-1-5-3-3 Protocole:**

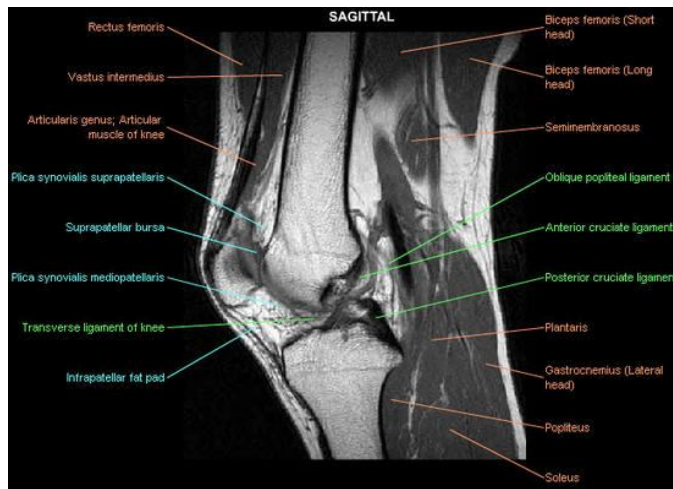
Axial/ multiplanar coherent gradient echo t\*2.-

Sagittal coherent GRE t\*2.-

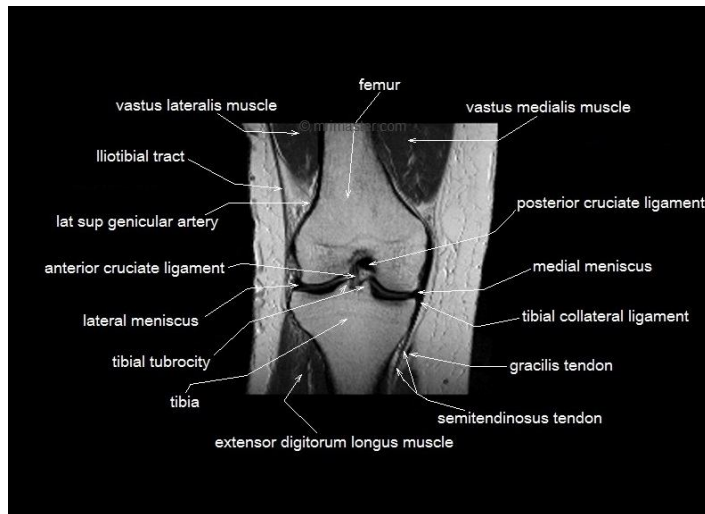
Coronal FSE pd/t2 +/- chemical / spectral presaturation / stir .-

Choronal SE/incoherent (spoiled) GRE t1.-

-Axial FSE pd/t2 +/-chemical /spectral presaturtion. (Catherin westbook,1998).



Figure(2-11) showed &label sagittal T1Wimage of knee joint MRI([www.imaios.com](http://www.imaios.com))



Figure(2-12)label show MRI image coronal proton density of knee joint(. [www.iage.fromp.com](http://www.iage.fromp.com))

**2-1-5-3-4 Additional séquence:**

- Axial SE/FSE t1.
- 3D coherent GRE pd/t\*2.
- Dynamic imaging. (Catherin westbook,1998)

**2-1-5-3-5 Sequence and parameter used:**

Spain – echo sequence have been the workhorse in MRI evaluation of knee disorder,fast scan imaging (T\*2-stir-gradient) generated higher signal than on T2 weight Spain echo , it replacement him, my be used in any situation in which it my be desirable.

T1weight image are satisfactory for the demonstrate of the most commonly in counted pathological, when selecting the parameter for T1WI sequence , the TR should be shorter because this speed up the examination and the signal – to noise ratio is satisfactory for resolution of any abnormality , if using very short TR is that the number of slice available for the sequence will decreased,another technique would be to plane gaps between the slice, there by allowing the limited number of slice variable to cover large region , the abnormality in the area between

slice will be messed if the gaps are too large if used should be small and that the TR should be long enough to provide an adequate number of slice to cover the entire region, and this improved the signal to noise ratio. another parameter used selection of coil, important to satisfactory image, if used body coil have found that smaller gaps, will produce more than satisfactory image, for clinical use with surface coils, also important to affect to the knee near the magnet is center because signal intensity tend to drop off the further away the knee placed.

Slice thickness is an important parameter to consider when very thick slice are utilized, details may be lost and lower signal-to noise ratio although this problem may be compensated for by using interleaved sequence or by implying gaps, another way to improve the signal to noise ratio would be to increase the number of excitations however this may increase examination time, for this reason very thin slice should not be utilized with conventional spin-echo sequence.

Matrix size is yet another parameter that impinge in significant manner both signal to noise ratio and resolution.

The use of large matrix, however increase the amount of time required to complete an examination, with the use of smaller matrix, resolution is satisfied, the signal to noise ratio is improved.

T2 weighted image spine-echo image are increasingly useful such as in the examination of partial tear, some centers routinely use T2\*-weighted sequence situation in which fast scan image cannot be obtained T2 weighted sequence. (Peter et. al 1999).

#### **2-1-5-4 Limitation of Magnetic Resonance Imaging:**

- Person who is very large may not fit into the opening of conventional MRI machine.

- The presence of an implant or other metallic object, sometimes makes it difficult to obtain clear image and patient movement can have the same effect as safety devices-

-MRI typically costs more and may take more time to perform than other modalities.(RADIOLOGY INFO-ORG -2014)

## **2-2 Previous study:**

-Hyayat ahmed et.al( 2017) had studied about correlation between magnetic resonance imaging and arthroscopicThe clinical examination is an important and accurate diagnostic modality for evaluation of traumatic derangement of the knee joint. It is noninvasive, easy, available, and valuable diagnostic modality. The MRI is an accurate diagnostic modality. It can be used whenever there is an uncertain indication for arthroscopy. However, costs have to be kept in mind, especially in patients with low socio-economic status.

-Sahil,et al( 2013) study about the correlation between clinical, magnetic resonance imaging (MRI), and arthroscopic diagnosis in knee injuries Our conclusion is that carefully performed clinical examination can give equal or better diagnosis of meniscal and ACL injuries in comparison with MRI scan. MRI may be used as an additional tool for diagnosis.

-Royal Australian and New Zealand College of Radiologists,(2011) mention can expect more clinically relevant reports when they ask specific clinical question and provide diagnosis or differential diagnosis based on clinical diagnosis in the referral requests.

-NHS, 2011 mention the referral for MRI will only be accepted on an appropriate requested form, ensure clinically details conform to those in the referral guidelines if they do not or there is insufficient information for the practitioner then the examination may not be performed.

- Beter ,et al( 2006)To prospectively evaluate the association between clinical features and structural abnormalities found at magnetic resonance

(MR) imaging in patients with osteoarthritis (OA) of the knee diagnosis of this study indicate that only two associations exist between clinical symptoms and structural diagnosis found on MR images in patients with OA of the knee.

# **Chapter Three**

## **Material and Methods**



## Chapter three

### Material and Method

This study is descriptive and analytic study.

#### **3-1 material:**

##### **3-1-1 patient:**

This study include 80 patients referred to MRI scan for knee joint age between (10-70) year 16 females 64 males.

##### **3-1-2 machine:**

-Toshiba - open magnetic field (1,5)T  
-phased array coil.

#### **3-2 method:**

##### **3-2-1 preparation for the knee MRI scan:**

The data were collected from the patient referred to MRI scan for knee joint before scan there found in the department questioners form give to patient by assistant for field, after this enter the patient on waiting room for complete the procedure, the assistant measure the weight and height of patient , asked him to remove anything containing metal (dentures, hearing aid , hair pins, body jewelry, ear ring , etc),

##### **3-2-2 Patient position:**

Patient lies supine on the couch , with feet first and the knee under the coil protect ear of patient by used ear plug from gradient coil noising, after that closed the door for complete scan then from computer consult chose the protocol used according to technologists

##### **3-2-3 Protocol:**

(-axial STIR + proton density, sagittal T1, sagittal T2 ,sagittal STIR, coronal T1, coronal T2, coronal STIR)

#### **3-2-4 Data collection:**

The data was collected by data collection sheets which designed to satisfy all variable include (sign& symptoms-gender-age-diagnosis result).

#### **3-2-5 Area and duration of study:**

Aliaa Specialist Hospital, period from 5 to12/2016 The study was done on.

#### **3-2-6 Data analysis and presentation:**

Descriptive statistic using statistic packages for social science( SPSS) and was presented as tables and figures.

# **Chapter four**

## **Results**

## Chapter four

### Result

Table (4-1) distribution the gender:

Gender	Frequency	Percent
Male	63	78.8
Female	17	21.3
Total	80	100.0

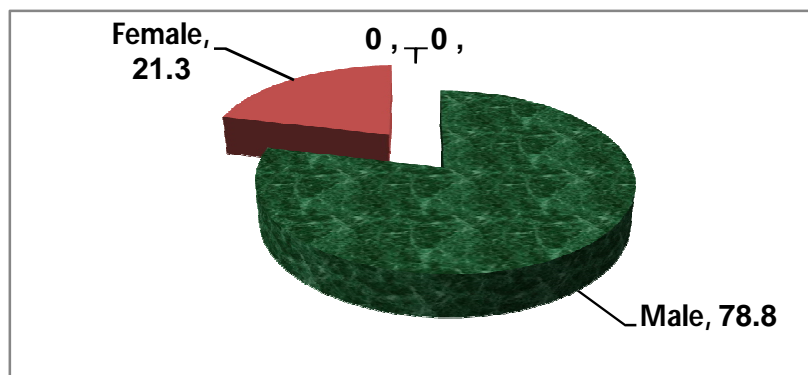


Figure (4-1) illustrate the male and female frequency.

Table (4-2) shows frequency distribution of patients according to age group

Age group	Frequency	Percent
10-20	6	7.5
20-29	20	25.0
30-39	15	18.8
40-49	15	18.8
50-59	15	18.8
60-70	9	11.3
Total	80	100.0

Table (4-3) shows frequency distribution of patients according to sign&symptoms:

Sign&symptoms	Frequency	Percent
Trauma	26	32.5
Pain	22	27.5
RTA	7	8.8
Swelling	6	7.5
Injury	3	3.8
Ruptured meniscus	2	2.5
Others*	5	6.3
No clinical data	9	11.3
Total	80	100.0

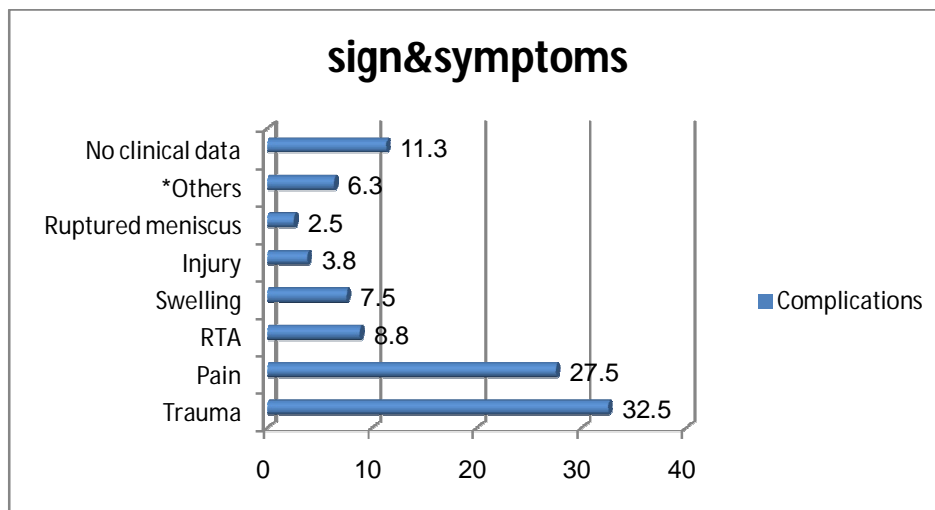


Figure (4-2): illustrate signs and symptoms

Table(4-4) shows frequency distribution of patients according to the suspected pathology:

Suspected pathology	Frequency	Percent
Meniscus tear	7	8.8
ACL tear	2	2.5
Ligament tear	2	2.5
Tendon tear	2	2.5
Baker's cyst	1	1.3
Total	14	17.5

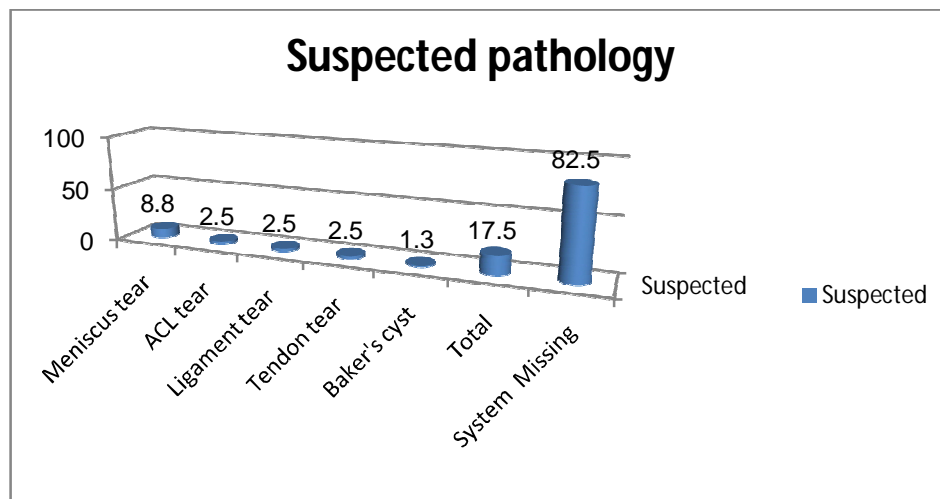


Figure (4-3): illustrate the suspected pathology

Table (4-5) shows frequency distribution of patients according to the diagnosis:

Diagnosis	Frequency	Percent
Effusion	10	12.5
Meniscus tear	19	23.8
Contusion	2	2.5
Osteoarthritic changes and Baker's cyst	3	3.8
Normal MRI of the knee joint	2	2.5
2 and 1	30	37.5
Malignant soft tissue mass	1	1.3
Osteoarthritic changes	6	7.5
1 and quadriceps tendon tear	1	1.3
Fracture and 1	6	7.5
Total	80	100.0

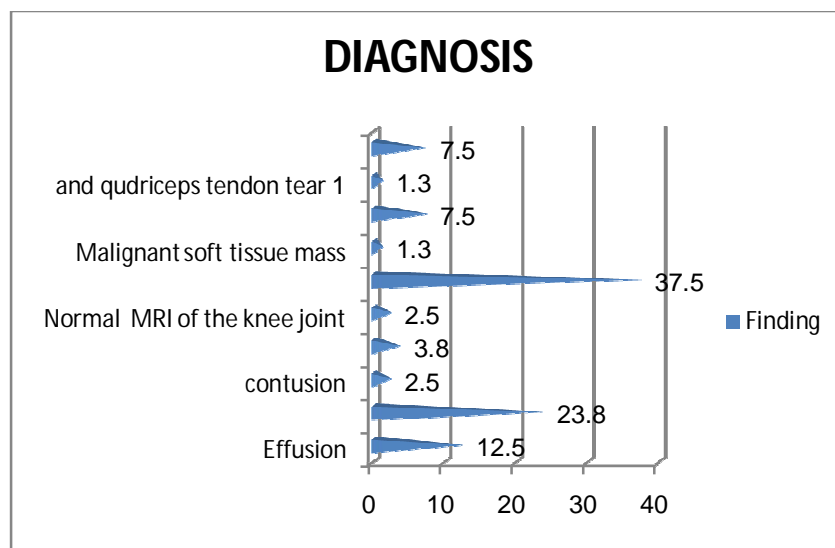


Figure (4-4): illustrate the MRI diagnosis

Table (4-6): shows relationship between Diagnosis \* Sign&symptoms

Table (4-7): shows relationship between diagnosis and suspected pathology

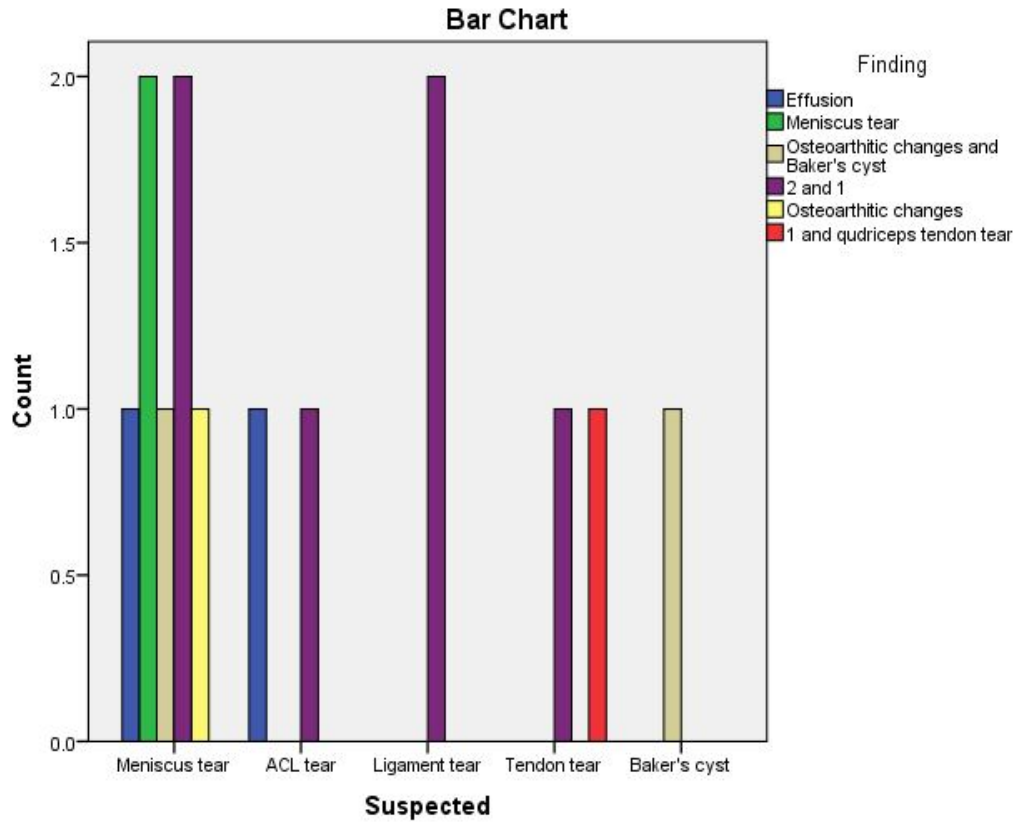


Figure (4-6): illustrate the relation between diagnosis and suspected pathology



**Chapter Five**  
**Discussion & Conclusion**  
**& Recommendations**

## Chapter five

### Discussion&Conclusion&Recommendation

#### 5-1 Discussion:

On table (4-1) about gender , the result founded that the frequency of males is 63 and have percentage 78.7% will more than females is 17 and have percentage is 21.3 % .

And table (4-2) about the age resulting that the age between (10-19)y have 6 frequency and 7.3%, and largest frequency between (20-29)y is 20 frequency and 25%, (30-39)y and (40-49)y and (50-59)y is 15 has respectively percentage 18.8% and middle frequency (60-70) y is 9 frequency and 11.3%.

Table (4-3) discusses the sign& symptoms were the patient referred to scan , which all have percentages, trauma 32.4% , pain 27.5% , RTA 8.8% , swelling 7.5% , injury 3.8% , rupture meniscus 2.5% , and other sign& symptoms 6.3% , plus patient have no clinical data 11.3%

In this study trauma have largest frequency , this is result similar to (Hyate Ahmed et al, 2017) mention that .

Table (4-4) discussed the suspected pathology as the opinion of doctor , according to sign&symptoms of patient mention on 14 requested form , included frequency and percentage for meniscus tear 7 and 8.8%, ACL tear , ligament tear , tendon tear , respectively 2 and 2, 5% baker cyst 1 and 1 , 3% , then from this the meniscus tear have largest frequency , where 66 requested form have insufficient data .

And table (4- 5) discusses the final diagnosis , pathology which appearance in the image on last exam , have frequency and percentage meniscus tear and effusion 30 and 37.5%, meniscus tear 19 and 23.8% , effusion 10 and 12.5% , contusion 2 and 2.5% , meniscus tear and effusion 30 and 37.5% , OA change 6 and 7.5% , and normal MRI of knee joint 2 and , 2.5%

Effusion and quadriceps tendon tear 1 and 1.35%, fracture and effusion 6 and 7.6%

Our study showed that the meniscus tear and effusion have largest frequency ,and similar result study of (sahil, et al 2013) .

Table (4-6) discusses the relationship between final diagnosis and sign& symptoms at p-value (  $p= 0,538$ ) there is no significant different at.

As shown in Table (4-7) ) discusses the relationship between final diagnosis and suspected pathology cases., significant difference ( $P=0.014$ ) was noticed

## **5-2 Conclusion:**

This study about correlate the patient clinical data in requested form with the final diagnosis in knee joint MRI examination , the gals of this study to researcher about important of righter clinical data in the requested, which help technologist for any changer could happen in the protocol whish improve the diagnosis , and help the radiologist for rewriter the report.

The result founding ,the sign &symptoms were the patient cam to MRI scan is trauma 32.4% and suspected pathology were opinion of doctor is meniscus tear 50% on 14 requested form and the final diagnosis in the last imaging is meniscus and effusion 30%and the correlation between final diagnosis and sign &symptoms at p-value (  $p= 0,538$ ), diagnosis and suspected pathology at p – value (  $p= (P=0.014)$ ).

Conclusion that in our study there is no relationship between the final diagnosiss and sing & symptoms ,but there is a relation ship between suspected pathology and final diagnosiss of MRI knee joint

### **5-3 Recommendation:**

- Recommend researching this topic with increasing the number of sample .
- Requested form must include signs and symptoms and suspected pathology of opinion doctor. .
- ensure clinically details conform to those in the referral request form

#### 5-4 Reference:

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# Appendix

