

The Utility of Intraoperative Arthrogram in the Management of Pediatric Lateral Condyle Fractures of the Humerus

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Purpose: Arthrograms are commonly used to assess articular reduction in conjunction with closed reduction and percutaneous pinning (CRPP) of pediatric lateral condyle fractures of the humerus, but there is no clear consensus on the indications for arthrogram use. The purpose of this study is to determine how intraoperative arthrogram affects the management of pediatric lateral condyle fractures.

Methods: An IRB-approved retrospective chart review of all lateral condyle fractures treated at an academic urban pediatric Level I trauma center from 2008-2014 was performed. Injury parameters, initial fracture displacement, and complications were compared between fractures managed with and without an arthrogram as well as between those that had an arthrogram prior to fixation and those in which the arthrogram was performed following reduction and fixation.

Results: 875 patients with lateral condyle fractures were identified of which 107 patients underwent intended CRPP. 58 patients were treated with CRPP without arthrogram, and 49 with arthrogram. Of those who had an arthrogram, 22 (45%) were performed after fixation and 27 (55%) before definitive fixation. Management was changed in 4 patients (14.7%) who had arthrograms prior to fixation versus no patients who had arthrograms after definitive fixation ($P = 0.060$). Of those in whom the arthrogram altered the surgical plan, 3 patients were converted to open treatment and one was converted to cast without pins. Mean preoperative displacement was similar in patients treated with and without arthrograms (3.04 mm vs 2.91 mm, $P = 0.836$); however, mean postoperative displacement was lower in patients without arthrograms (0.91 vs 1.68 mm, $P < 0.001$). There were no significant differences in age, weight, energy mechanisms of injury, or complication rates between either of the groups.

Conclusion: Utilizing an arthrogram before CRPP resulted in a treatment change in a small percentage of patients while no patient who had an arthrogram after CRPP had a change in management. Mean postoperative displacement was lower in patients without arthrograms. Use of an arthrogram following CRPP of lateral condyle fracture may be useful to assess final fracture alignment but is unlikely to result in a treatment change and was not associated with improved postoperative alignment.