A longitudinal study focusing on the morphology of the medial epicondyle in youth baseball players

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INTRODUCTION:

Little League Elbow is one of the most common conditions causing elbow pain in youth baseball players and often presents with segmental changes in the medial epicondyle, but few reports have investigated later changes in the morphology of the medial epicondyle associated with their growth.

The purpose of this study is to conduct a long-term study of changes over time in the medial epicondyle of youth baseball players observed during baseball elbow examinations using ultrasound and plain X-ray.

METHODS:

2487youth baseball players (ages 9 to 15) who participated in baseball elbow examinations between 2010 and 2023 were examined by ultrasound and X-rays, irrespective of whether or not they had symptoms. Of these, three years or more of follow-up observation were possible for 320 players, who were then examined in terms of the successive changes in the morphology of the medial epicondyle. Images of the medial epicondyle of each player's elbow were classified as normal, segmentation, or protrusion by two experienced orthopedic surgeons and one experienced radiologist. In this study, even if the segmentation was slight, it was classified as segmentation if findings were observed on X-rays. Furthermore, we investigated the characteristics of morphological changes in the medial epicondyle of the elbow during the growth period by evaluating the longitudinal changes in the same players.

RESULTS:

Segmentation were observed in 241/320(75.3%) players during the three-year follow-up observation period, but fusion at the site of segmentation was observed in 221/241 (91.7%) players at the time of the final follow-up observation. In addition, among cases where fusion was observed, there were also some cases where the morphology of the medial epicondyle at the time of the final follow-up observation could be assessed as being substantially normal (no left/right difference); this was seen in a total of 77/241 (32.0%) players.

There were few players who showed no changes in images over a period of three years or more. On the other hand, there were a relatively large number of players who showed segmentation change during the growth process, but whose morphology became almost normal as they grew.

DISCUSSION AND CONCLUSION:

The morphology of the medial epicondyle changes successively, and even if segmentation are observed over time, growth has often been accompanied by fusion. The present study suggests that though there were some cases that exhibited segmentation in the medial epicondyle without any symptoms during the epiphyseal stage , even cases that had shown segmentation during epiphyseal patency included cases that later exhibited fusion of the medial epicondyle with substantially no left/right difference during the growth process. When evaluating the medial epicondyle of the elbow in growing baseball players, we need to consider whether the imaging findings represent pathological or adaptive changes.