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The Patellar Tendon Can Cause External Tibial Component Malrotation in Lateral Unicondylar Knee Arthroplasty

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Introduction

The optimal rotational axis of the tibial component in lateral unicompartmental knee arthroplasty (UKA) should be aligned parallel to the lateral tibial spine. However, the relatively lateral positions of the tibial tubercle and patellar tendon make the sagittal tibial cut in lateral UKA difficult and commonly predisposes to inadvertent external rotation of the tibial component. The purpose of this study was to quantify the potential rotational impact that occurs when aligning the anterior edge of the sagittal tibial cut with the lateral edge of the patellar tendon in lateral UKA.

Methods

A consecutive cohort of 15 patients undergoing lateral UKA by a single surgeon between June 2011 and May 2012 was examined. All patients underwent preoperative computed tomography (CT) scans with three dimensional reconstruction. The angle between the longitudinal axis of the lateral tibial spine and the axis formed between the posterior aspect of the lateral tibial spine and the lateral edge of the patellar tendon was calculated in each case (Figure 1). This angle determined the impact of a sagittal tibial resection performed at the lateral edge of the patellar tendon on the rotational alignment of the tibial component.

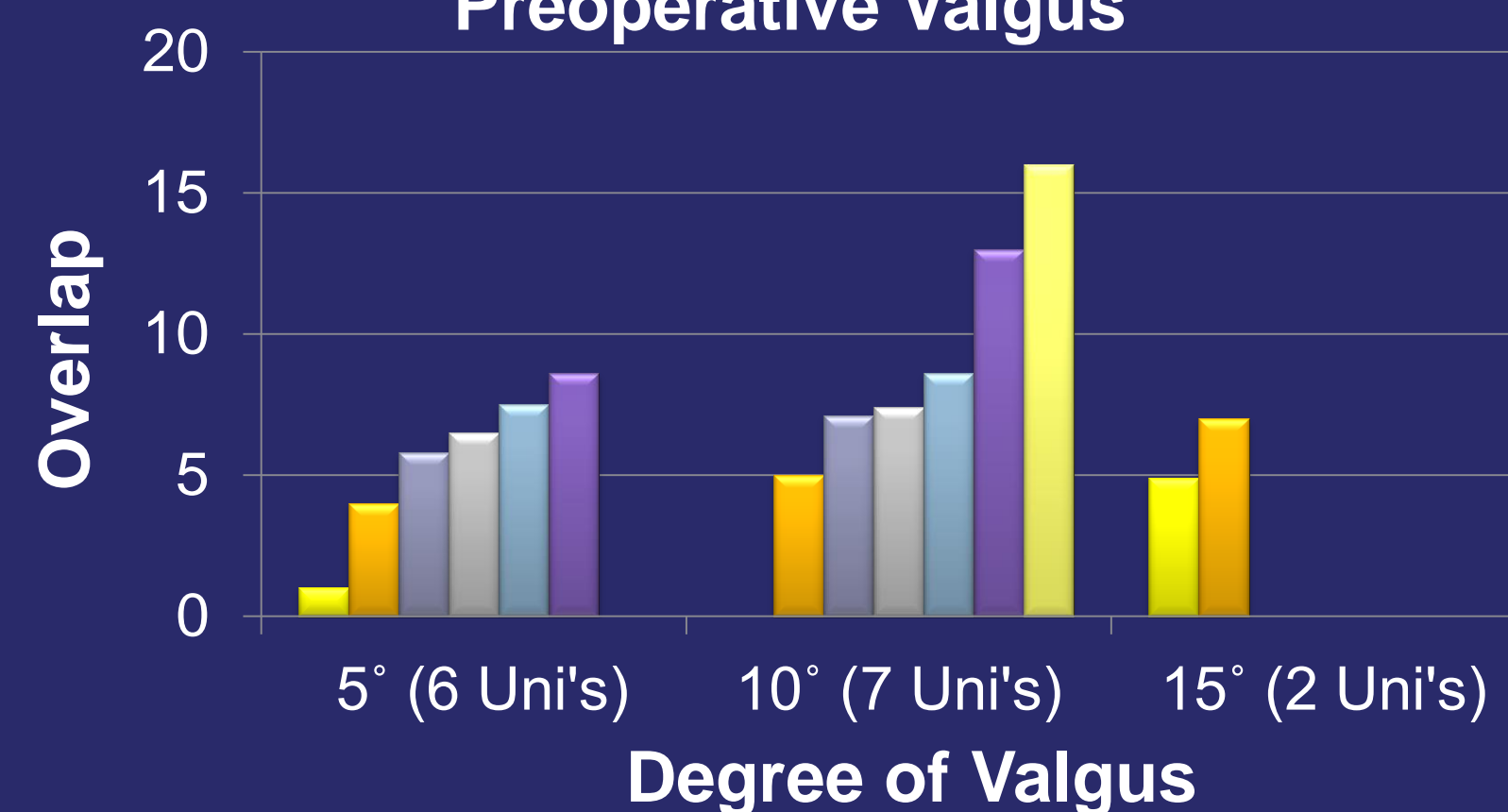
Figure 1



Figure 1 : Axial cut through a right knee at the level of the tibial spines. The measurement indicates 4 degrees of patellar tendon overlap beyond the lateral tibial spine axis.

Table 1

Degree of Patellar Tendon Overlap by Preoperative Valgus



Results

Compared to a tibial cut parallel to the lateral tibial spine, sagittal cuts based on the lateral edge of the patellar tendon resulted in a mean of 7.1° (range, 0.6° to 13°) of excessive external rotation.

The mean preoperative anatomic alignment was 8° valgus (range, 0° to 15° valgus). In order to make a cut parallel to the lateral tibial spine, the average measured distance into the patellar tendon was 7mm. The amount of preoperative valgus was not predictive of the amount of tendon overlap (Table 1).

Conclusion

Excessive external rotation of the tibial component in lateral UKA may occur if the lateral edge of the patellar tendon is used as a landmark to perform the sagittal tibial cut. This may result in rotational mismatch between the femoral and tibial components, leading to suboptimal kinematics, reduced contact area and compromised durability after lateral UKA. An increase in the Q-angle with valgus knees may lead to greater overlap between the patellar tendon and lateral tibial spine.

Clinical Relevance

In lateral UKA, the patellar tendon can interfere with the sagittal tibial cut, forcing relative external rotation of the component. A vertical transpatellar tendon incision may be an option to make the sagittal cut in line with the lateral tibial spine. On average, this tendon split will be 7mm from the lateral border of the patellar tendon.