

## Degree of Articular Injury as Measured by CT Is Associated with Poor Physical Function Following the Treatment of Bicondylar Tibial Plateau Fractures

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**Purpose:** Clinical outcome of bicondylar tibial plateau fractures (AO/OTA classification type 41-C) has been associated with obtaining leg alignment and restoring condylar width. While intuitive, the degree of direct articular injury has not been linked to outcomes in patients with bicondylar tibial plateau fractures. The aim of the study was to quantify the articular surface disruption on CT and to assess for any correlation between the degree of articular injury and patient-reported physical function.

**Methods:** This is a retrospective cohort study of patients undergoing surgical repair for bicondylar tibial plateau fractures at 2 Level-I trauma centers between 2013-2016 and who could complete the patient-reported outcome survey. Preoperative CT scans were selected to create a best-fit surface with a 3-mm slice thickness. The articular surface disruption was calculated as the percentage of the entire tibial plateau (Fig. 1). We performed interobserver/ intraobserver calculations and Pearson correlation to assess associations between percentage of disrupted articular surface and PROMIS (Patient-Reported Outcomes Measurement Information System).

**Results:** 57 patients with an average age of  $58 \pm 14.3$  years and average follow-up of  $3.6 \pm 1.0$  years were included. Intraclass correlation coefficient for the CT measurement was 0.9 (95% confidence interval [CI] 0.79- 0.96). The average PROMIS score was 45.5 (standard error [SE] 3.8). There was a correlation between percentage of articular surface disruption and total PROMIS scores (0.4, CI: 0.2-0.5,  $P = 0.007$ ).

**Conclusion:** The calculation of articular surface disruption is a simple, reproducible, and accurate method for assessing the degree of articular damage in patients with bicondylar tibial plateau fractures. We found that the degree of articular injury, as measured by the percentage of articular surface disruption, correlates well with patients' physical function as measured by the PROMIS instrument at a minimum of 2-year follow-up.

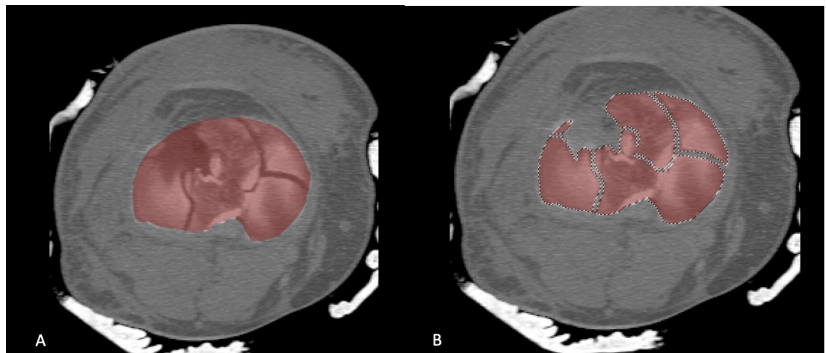


Figure 1 demonstrating an axial CT scans at 3mm slice (A) outlining the expected normal tibial articular surface and (B) subtraction of any absent/depressed/comminuted articular segments of the joint.

See the meeting app for complete listing of authors' disclosure information.