Age Is a Predictor of Elbow Stiffness After Type III or IV Supracondylar Humerus Fracture

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Purpose: Supracondylar humerus (SCH) fractures are common pediatric injuries that occur throughout childhood. There is little information in the literature on the effect of age on outcomes of SCH fractures. The purpose of this study is to investigate outcomes of SCH fractures in children at different ages of skeletal development.

Methods: Retrospective review was conducted on patients with SCH fractures who were treated from 2010 to 2014 in a tertiary care pediatric hospital. Patients aged <18 years with a type III or IV SCH fracture who underwent percutaneous pinning were included. Medical charts and radiographs were reviewed for demographics, operative and fluoroscopic time, and complications. Patients were categorized into age-based groups (<2 years, 4-6 years, and >8 years) and compared for differences in characteristics and outcomes.

Results: 190 patients with 190 SCH fractures met inclusion criteria. Mean age was 5.7 ± 2.7 years (range, 0.2-13) and mean follow-up was 3.2 ± 3.2 months (range, 0.5-26.1). 138 patients (73%) had a type III SCH fracture and 52 (27%) had a type IV fracture. There were 26 patients aged <2 years, 111 aged 4-6 years, and 53 aged >8 years. Age was a significant predictor of nerve palsy on admission, mean operative time (<2 years = 21.8 min; 4-6 years = 43.0 min; >8 years = 80.7 min; P <0.001) and mean fluoroscopy time (<2 years = 22.9 sec; 4-6 years = 59.5 sec; >8 years = 171.9 sec; P <0.001). 77% of patients had full range of motion in elbow flexion at final follow-up in those <2 years of age, compared to 66% in the 4-6 years group and 43% in the >8 years group (P = 0.005). 96% of patients in the <2 years group had full range of motion in elbow extension at final follow-up, compared to 88% in the 4-6 years group and 64% in the >8 years group (P < 0.001). Age was not a significant predictor of need for open reduction (P = 0.22). There were no differences in the incidence of complications including compartment syndrome (P = 0.60), pin tract infection (P = 0.19), cubitus varus (P >0.999), or reoperation (P = 0.87) among groups.

Conclusion: Increasing age is associated with increased elbow stiffness after operative fixation of type III and IV SCH fractures.