

# Femoral notch cleaning in anterior cruciate ligament reconstruction: a new instrument

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## ABSTRACT

**This article describes using of this new, improvised instrument that enables better removal of ACL remnants, increased visibility of the intercondylar notch, precise location of the femoral tunnel and by doing this shortens the operative time. Also, the use of this instrument is cost beneficial, because it decreases the number of disposable shaver tips used and can decrease the cost of the procedure which is important for countries with poor economies.**

**Keywords:** Anterior Cruciate Reconstruction; Femoral Notch Cleaning; Improvised Instrument

## 1. INTRODUCTION

Optimal anatomical replacement of anterior cruciate ligament (ACL) is essential for achieving knee stability. The most frequent surgical error causing ACL reconstruction failure is anterior and more vertical femoral tunnel placement [1,2]. One potential reason for this is failure to accurately identify the true over-the-back position on the femur in the posterior aspect of the notch. Debridement of soft tissue in the notch using radiofrequency energy, shaver or different type of rasps is necessary in ACL reconstruction of the knee. In order to simplify and speed up the removal of the ACL remnants at the femoral insertion, a new, improvised instrument for ligament remnants removal has been developed.

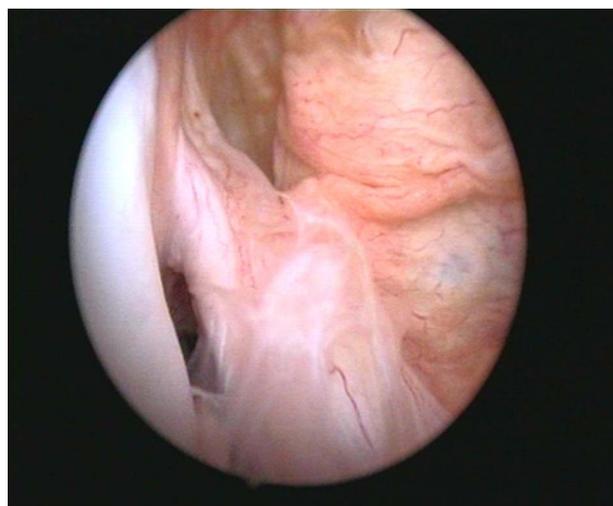
## 2. TECHNICAL NOTE

An all-inside arthroscopic procedure for ACL reconstruction was used. After the autograft had been harvested, arthroscopic examination of the knee was performed. The ACL remnants in close contact with the PCL were removed using a shaver (**Figure 1**). Using a medial portal, a special instrument for the removal of the ACL ligament remnants at the femoral insertion, was introduced into the knee. The instrument comprised of a 10 cm long,

headless, cancellous screw with 9-10th-threads at its distal end and a proximal end fitted to a holder (**Figure 2**). The instrument was placed in close contact with the superior and lateral part of the intercondylar roof and by moving it from the anterior to posterior, the ACL remnants were removed from the intercondylar roof and medial part of the lateral femoral condyle. The small rest of the remnants were removed using a shaver (**Figure 3**). Afterwards, the procedure was continued in the usual fashion.

## 3. DISCUSSION

Accurate and anatomic tunnel placements are essential to the success of reconstruction of the anterior cruciate ligament (ACL). On the femoral side, ideal tunnel placement in the sagittal plane is in the posterior quartile [3]. In the coronal plane, the common goal is to place the tunnel between the 1 and 2 o'clock position on the left and between 10 and 11 o'clock position on the right [4].



**Figure 1.** Arthroscopic view of the right knee from the anterolateral portal, ACL remnants.



**Figure 2.** New, improvised instrument for ACL remnants removal. The instrument comprised of a 10 cm long, headless, cancellous screw with 9-10 threads at its distal end and a proximal end fitted to a holder.



**Figure 3.** Arthroscopic view of the right knee from the anterolateral portal after using instrument. ACL remnants were removed from the intercondylar roof and medial part of the lateral femoral condyle. The notch doesn't have ACL remnants.

Tunnel placement based on lateral intercondylar ridge and lateral bifurcate ridge, is a more reliable approach [5-8]. The lateral intercondylar ridge is the superior border of the ACL with the knee in 90° of flexion, and the anterior border of the ACL with the knee in full extension [6,7]. The lateral bifurcate ridge separates the femoral attachment of the AM and PL bundles [6,7]. The visualization of these landmarks requires meticulous rem-

nant removal. Failure to recognize these bone landmarks, leads to nonanatomic placement of the femoral tunnel and, therefore, premature failure of reconstructions. In older patients with poor bone quality, one has to be very careful not to overdo with the ACL remnant removal, since this can result in a significant bone indentation. Up till now, we have used this instrument in over 200 arthroscopic ACL reconstruction procedures without any difficulty or complications.

#### 4. CONCLUSIONS

The use of this new, improvised instrument enables better removal of ACL remnants, increased visibility of the intercondylar notch and precise location of the femoral tunnel and by doing this shortens the operative time. Also, the use of this instrument is cost beneficial, because it decreases the number of disposable shaver tips used and can decrease the cost of the procedure which is important for countries with poor economies.

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