Efficacy of Accessory Facet Views in the Detection of Occult Patellar Malreduction

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Purpose: Precise reduction and stable fixation of patella fractures is crucial to optimizing patient outcomes and limiting incidence of patellofemoral arthrosis. In the absence of adjunctive surgical measures, intraoperative fluoroscopy remains the primary means for judging articular surface reduction. The purpose of this study was to determine the ability of the previously defined medial and lateral patellar facet views to detect variable magnitudes of articular displacement in a simulated fracture model.

Methods: This study was performed in Sectra 3D Trauma, a 3-dimensional (3D) templating software that permits splitting and segmentation of bone fragments, and conversion of 3D renderings to fluoroscopic images. Transverse patellar fractures were simulated in 10 consecutive patients and 2 modes of displacement were evaluated: (1) medial and lateral translation (MT, LT) of the distal fragment with respect to the proximal fragment, and (2) rotational malalignment along the longitudinal axis of the patella. Translational displacement was introduced in 1-mm increments while rotational malalignment was introduced in 5° increments.

Results: On average, the true lateral view could accurately detect 4.5 mm (range, 3-7 mm) of MT and 5.5 mm (range, 4-6 mm) of LT. In contrast, the medial facet view could reliably detect a mean of 1.6 mm (range, 1-3 mm) of MT and a mean of 3.1 mm (range, 1-5 mm) of LT. Finally, mean LT of 2.4 mm (range, 2-4 mm) and mean MT of 3.4 mm (2-5 mm) could be accurately detected with the lateral facet view. With respect to rotational malalignment, the facet views did not confer a significant advantage over the true lateral view within the 5-mm increments employed in this study.

Conclusion: Accurate reduction and stable fixation are imperative for optimal outcomes following patellar fracture osteosynthesis. Utilization of the medial and lateral patellar facet views considerably improves detection of occult articular surface malreduction in comparison to the true lateral view.