LATERAL ELBOW OVERUSE INJURIES IN PEDIATRIC FEMALE GYMNASTS: A COMPARISON OF RADIAL HEAD STRESS FRACTURES AND CAPITELLAR OCD

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Background:
Radial head stress fractures (RHSF) and capitellar osteochondritis dissecans (OCD) are rare and may be seen in pediatric gymnasts. Clinical and radiographic factors correlating with these differential lesions are unclear.

Purpose:
To describe the clinical presentation of RHSF and compare the demographic, radiographic, and clinical characteristics of elbows in pediatric gymnasts presenting with RHSF to those presenting with OCD of the capitellum.

Methods:
An IRB-approved retrospective review of consecutive female gymnasts treated within a pediatric sports medicine practice for either RHSF or capitellar OCD over a 5-year period (1/2014-2/2019) was performed. Gymnasts <18 years old at the time of injury presenting with signs of a radial head stress fracture (Salter-Harris III or IV) or with diagnostic features of capitellar OCD were included. Those with congenital anatomic elbow abnormalities or prior ipsilateral elbow surgery were excluded. Patients were dichotomized into either the RHSF or OCD group; and demographic, radiographic, and clinical characteristics were compared. Statistical analysis was performed using a Mann-Whitney test for continuous variables and a chi-square test for categorical variables.

Results:
Forty-five patients (9 with bilateral OCD, 1 with bilateral RHSF, and 3 with each lesion in alternate elbows), contributing 58 elbows, met inclusion criteria. Thirty-nine elbows in the OCD group and 19 elbows in the RHSF group were studied. Average age for all gymnasts was 11.58 years (9-16 years), with no difference between groups (OCD: 11.47 vs RHSF: 11.78; p=0.34). No differences in height, weight, BMI, or laterality were noted. Gymnasts presenting with RHSF were competing at a higher level than those with OCD, with 94.74% of RHSF group competing at level 7 or greater compared to 66.67% of OCD patients (p=0.02).
Compared to those with OCD, the RHSF group presented more acutely following onset of symptoms (p=0.014), reported significantly more pain with valgus stress (p<0.001), and concurrent medial elbow pain than those with OCD (p<0.01).

The RHSF group demonstrated significantly smaller distal humeral width and decreased height of the proximal radial epiphysis, as well as increased valgus angulation of the radial neck shaft angles and distal humeral articular surface (p<0.05). No differences in olecranon or medial epicondyle hypertrophy, or avulsive changes were identified. (Table I)

**Conclusion:**

Gymnasts competing at a high competitive level and presenting more acutely may be at risk for RHSF. Additionally, differing anatomy in the lateral elbow may be a predisposing risk factor for RHSF as opposed to OCD and merits further investigation.