

## ORIGINAL RESEARCH

## CADAVERIC EVALUATION OF THE LATERAL-ANTERIOR DRAWER TEST FOR EXAMINING POSTERIOR CRUCIATE LIGAMENT INTEGRITY

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## ABSTRACT

**Background:** Common clinical tests often fail to identify posterior cruciate ligament (PCL) ruptures, leading to undetected tears and potential degenerative changes in the knee. The lateral-anterior drawer (LAD) test has been proposed but not yet evaluated regarding its effectiveness for diagnosing PCL-ruptures.

**Hypothesis:** The LAD will show greater tibial translation values in lateral-anterior direction in a PCL-Cut condition compared to a PCL-Intact condition, thus serving as a useful test for clinical diagnosis of PCL integrity.

**Study Design:** Descriptive laboratory study.

**Methods:** Threaded markers were inserted into the distal femur and proximal tibia in eighteen cadaveric knees. Each femur was stabilized and the tibia translated in lateral-anterior direction for the LAD test versus in a straight posterior direction for the posterior sag sign (PSS). Each test was repeated three times with the PCL both intact and then cut, in that order. During each trial, digital images were captured at start and finish positions for the evaluation of tibial marker displacement. Tibial marker translation during each trial was digitally analyzed using photography. The PSS values served as a reference standard.

**Results:** The LAD tibial translation was significantly greater ( $U = -3.680$ ;  $p < 0.002$ ) during the PCL-Cut ( $10.6 \pm 5.6\text{mm}$ ) versus PCL-Intact ( $7.7 \pm 5.1\text{mm}$ ) conditions. The PSS tibial translation was significantly greater ( $U = -3.724$ ;  $p < 0.002$ ) during the PCL-Cut ( $11.0 \pm 5.3\text{mm}$ ) versus PCL-Intact ( $6.4 \pm 3.5\text{mm}$ ) conditions. There was no significant difference ( $t = 2.029$ ;  $p = 0.07$ ) in mean tibial translation in respective directions after PCL dissection during the LAD test ( $2.9 \pm 2.1\text{mm}$ ) versus the PSS ( $4.6 \pm 2.8\text{mm}$ ).

**Conclusion:** The LAD test detected changes in cadaveric tibial translation corresponding with changes in PCL integrity to a degree at least as effective for assessing PCL integrity as the PSS. Further clinical study will be required to assess the utility of the LAD as a physical examination tool for diagnosing PCL injuries.

**Level of Evidence:** 2 (laboratory study)

**Key words:** Lateral-anterior drawer test, posterior cruciate ligament, tibial translation

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