Outcomes of Epiphysiodesis About the Distal Radius and Distal Ulna

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INTRODUCTION: Wrist fractures comprise nearly 30% of all fractures in children. Fractures that damage the distal radius (DR) and/or the distal ulnar (DU) growth plates may require epiphysiodesis to prevent skeletal deformity and/or length discrepancy among the forearm bones. Epiphysiodesis is commonly used to correct leg-length discrepancies in children but has not been extensively studied for its use on the distal radius and ulna. The purpose of this study is to present the outcomes of epiphysiodesis procedures about the distal radius and/or distal ulna.

METHODS: A retrospective review was performed to identify all pediatric patients aged under 17 years who were treated surgically with a distal radius and/or distal ulna epiphysiodesis over a twelve-year period. Data collection included patient demographics, mechanism of injury, etiology of the physeal arrest, and technique of the epiphysiodesis. Outcomes of interest included time from epiphysiodesis to complete physeal closure, return to activities, and complications. Associations between patient characteristics and outcomes were determined using univariate and multivariate logistic regressions.

RESULTS:

Thirty-four patients with an average age of 13 years (Range: 10-16 years) were identified. Initial physeal arrest was caused by a fracture in 30 (88%) patients, a Madelung deformity in 3 (8.8%) patients, and an osteochondroma in 1 (2.9%) patient. Subsequently, 17 (38%) epiphysiodesis procedures were performed in the distal ulna, 2 (5.9%) were performed in the distal radius, and 15 (44%) were performed concomitantly in the distal radius and distal ulna.

Following the epiphysiodesis, the median time to physeal closure was 8.4 weeks (IQR: 7.1,10.9 weeks). Four patients experienced transient complications after distal ulnar epiphysiodesis, including 2 (5.9%) patients with tenderness to palpation in the TFCC region, 1 (2.9%) patient with pain on the ulnar side of the wrist and tendonitis, and 1 (2.9%) patient with finger flexor tightness and mildly decreased sensation of the ulnar nerve. No complications were identified following distal radius epiphysiodesis. All physes closed completely following the epiphysiodesis procedures. There was no significant difference in outcomes based on sex, traumatic etiology, and treatment timeline.

DISCUSSION AND CONCLUSION: Epiphysiodesis of the distal radius and/or distal ulna is a well-tolerated and beneficial procedure. The physis completely closes by around 8 weeks (2 months) following the procedure. Distal radius epiphysiodesis procedures are very safe and distal ulna epiphysiodesis procedures have a low complication rate, mainly persistent pain on the ulnar aspect of the wrist that resolves with time. This series did not identify any cases that required a return to the operating room due to an incomplete closure of the physis.