



Axial Linear Patellar Displacement: A New Measurement of Patellofemoral Congruence. Urch SE, Tritle Ben, Shelbourne KD, Gray T.
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ABSTRACT

Background: The tools for measuring the congruence angle with digital radiography software can be difficult to use; therefore, we sought to develop a new, easy, reliable method for measuring patellofemoral congruence.

Hypothesis: The linear displacement measurement will correlate well with the congruence angle measurement.

Study Design: Cohort study

Methods: On Merchant view radiographs obtained digitally, we measured the congruence angle and a new linear displacement measurement on preoperative and postoperative radiographs of 31 patients who suffered unilateral patellar dislocations and 100 uninjured subjects. The linear displacement measurement was obtained by drawing a reference line across the medial and lateral trochlear facets. Perpendicular lines were drawn from the depth of the sulcus through the reference line and from the apex of the posterior tip of the patella through the reference line. The distance between the perpendicular lines was the linear displacement measurement. The measurements were obtained twice at different sittings. The observer was blinded as to the previous measurements to establish reliability. Measurements were compared to determine whether the linear displacement measurement correlated with congruence angle.

Results: Intraobserver reliability was above $r^2=0.90$ for all measurements. In patients with patellar dislocations, the mean congruence angle preoperatively was 33.5° compared with 12.1 mm for linear displacement ($r^2=0.92$). The mean congruence angle postoperatively was 11.2° compared with 4.0 mm for linear displacement ($r^2=0.89$). For normal subjects, the mean congruence angle was -3° , and the mean linear displacement was 0.1 mm.

Conclusions: The linear displacement measurement was found to correlate with congruence angle measurements and may be an easy and useful tool for clinicians to evaluate patellofemoral congruence objectively.