

SPECTRUM OF MAGNETIC RESONANCE IMAGING FINDINGS IN KNEE TRAUMA.**Dr. SUMIT PATIL¹ , Dr. SUSHANT BHADANE² , Dr. MEENAL MOHGAONKAR³ , Dr. AMOL JAGDALE⁴ , Dr. DEVENDRA KULKARNI⁵**

¹Junior resident 3, Department of Radiology, SMBT IMS & RC NASHIK.

²PROFESSOR AND H.O.D., Department of Radiology, SMBT IMS & RC NASHIK.

³PROFESSOR AND DEAN, Department of Radiology, SMBT IMS & RC NASHIK.

⁴PROFESSOR, Department of Radiology, SMBT IMS & RC NASHIK.

⁵ASSISTANT PROFESSOR Department of Radiology, SMBT IMS & RC NASHIK.

Email: patilsumit983@gmail.com

INTRODUCTION :

Knee injuries are among the most common injuries in the world population. Approximately 50% of injuries are related to sporting or recreational activities, with soft-tissue injuries accounting for the majority of knee injuries .⁽¹⁾

In this article we will review the imaging evaluation of knee injuries resulting from RTA, sports activities, fall ,trauma. We will review the pertinent anatomy and the imaging appearances of specific ligamentous and meniscal injuries in the preoperative setting. MRI, due to its excellent soft tissue contrast resolution and multi-planar imaging capabilities, provides significant advantages over other imaging techniques in the evaluation of traumatic conditions of knee joint.⁽²⁾

MRI depicts most components of the joint, including articular cartilage, menisci, intra-articular ligaments, bone structure abnormalities.⁽³⁾

AIMS AND OBJECTIVES**AIM:**

To describe the magnetic resonance imaging findings in knee trauma.

OBJECTIVES:

- I. To categorize the various form of injuries involving lateral tibiofemoral, medial tibiofemoral patellofemoral joints, the anterior and posterior cruciate ligaments, and the medial and lateral collateralligaments injury.
- II. To determine proportion of different MRI features seen in causing traumatic knee join

MATERIALS AND METHODS

Study Design

Descriptive cross-sectional

Source of data

Patients coming to the department of Radio-diagnosis, Tertiary Health Centre. Participant size – 40

Inclusion criteria

Patients with unilateral or bilateral traumatic knee referred to Department of Radiology for MRI study of knee joint.

Patient of all age group and both sexes are included in study.

Exclusion criteria

Aneurysmal clips and cochlear implant.

Patients on cardiac pace maker.

Patients with claustrophobia.

Pregnancy.

APPARATUS AND MATERIALS

The examination will be performed by using GE MR 355 1.5 Tesla with dedicated knee coil as both All patients fulfilling the above inclusion criteria was included in the study and informed written consent was taken. The examination was performed by using GE MR 355 1.5 Tesla with dedicated knee coil as both transmitters and receiver of radio frequency waves. Images are obtained with patient in a supine feet position. During examination of patients the following sequence are obtained.

1) Axial section: T2W, PD FAT SAT

2) Coronal section: T1W, PD, STIR

3) Sagittal section: GRE, PD, PD FAT SAT

4) ACL AND PCL: T2W THIN

The Imaging system is enclosed in a Radio frequency room.

OBSERVATIONS AND RESULTS

Interpretation of data: the study was evaluated for

1. Age and sex distribution

2. ACL (Anterior cruciate ligament) tear – Partial/complete

3. PCL (Posterior cruciate ligament) tear - Partial/complete

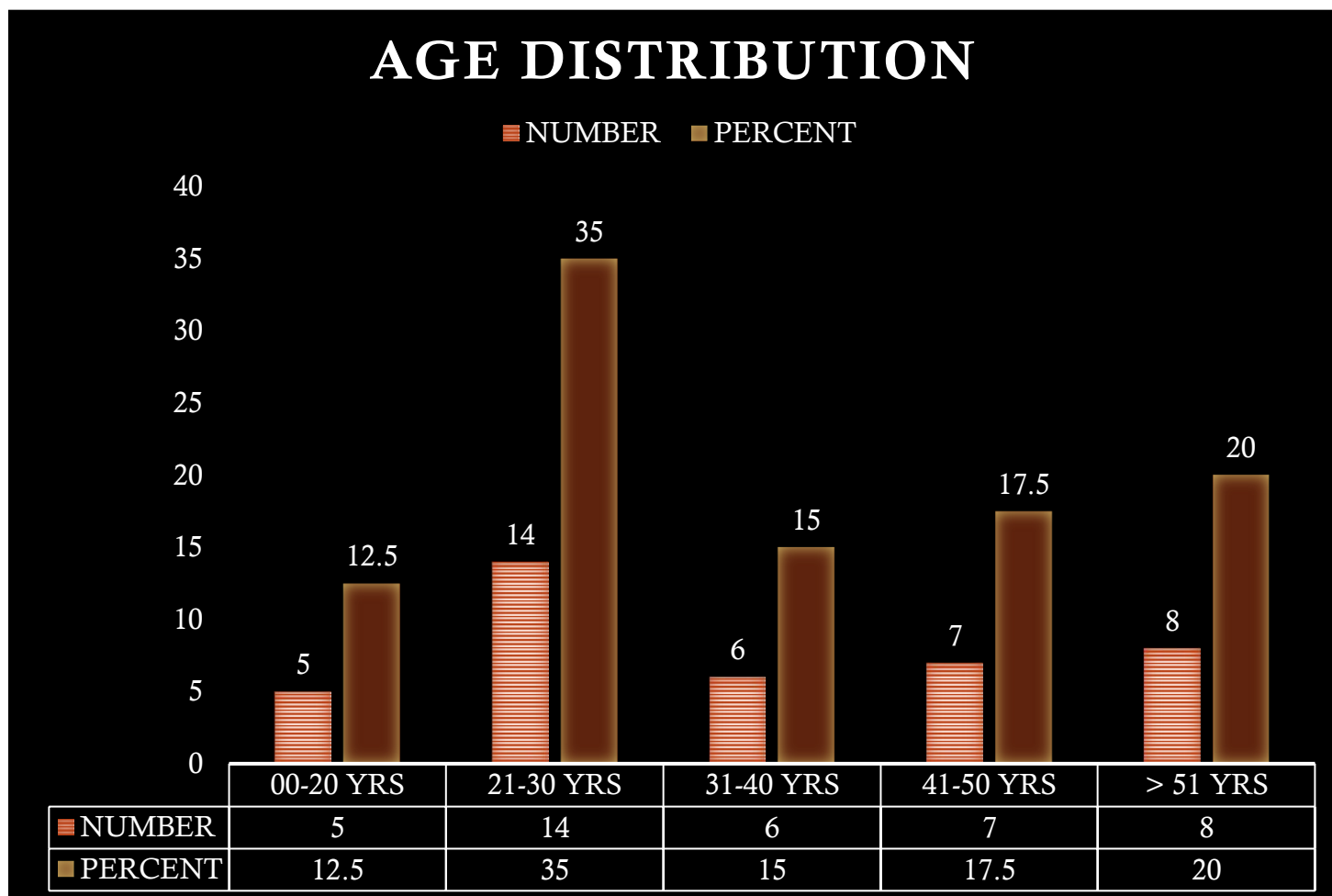
4. MM (Medial Meniscal) tear – Present/Absent Grade – 1/2/3

5. LM (Lateral Meniscal) tear - Present/Absent Grade – 1/2/3

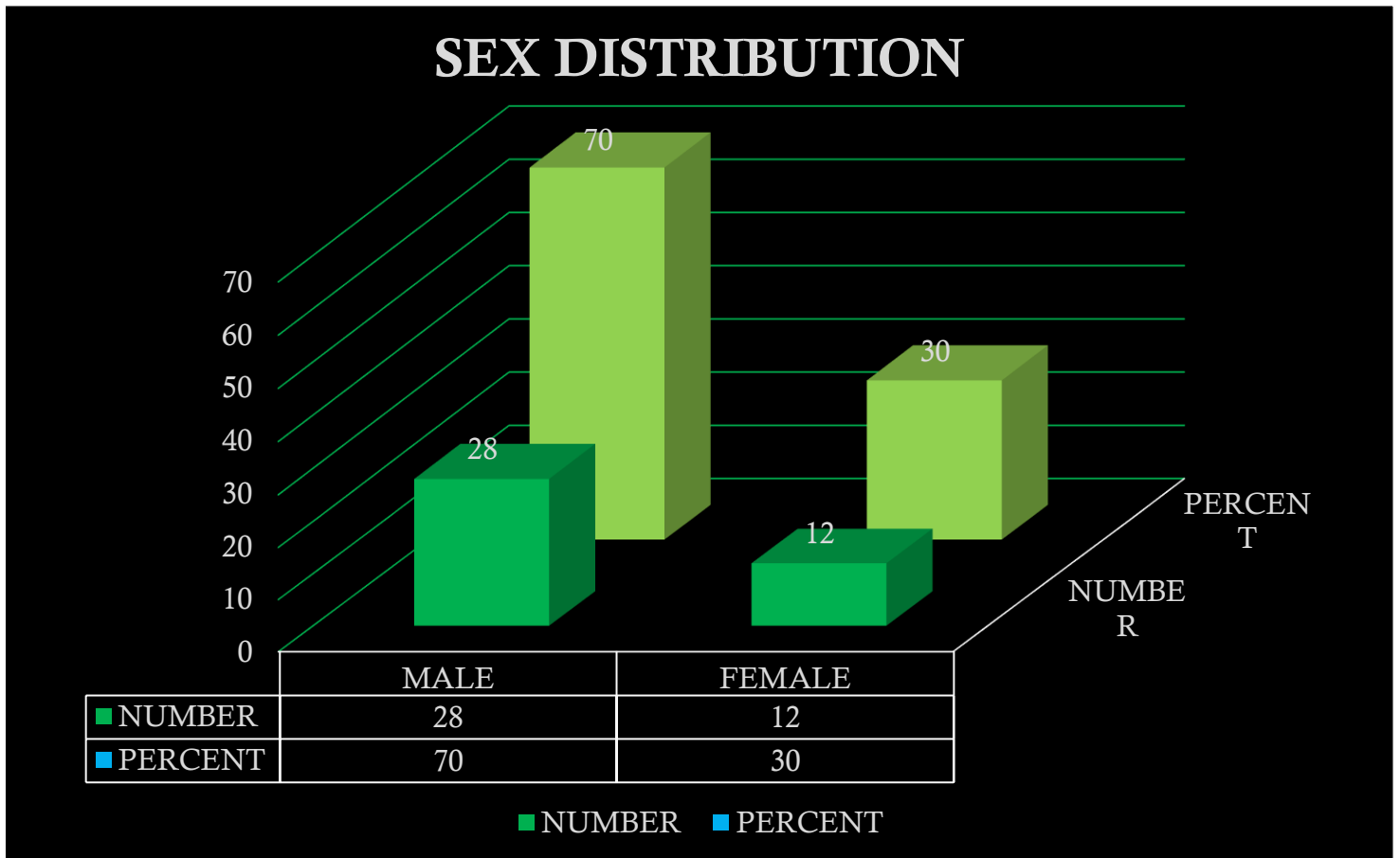
6. MCL (Medial Collateral ligament) tear - Present/Absent Grade – 1/2/3

7. LCL (Lateral Collateral ligament) tear - Present/Absent Grade – 1/2/3

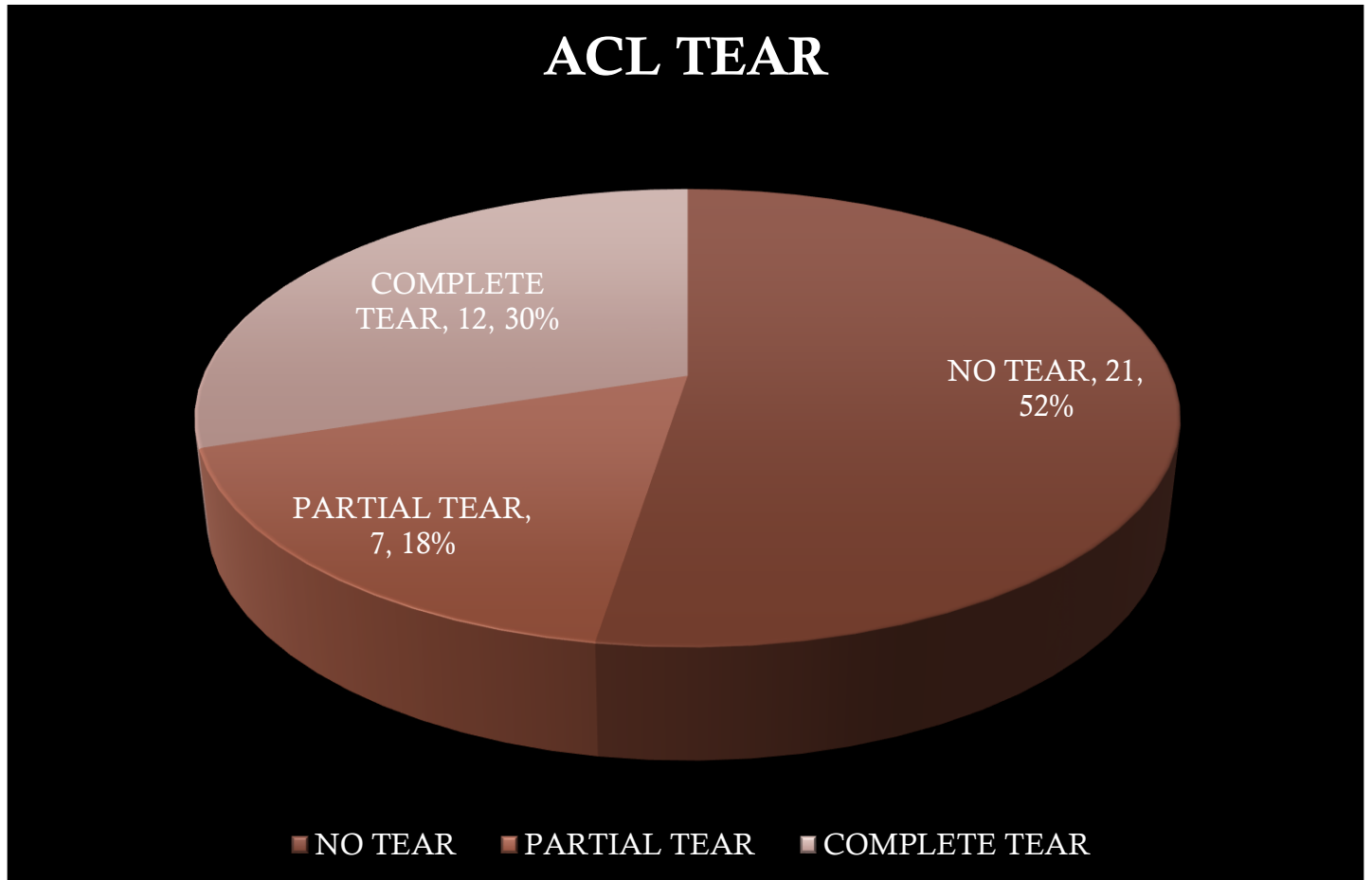
DISTRIBUTION OF AGE GROUPS



DISTRIBUTION OF SEX

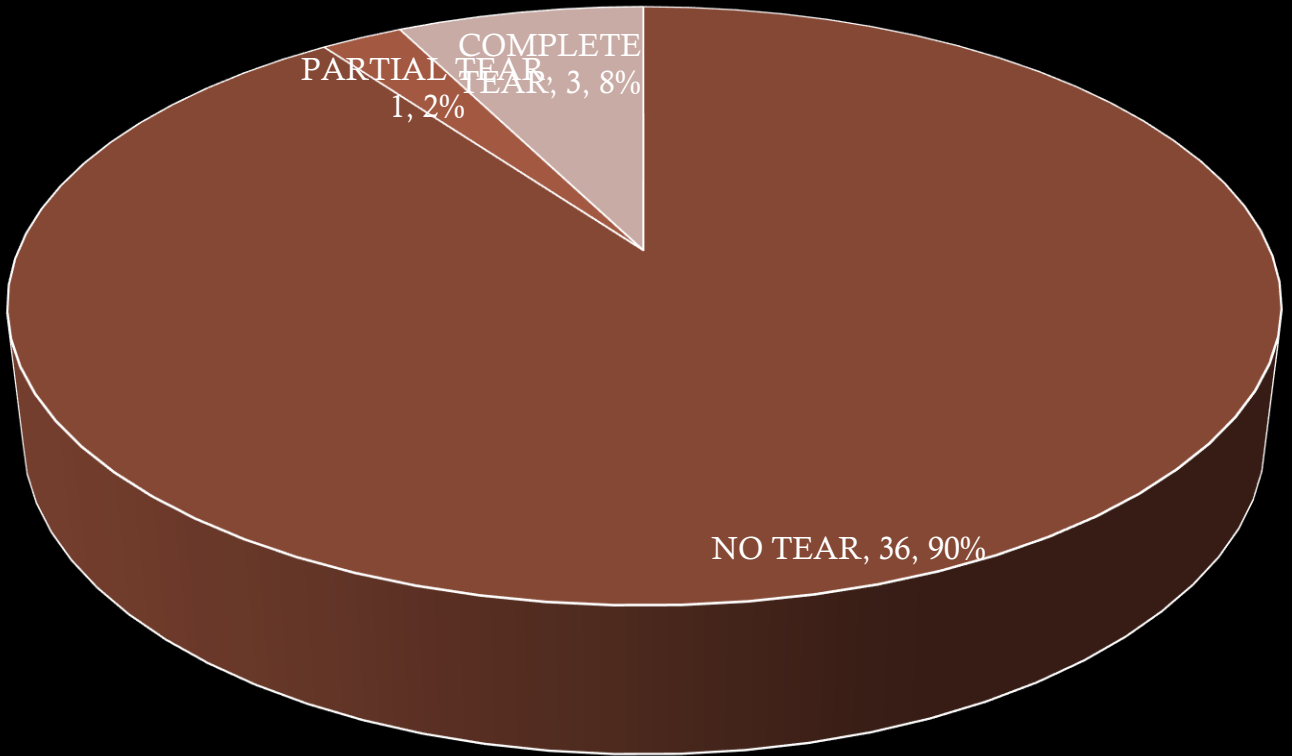


TYPES OF ACL TEAR



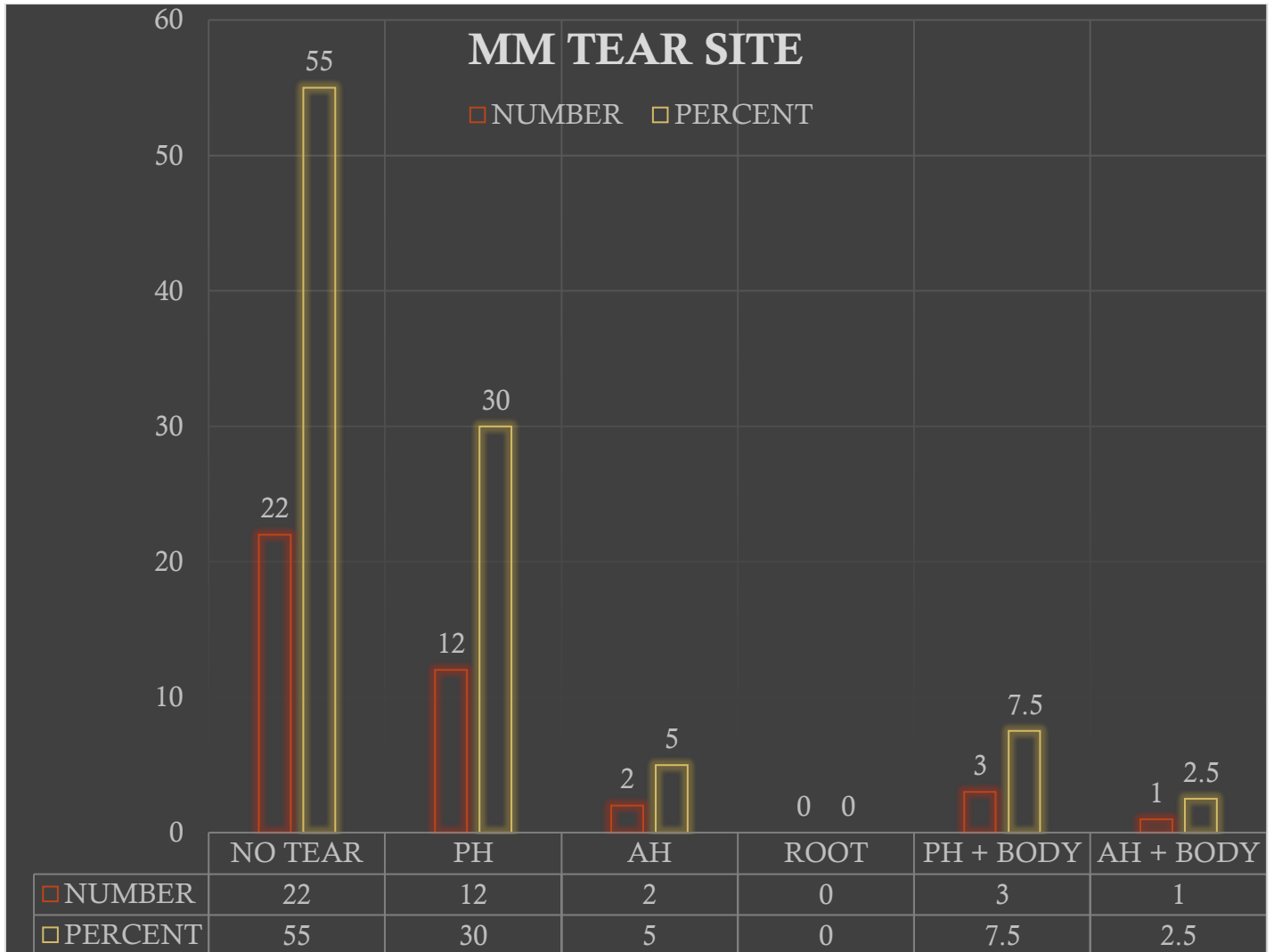
TYPES OF PCL TEAR

PCL TEAR

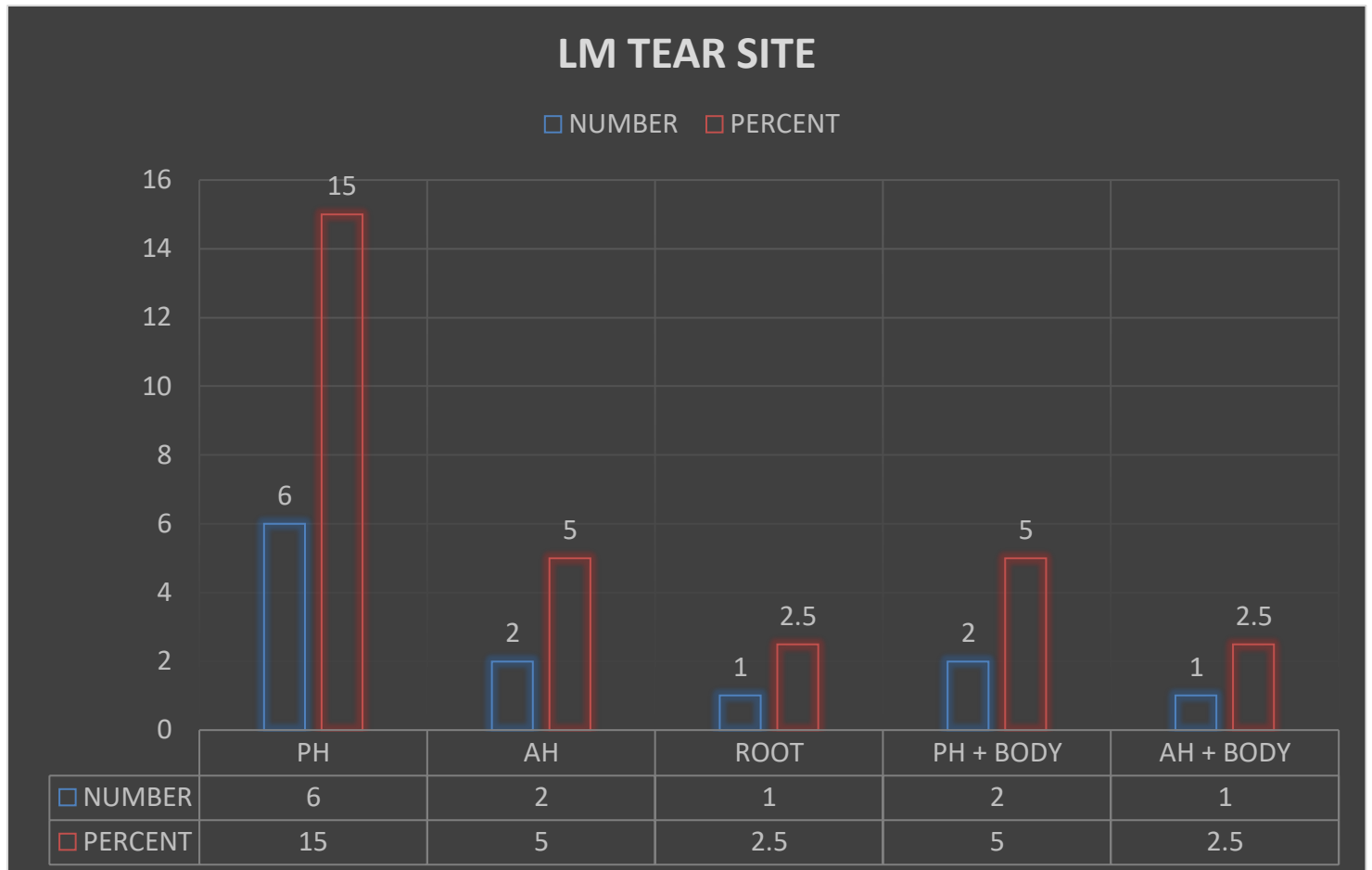


■ NO TEAR ■ PARTIAL TEAR ■ COMPLETE TEAR

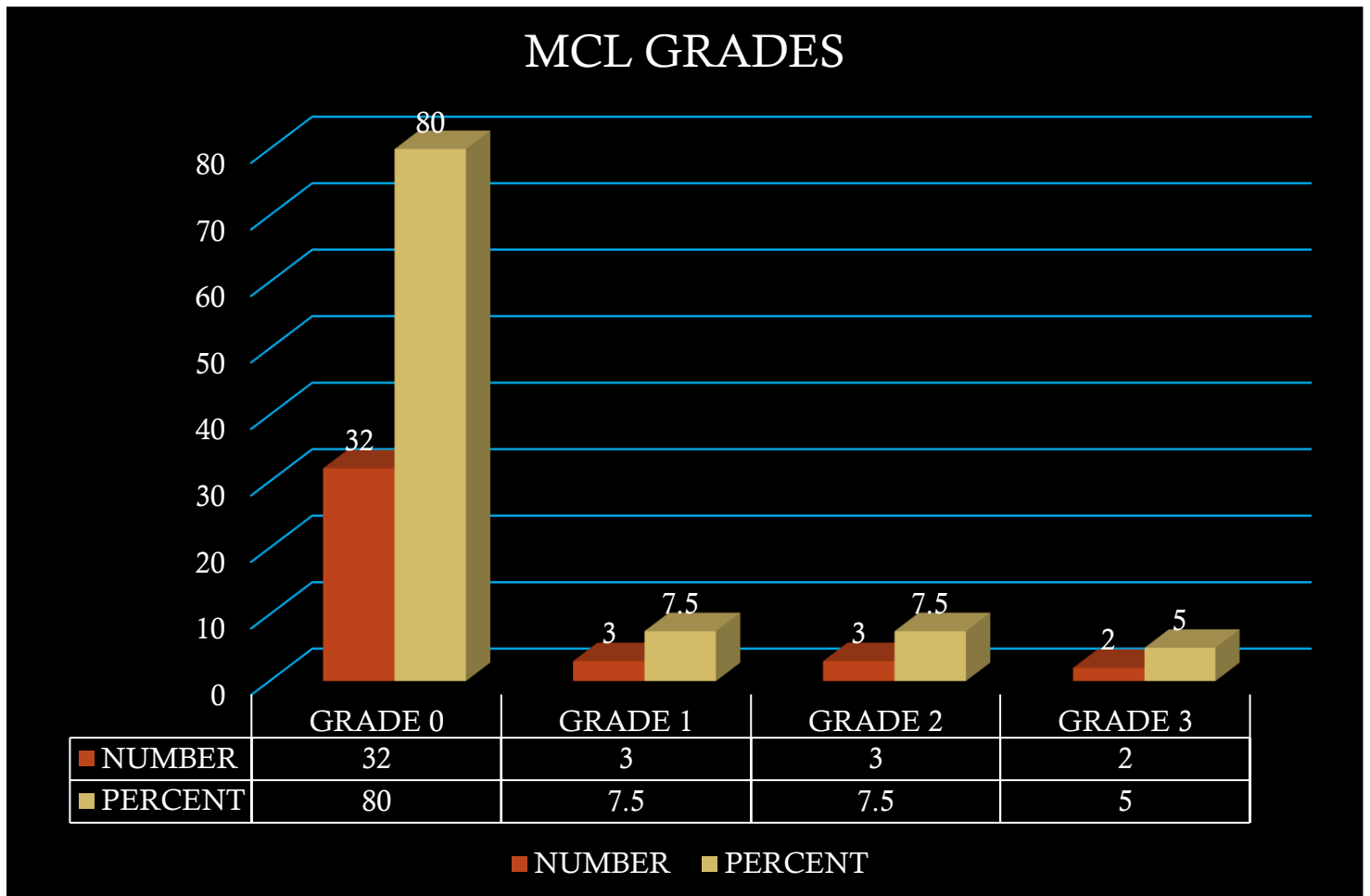
SITE OF MEDIAL MENISCUS TEAR



SITE OF LATERAL MENISCUS TEAR

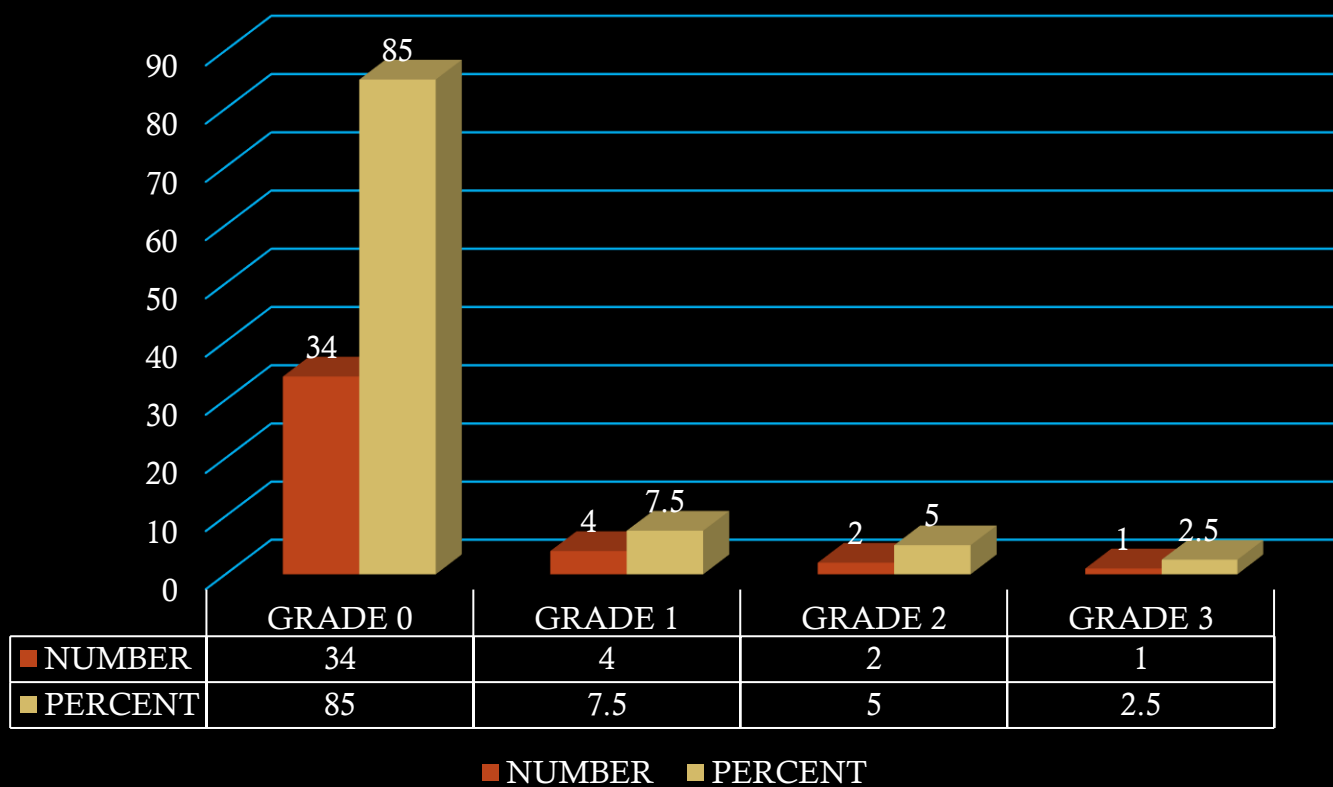


GRADES OF MEDIAL COLLATERAL LIGAMENTS

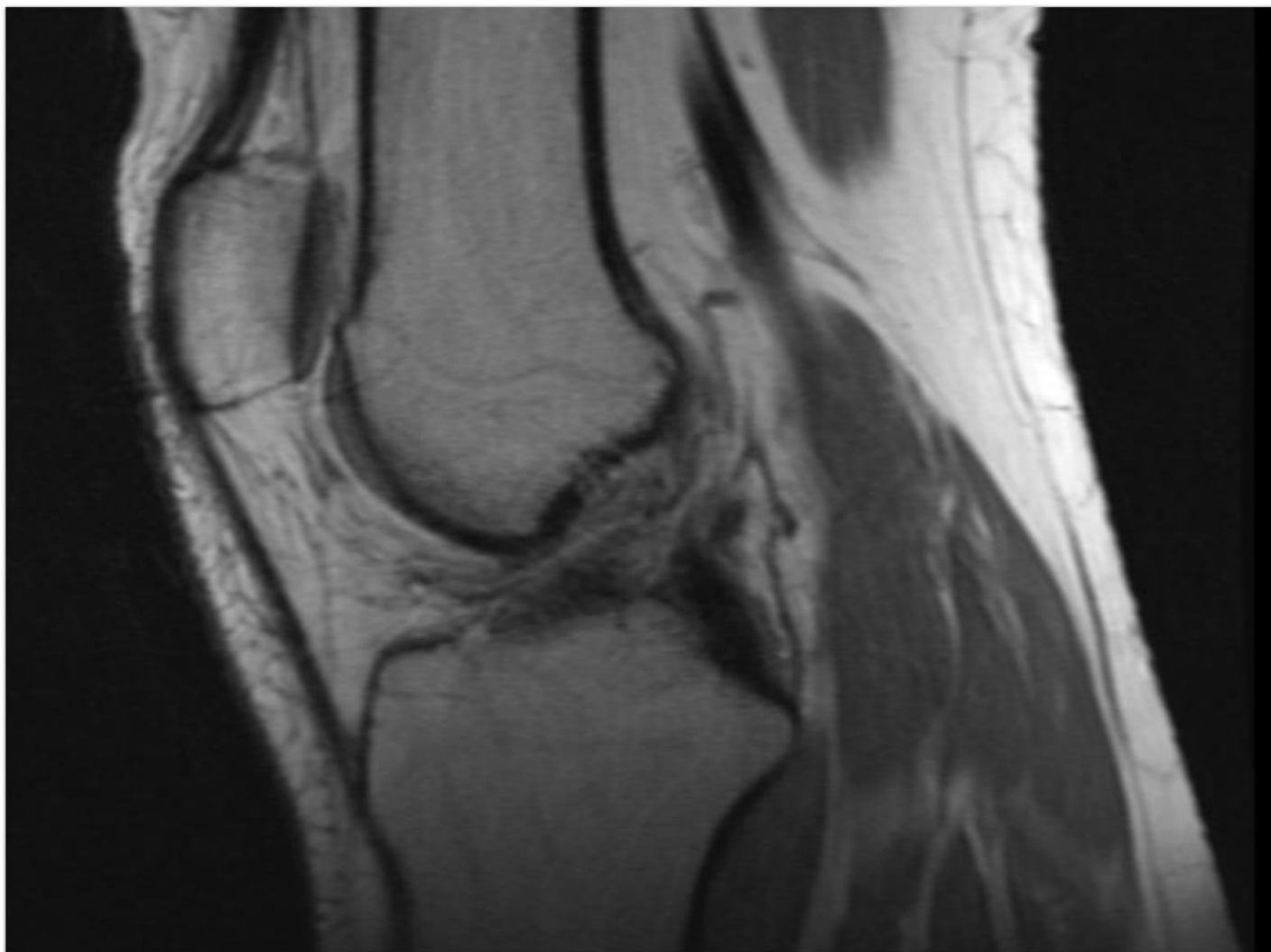


GRADES OF LATERAL COLLATERAL LIGAMENTS

LCL GRADES

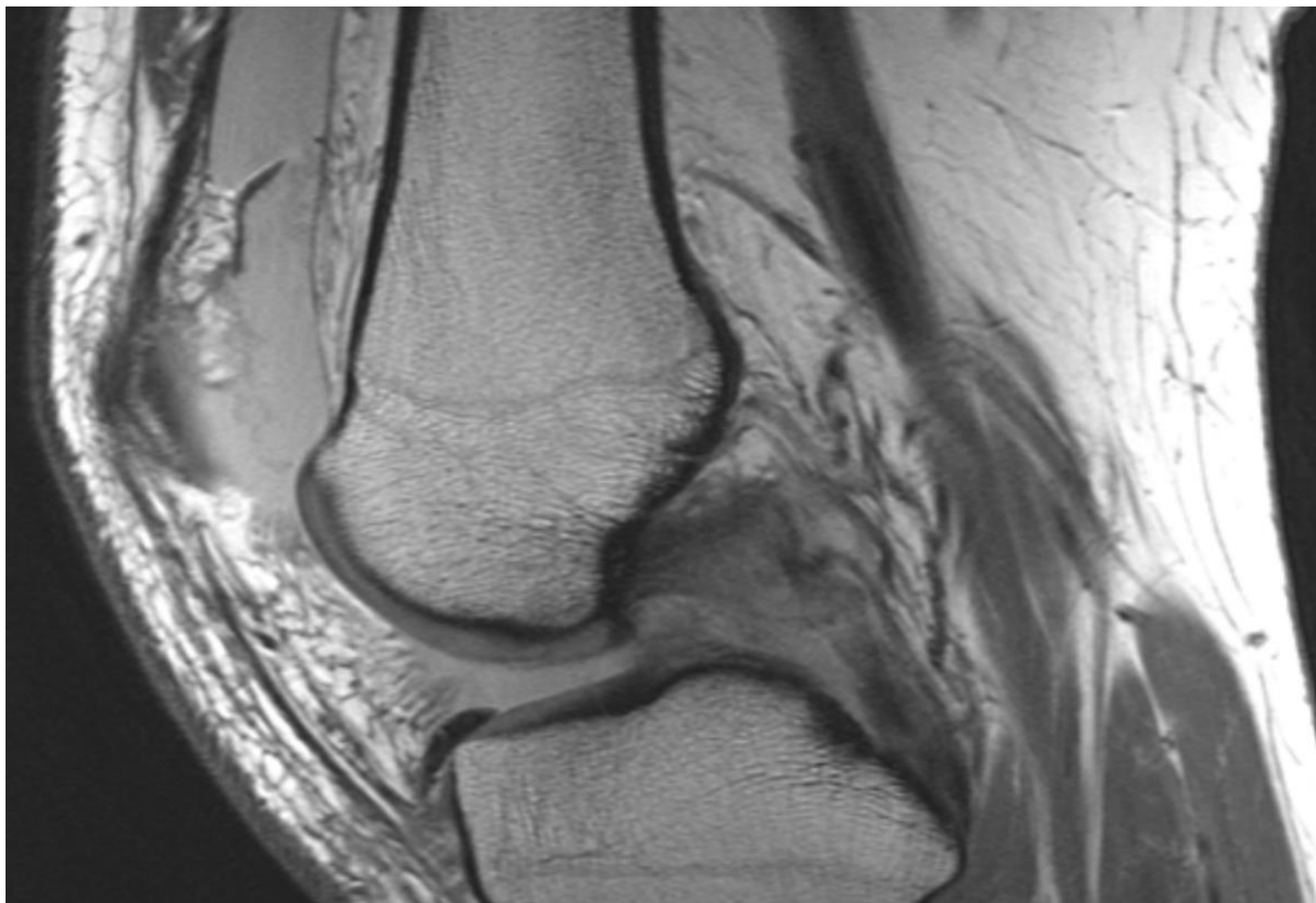


ACL TEAR



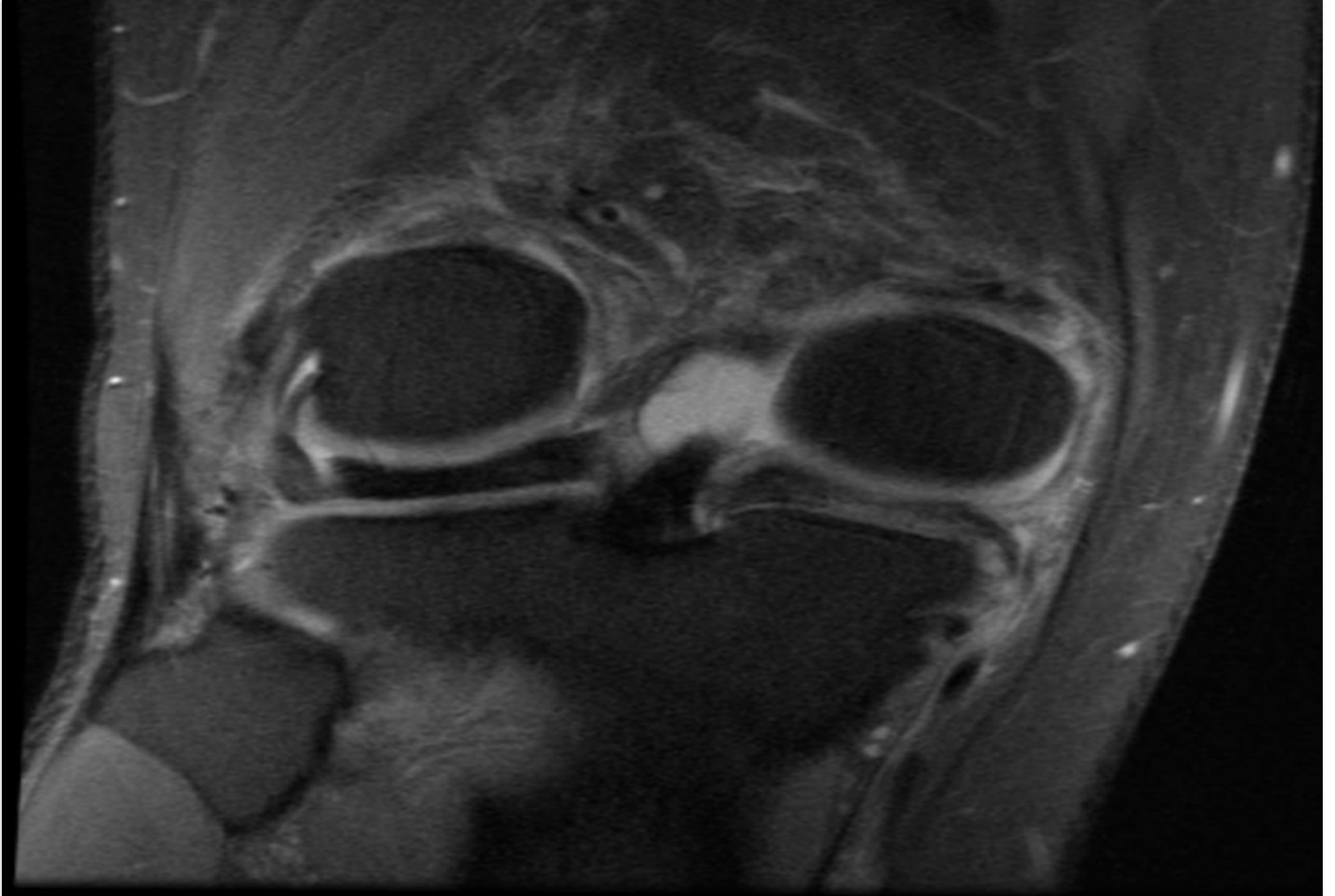
SAG PD

PCL TEAR



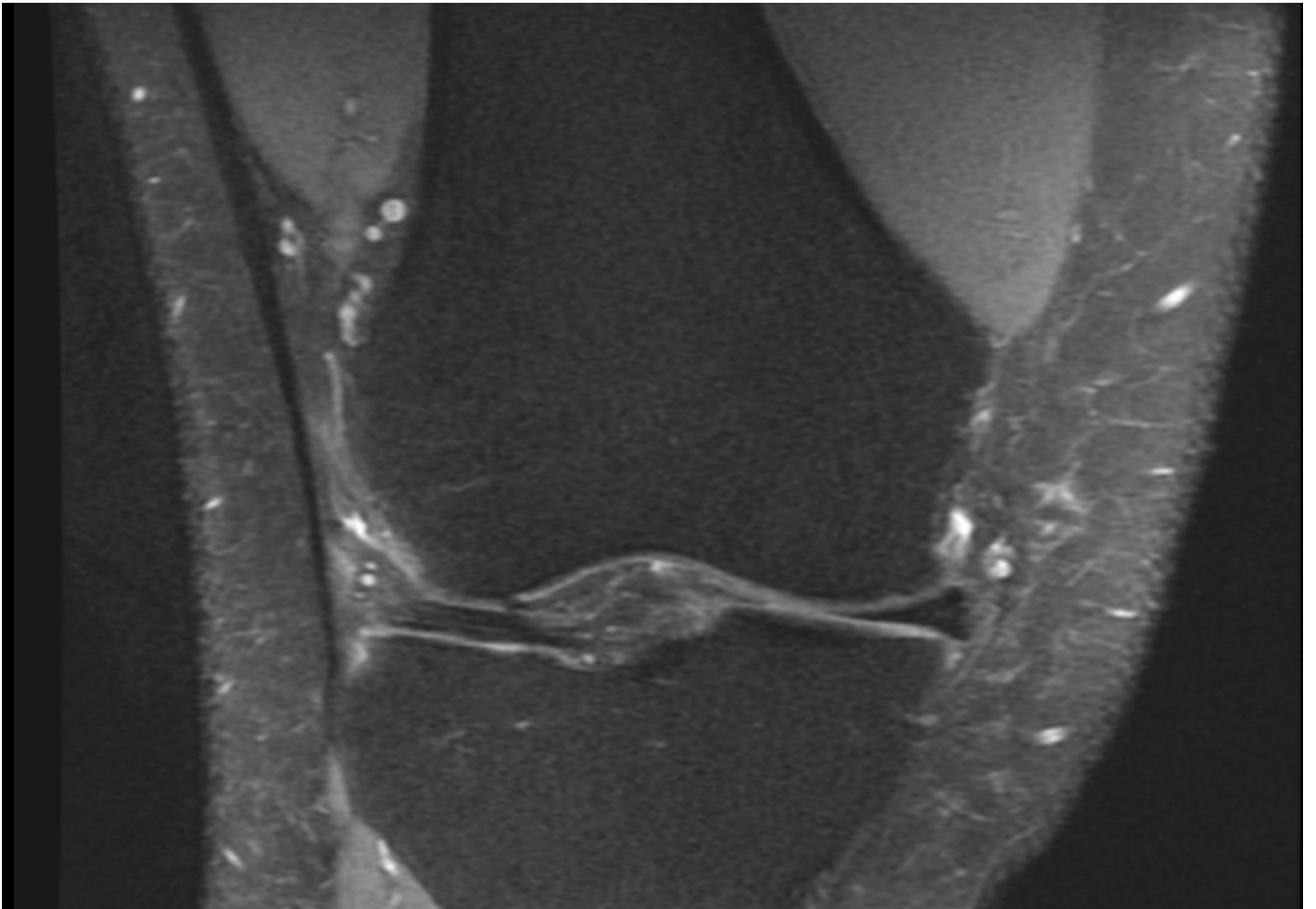
SAG PD

MM TEAR



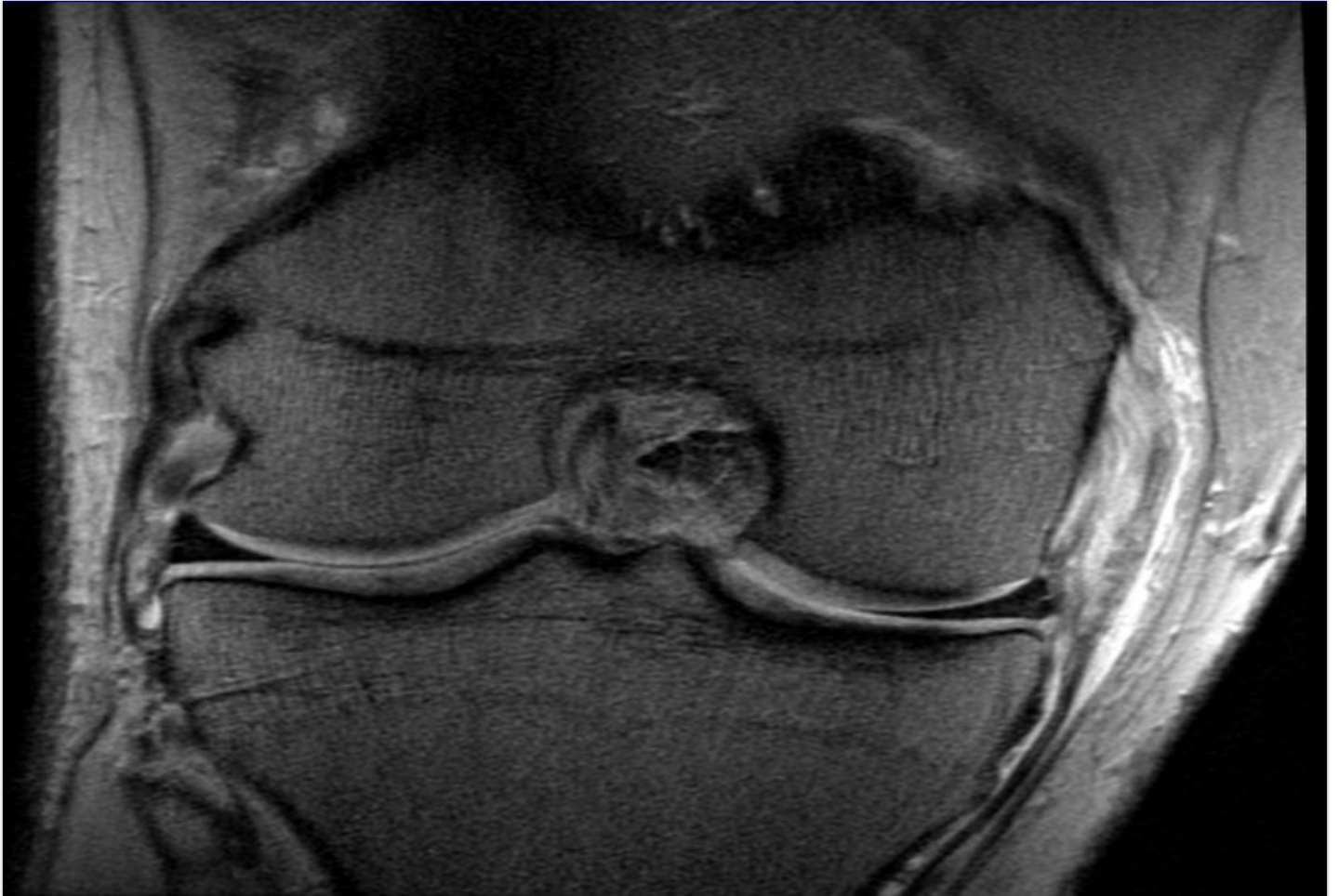
COR STIR

LM TEAR



COR STIR

MCL TEAR



COR STIR

DISCUSSION

In our study, we examined 40 knee joint MRI images, with all patients being imaged for unilateral knee joint with evidence of injuries to menisci, cruciate ligaments, collateral ligaments, articular cartilage.

In our study out of 40 patients, 28 (70%) were males and 12 (30%) were females.

Susceptibility to suffer knee injuries was predominantly seen in younger age group ranging from 21 to 30 years.

A Study done by Venkateshwaran Arumugam et al showed males are most likely to suffer knee injuries since they are active in sports which was similar to our study ⁽⁴⁾.

Cruciate ligament injuries:

ACL injury is the most common, accounting for 19 cases (47.5%) in our study.

Among these 07 cases (17.5%) were partial tears and 12 cases (30%) were complete tears. PCL injuries are less common than ACL injuries and reported rates vary from 3% to 20%.

PCL tear was noted in only 04 patients accounting for 10%. Among these 01 case (2.5%) were partial tears and 03 cases (7.5%) were complete tears.

Study done by Sharma D et al. showed that ACL tear 50% and PCL tear 19% which was similar to our study ⁽⁵⁾.

Collateral ligament lesion:

In our study, MCL tears 08 (20%) were found to be more common than the LCL tear 07 (17.5%). All these cases had a history of trauma and were associated with multiple injuries.

This suggests the presence of a single injury should prompt the examiner to look for other subtle associated injuries, which was similar to the study done by D. Guenoun et al. ⁽⁶⁾

In our study grade 1 injury (17.5%) was more common.

Meniscal tear

Found in 29 cases, 45 % of cases involved only the medial meniscus, 27.5 % of cases involved the lateral meniscus.

SUMMARY

The most common age group involved was between 21 to 30 years. The following patterns of knee injuries were seen:

The most common injury was ACL tear of which complete tears were common. PCL tears were less common.

Among the meniscal injuries, medial meniscal tears were more common than the lateral meniscus. Posterior horn tear was more common in both menisci.

Medial collateral ligament tears outnumbered lateral collateral ligament tears and grade 1 tears were more common in MCL.

CONCLUSION

Knee joint injuries are common.

The need to accurately evaluate the knee injuries is very crucial for the proper management and outcome, otherwise, it will lead to chronic debility to the patient.

MRI is an excellent, non-invasive, radiation-free imaging modality with multiplanar capabilities and excellent soft-tissue delineation.

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