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## THE RELATIONSHIP OF NON-ANATOMICAL **TUNNEL POSITION AND REVISION ANTERIOR** CRUCIATE LIGAMENT RECONSTRUCTION

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# Background

Anterior cruciate ligament (ACL) graft failure is a complication that can occur after ACL reconstruction surgery and may require revision. Non-anatomical tunnel placement, trauma and biological factors are some of the causes of this failure. Studies have shown that the most common reason for revision is technical errors and the most common error is non-anatomical tunnel placement.

### Purpose

The aim of this study is to examine the relationship between tunnel placement and revision ACL reconstruction.





## Methods

Patients who underwent revision ACL reconstruction were analyzed retrospectively. 37 patients who underwent revision ACL reconstruction in 2015-2022 and had preoperative computed tomography imaging were included in the study. 34 patients who had primary ACL surgery, had no graft failure and had postoperative computed tomography imaging were included in the study as a control group. Femoral and tibial tunnel positions were determined according to the quadrant method with the help of 3D reconstructions obtained from computed tomography images. The center of the femoral tunnel was measured in both the posterior-anterior (PA) and proximal-distal (PD) dimensions and represented as a percentage of total distance. Also, the center of the tibial tunnel was measured in the both anterior-posterior (AP) and medial-lateral (ML) dimensions and represented as a percentage of total distance.



# Revealing tunnel placement with the help of 3D reconstruction







## Results

When the tunnel placements in the femoral PA dimension were compared, the tunnel placement was significantly more anterior in the revision group(p=0,001). When tunnel placements in the femoral PD dimension were compared, tunnel placement was significantly more proximal in the revision group(p=0,001). When evaluated in terms of tibial tunnel location in the ML dimension, there are almost the same and this difference was not statistically significant. However, when the AP dimension was compared, it was observed that the tunnel placement was more posterior in the revision group (p=0,003).



### **Tibial and Femoral Tunnel Placements**



Blue points: Primary ACL reconstructions with no graft failure

Red points: Revision group



### Conclusion

This study revealed the importance of tunnel placement. According to this retrospective study; more proximal and more anterior femoral tunnel placement, and more posterior tibial tunnel placement were found to be risk factors for revision. Surgeons can reduce the risk of revision by making the femoral tunnel placement anatomical.



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