

## **MRI Findings in the Elbow Among Pediatric Baseball Players Based on Skeletal Maturity**

### **PURPOSE**

To characterize the spectrum of MRI findings in the elbow among youth baseball players with respect to regional skeletal maturity and surgical intervention.

### **METHODS AND MATERIALS**

This IRB-approved, HIPAA-compliant retrospective study analyzed consecutive baseball players (<18 years), who underwent elbow MRI at our free-standing children's hospital in the past 11 years (2010-2021). Two radiologists reviewed each examination independently to categorize regional skeletal maturity and findings within the medial, lateral, and posterior elbow. Findings were compared between maturation groups and logistic regression models were used to identify predictors of surgery.

### **RESULTS**

This study group of 136 children (115 boys, 21 girls) included 89 skeletally immature (12.7±2.3 years) and 47 skeletally mature children (16.2±1.0 years, p<0.01). Kappa coefficient ranged 0.64-0.96 and percent agreement ranged 86%-99%. Elbow effusion (27% vs 9%, p=0.02), medial epicondyle marrow edema (52% vs 15%, p<0.01), avulsion fractures (19% vs 2%, p=0.01), and osteochondritis dissecans (OCD, 24% vs 6%, p=0.02) were significantly more common among skeletally immature children whereas sublime tubercle marrow edema (10% vs 47%, p<0.01) and triceps tendinosis (19% vs 38%, p=0.03) were more common among skeletally mature children. Presence of intra-articular body (OR=22.8, 95% CI 2.2-466.8, p=0.02) and OCD (OR=6.6, 95% CI 1.6-29.3, p=0.01) were independent predictors for surgery.

### **CONCLUSIONS**

Differential patterns of MRI findings were observed in the elbow in our study group of symptomatic pediatric baseball players, which correlated with regional skeletal maturity. The presence of intra-articular body and OCD, but not skeletal maturity, were independent predictors of surgery.

### **CLINICAL RELEVANCE/APPLICATIONS**

With increasing sports participation and prevalence of elbow injuries among youth baseball players, a comprehensive assessment of various sites of stress in the context of functional anatomy and regional skeletal maturity can improve diagnostic accuracy, ensure timely intervention, and reduce long-term morbidity.