

# Prominent Resident's Ridge as a Potential Cause of Anterior Cruciate Ligament Impingement: A Case Report

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## Learning Point of the Article:

Prominent resident's ridge must be identified and excised, to allow for isometric placement of ACL graft and to protect the reconstructed ACL from subsequent impingement.

## Abstract

**Background:** The resident's ridge is an arthroscopic landmark that is consistent with the anterior border of the anterior cruciate ligament (ACL) femoral attachment. The identification of the landmark allows for accurate graft placement.

**Case Report:** We report a case of a 30-year athletic individual with an ACL-deficient knee, who had an abnormally large resident's ridge, abutting the midsubstance of the torn ACL; the residual femoral attachment was behind the ridge. Resection and burring of this ridge were needed to expose the posterior aspect of the intercondylar notch; even after bone-patellar tendon-bone graft placement, some additional removal of bone had to be done to reduce graft impingement on this area in extension.

**Conclusion:** Abnormal resident's ridge may be misleading about the anatomy of the lateral femoral condyle area. Appropriate resection of abnormal bone is the key to the identification of femoral footprint and graft placement. We speculate that this bony projection may even have contributed to the ACL injury, and extra bone had to be removed to minimize subsequent impingement.

**Keywords:** Anterior cruciate ligament reconstruction, resident's ridge, knee arthroscopy, anterior cruciate ligament impingement, bone-patellar tendon-bone graft.

## Introduction

The "resident's ridge" or "lateral intercondylar ridge" is the bony ridge on the medial surface of the lateral femoral condyle. During transtibial arthroscopic anterior cruciate ligament (ACL) reconstruction, it has the potential to be mistaken as the posterior articular margin of the condyle by inexperienced surgeons, which could lead to graft malposition [1]. However, with an increasing understanding of the anatomy, surgeons are now using this landmark to identify the anterior margin of ACL femoral footprint, as this is a consistent anatomical structure, which can guide the graft placement in chronic ACL injuries [2]. Nevertheless, anatomic variations could create problems; as this landmark is taken to be a constant, a prominent resident's ridge which resembles the posterior margin could be confusing and needs appropriate recognition and excision before ACL

reconstruction.

## Case Report

We report a case of a young 30-year male, who suffered a non-contact twisting/extension injury to the left knee while playing football in 2018; he was diagnosed with ACL "sprain" and lateral meniscal tear on magnetic resonance imaging (MRI). The chief complaint of the patient at that time was pain and discomfort, which recovered uneventfully over a period of 6 weeks. The patient was asymptomatic for 1.5 years. He is a pilot by profession and during his subsequent training, he complained of another giving way episode during running and pivoting around obstacles; the knee remained swollen for 2 weeks. On examination, a positive Lachman and Pivot shift test confirmed the diagnosis of an ACL deficient knee; this was confirmed on

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## Author's Photo Gallery



Dr. Mandeep Singh Dhillon



Dr. Aman Hooda

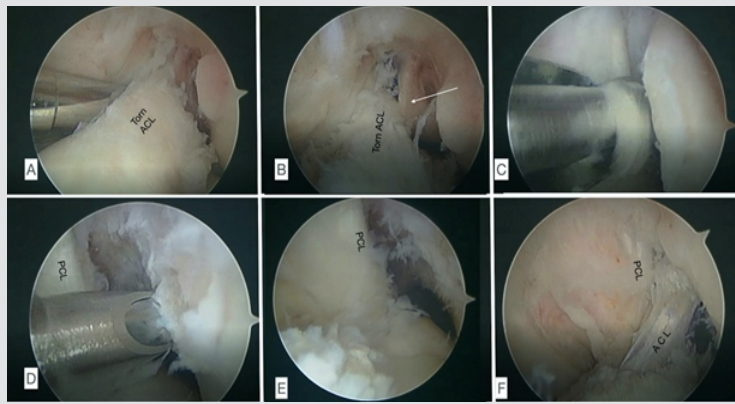


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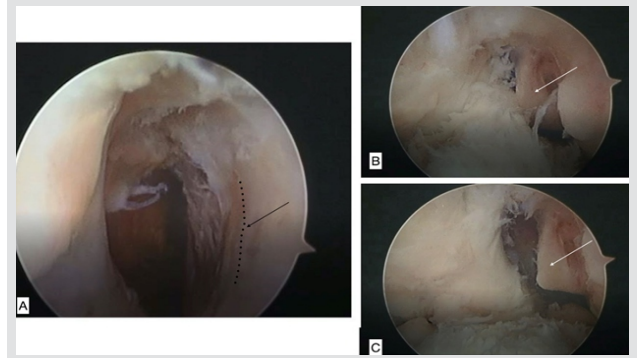
**Figure 1:** (A) Arthroscopic view of the intercondylar region with torn anterior cruciate ligament (ACL); (B) hypertrophied resident ridge (white arrow); (C) burring of the hypertrophied ridge; (D) shaver to clear the surroundings of ACL footprint; (E) normal posterior cruciate ligament and ACL footprint on femoral aspect after clearing the hypertrophied ridge; (F) ACL reconstruction with bone-patellar tendon-bone graft in position after fixing with two biointerference screws.

repeat MRI. During arthroscopic ACL reconstruction, an elevated bony crescentic projection was noted on the inner surface of the lateral femoral condyle. This was anterior to the mid-substance of the ACL fibers (Fig. 1A and B) and the remaining ACL stump seemed to go posterior to it. On probing, the ridge was noted to be similar to a “bony osteophyte” and was an extension of the resident’s ridge. This ridge was burred out to its base, and subsequently, the posterior margin of the lateral condyle was well visualized (Fig. 1C-F). ACL reconstruction using standard transtibial portals and bone-patellar bone graft was carried out. After graft placement, the ridge needed some more burring to minimize impingement. Standard protocols were used and the patient is asymptomatic at 3 months follow-up.

**Discussion**

The resident’s ridge is a crescent-shaped consistent bony landmark that marks the anterior border of the ACL femoral attachment [1-3] and the posterior border of the ACL footprint is marked by the posterior articular margin of the lateral femoral condyle [1]. Multiple authors have confirmed the resident’s ridge to be a consistent arthroscopic landmark for identifying the anterior edge of the femoral footprint of ACL, which is often mistaken for the posterior condylar edge in torn ACLs with deficient residual footprints [2-6]. The resident’s ridge has been so labeled as it could mislead an inexperienced arthroscopic surgeon into mistaking this as the posterior articular surface and err in graft positioning which may lead to subsequent graft failure [7].

It is, therefore, vital to identify the ridge during ACL reconstruction to replicate the isometric positioning of the ACL graft. Such isometry leads to achieving optimum functional results after an ACL reconstruction. Causes for ACL impingement should be looked for during arthroscopy to give



**Figure 2:** (A) Arthroscopic view of the left knee intercondylar region with the dotted line and a black arrow showing the residents ridge in a knee with normal anatomy (after removal of torn anterior cruciate ligament [ACL]) for comparison with the anomaly in the current case; (B) hypertrophied residents ridge/anatomic variant of resident’s ridge (white arrow) along with the torn ACL; (C) hypertrophied resident ridge (white arrow) post removal of redundant ACL fibers, before ACL reconstruction with bone-patellar tendon-bone graft.

the patient an optimum and functional prognosis.

The bony outgrowth in the present case, which we have labeled as a “Prominent resident ridge,” is a unique projection of bone with potentially significant impingement on the ACL; such a significant prominence has not been previously reported in the literature (Fig. 2B and C). An arthroscopic view of the left knee intercondylar region of a patient with similar age showing the residents ridge in a knee with normal anatomy (after removal of torn ACL) for comparison with the anomaly in the current case (Fig. 2A). This hypertrophied ridge reduces the intercondylar notch volume, with the potential to cause impingement on the ACL (contact between the lateral wall of the intercondylar notch and the ACL), which may increase the potential for ACL injury [8-10]. Recognition and removal of this bony projection are important. It seems that this projection is congenital due to its smooth surface and continuation with an underlying bone; it can be speculated that this could be hypertrophy after an avulsion injury with bony overgrowth, but since the ACL was torn in its mid-substance, with an intact residual femoral footprint seen behind this ridge, that seems improbable.

**Conclusion**

This first of its kind reported prominent residents ridge reduces the volume of the intercondylar notch and maybe a cause “ACL Impingement” even in well-placed grafts. It must be recognized and appropriately excised, to visualize the femoral footprint, to allow for proper graft placement, as well as to protect the reconstructed ACL from impingement.

**Clinical Message**

A hypertrophied resident’s ridge, in the absence of an ACL stump in chronic injuries, may mislead one to think this is the posterior edge of the intercondylar notch. Even if recognition is adequate, a prominent ridge could impinge on reconstructed grafts and cause late graft attrition.



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## How to Cite this Article

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