

The Posterior Cruciate Ligament: An Anthropometric Study in Asians and Evaluation of Safe Limits for Bony Tunnel Creation During Reconstruction

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Abstract

Introduction: Quantitative data regarding the dimensions of the posterior cruciate ligament (PCL) and its insertions have not been studied in Asians, and concerns have been raised regarding the danger of vascular injury when the bony tunnels are created during arthroscopically-assisted reconstruction. **Materials and Methods:** Ten male cadavers were used in this study, incorporating dissection and procedural arms. In the procedural arm, the path of the drill bit was tracked fluoroscopically as the tibial and femoral tunnels were created during simulated reconstructive surgery, and the effect of varying knee flexion angles was studied. Fluoroscopic images were analysed using specialised image processing software. **Results:** The mean length of the PCL at full extension was 37.7 ± 1.9 mm, and the mean mid-substance width was 13.7 ± 1.7 mm. The mean sagittal distance between the exit point of the tibial tunnel and the anterior surface of the popliteal artery, across all knee flexion positions, was merely 6.0 mm (range, 2.8 to 10.2 mm). This distance tended to increase with increasing knee flexion, but this was not statistically significant. The mean distance between the exit point of the femoral tunnel and the femoral artery was 51.1 mm (range, 42.1 to 59.0 mm). **Conclusions:** The dimensions of the PCL and its insertions in Asians do not vary greatly from those reported for Western subjects. The distance from the exit point of the tibial tunnel to the popliteal artery is very small and, although this distance increases with increasing knee flexion, the improvement in the safety margin may neither be clinically nor statistically significant. The margin of safety for drilling of the femoral tunnel is much greater.

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