



## LATERAL CONDYLAR RIDGE OF FEMUR

## Anatomy

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## ABSTRACT

Anterior cruciate ligament (ACL) tear is a common injury in orthopaedic sports medicine. The only osseous landmark described in the ACL femoral attachment is the so called lateral condylar ridge - resident's ridge. Osseous anatomy of femoral condylar notch was studied. The presence of an osseous ridge on the lateral wall of intercondylar notch and slightly anterior to posterior outlet was checked in all the bones. Results showed the presence of ridge in 98.21% of males and 95.45% of females. In the studied population, only in 3 femurs the ridge was unable to be defined. The present study results are correlating most of the previous studies. The study results did not reveal any marked sex difference. The osseous anatomy of femoral intercondylar notch is crucial for accurate reconstruction of injured ACL. The presence of lateral intercondylar ridge helps in the accurate femoral tunnel placement during reconstruction surgery.

## KEYWORDS

anterior cruciate ligament, lateral intercondylar ridge, femoral condyle.

## INTRODUCTION :

Anterior cruciate ligament (ACL) tear is a common injury in orthopaedic sports medicine. Accurate and anatomic tunnel placements are essential to the success of reconstruction of the anterior cruciate ligament (ACL). Femoral guides have been designed to reduce the risk of anterior tunnel placement. The long axis of the lateral condyle is slightly longer and is placed in a more sagittal plane than the long axis of the medial condyle. The only osseous landmark described in the ACL femoral attachment is the so called lateral condylar ridge - resident's ridge. The lateral condylar ridge is located on the medial wall of the lateral femoral condyle and runs from anterior to posterior with the knee in 90 degrees of flexion.

The present study is aimed to see the presence of this bony landmark in 100 adult femurs in South Indian population.

## MATERIALS AND METHODS :

This observational study was conducted in the department of Anatomy, SRMC, Chennai. 100 adult femurs were selected for the study. Bones with morphological abnormalities and degenerative changes were not included in this study. Selected bones were grouped into males and females based on the given criteria in table I. [1]

Table - I

VARIABLE	MALE	FEMALE
Head	Articular surface is greater than two third of a sphere.	Articular surface is less than two third of a sphere
Neck - shaft angle	Obtuse about 125 degree	Almost right angle
Bicondylar width	74 - 89 mm	67 - 76 mm
Vertical diameter of head	Greater than 48 mm	less than 44 mm
Popliteal length	135 - 145 mm	106 - 114 mm

## RESULTS :

Osseous anatomy of femoral condylar notch was studied. The presence of an osseous ridge on the lateral wall of intercondylar notch and slightly anterior to posterior outlet was checked in all the bones. This bony ridge is termed as lateral intercondylar ridge. The lateral intercondylar ridge was depicted in figure 1.

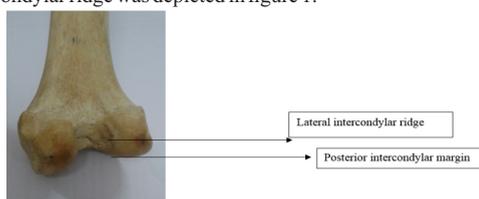
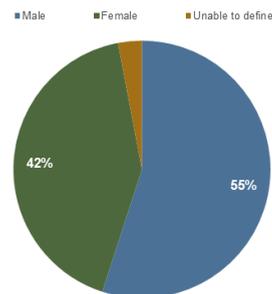


Fig. 1 showing the lateral condylar ridge

The lateral condylar ridge was observed in 55 out of 56 male specimens and 42 out of 44 female specimens. Results showed the presence of ridge in 98.21% of males and 95.45% of females. In the studied population, only in 3 femurs the ridge was unable to be defined. This accounts to be 3% of studied bones. Results did not reveal any marked sex difference. The observations are shown in pie chart I.

Pie chart I showing the observation of the study



## DISCUSSION :

Morphologically, the femoral condyles are asymmetrical. The lateral condyle is slightly shorter than the medial. The larger medial condyle has a more symmetrical curvature. The intercondylar notch separates the two massive condyles distally and posteriorly. There is a crest at the junction of the popliteal surface of femur with the posterior outlet of the intercondylar notch. This crest is the medial border of the "over-the-top-position" of the lateral femoral condyle. This crest is termed as posterolateral rim of the intercondylar notch.

An osseous ridge on the lateral wall of the intercondylar notch slightly anterior to the posterior outlet is termed as the resident's ridge. [2]. This ridge was called as lateral intercondylar ridge based on anatomical location [3].

Arthroscopically, a linear ridge running from superior-anterior to inferior-posterior on the lateral notch wall was consistently observed 7 to 10 mm anterior to posterior articulating cartilage margin of the lateral femoral condyle. The morphology of the lateral intercondylar ridge is variable. It may be smooth or defined. It is suggested that the morphological variation is because of the osseous remodelling in response to stress from the ligament fibres [4]. This may be the reason why the ridge is more prominent in young active people as they put more strain on their ACL [5].

Hutchinson and Ash, described the lateral intercondylar ridge (resident's ridge) in 90% of specimens in their study [2]. Farrow et al in 2007, noted the presence of lateral intercondylar ridge in 97% of specimens [6]. Their study included 200 femurs in which the ridge was

present in 100% of males, while it was evident only in 94% of females. According to these results, they reported the significant difference between males and females. In 2010, Van Eck et al found lateral intercondylar ridge in 88%. [7]. In an arthroscopic study conducted by Shino et al in 2010, revealed the resident's ridge in 100% of patients [8]. The present study results are correlating with most of the previous studies. The study results did not reveal any marked sex difference.

The lateral intercondylar ridge may serve as a checkpoint to confirm correct femoral tunnel placement during the anterior cruciate ligament reconstruction. During anterior cruciate ligament reconstruction, the lateral intercondylar ridge is commonly removed as it may obscure visualisation of the posterolateral rim of the intercondylar notch. Farrow et al., (2007) proposed that the location of the lateral intercondylar ridge should be noted prior to its removal because a properly placed femoral tunnel should be slightly posterior to it [6]. Since the lateral intercondylar ridge is present in majority of femurs, if the ridge is not visualised during surgery, the surgeon should suspect that what may appear to be the back of the intercondylar notch is actually the lateral intercondylar ridge.

#### CONCLUSION :

Anterior cruciate ligament reconstruction is the very common procedure in orthopaedics. The osseous anatomy of femoral intercondylar notch is crucial for accurate reconstruction of injured ACL. The presence of lateral intercondylar ridge helps in the accurate femoral tunnel placement during reconstruction surgery. The present observation study revealed the presence of a well defined lateral intercondylar ridge in 97% of study specimens.

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