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Case Report

Elbow Locking Caused by Annular Ligament in a Patient with Congenital Radioulnar Synostosis: A Case Report and Literature Review

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Abstract

Congenital radioulnar synostosis is a rare but challenging congenital elbow anomaly. Patients have severe restriction of forearm rotation, but most patients do not report flexion-extension limitation. Here we report the case of an 11-year-old boy with congenital radioulnar synostosis. He had painful snapping of the right elbow. Painful snapping, and locking occasionally, occurred at the right elbow during flexion of the elbow from extension. There was no history of trauma. Magnetic resonance imaging showed tissue structure between the radial head and capitellum. Open surgery was performed. We found a hypertrophic annular ligament between the radial head and capitellum. During flexion, the ligament got trapped between the radial head and capitellum. The hypertrophic ligament was removed. After the surgery, the patient had no recurrence of snapping or locking.

Keywords: Congenital, radioulnar synostosis, annular ligament

Introduction

Congenital radioulnar synostosis is a rare disease characterized by a separation anomaly between proximal parts of the radius and ulna (1-3). Frequent family history and association with other congenital syndromes suggest a genetic origin. Proximal parts of the radius and ulna are typically fused in these patients (1). Forearm rotation is restricted in these patients, but elbow motion is generally preserved except for patients with flexion contracture (4, 5).

In this study, we aimed to present a patient with congenital radioulnar synostosis, a rare condition that resulted in recurrent elbow locking and crepitation on range of motion.

Case Report

An 11-year-old, right-hand dominant boy was brought to our emergency department with the complaint of a painful locked elbow. His past medical history included emergency admission three times due to elbow locking. Despite medical treatment and activity restriction, patient's complaints did not regress. He had right congenital proximal radioulnar synostosis. He had neither trauma nor any history of operation of the elbow. Inspection did not reveal any ecchymosis, edema, or rash. Active extension and flexion were limited to -20° and 110°, respectively. The right forearm was in a fixed pronated position at 10°. Right elbow flexion was painful with crepitation during range of motion. Additionally, there was a history of locking in during sudden elbow movements. Locking was not elicited during examination. Flexion in the left elbow ranged between 0° and 140°; the forearm was in a fixed pronated position at 10°. Radiographs revealed an anterior radial head dislocation and a type 4 congenital radioulnar synostosis according to Cleary and Omer classification (1). Magnetic resonance imaging (MRI) showed a hypertrophic space-occupying lesion between the radius head and capitellum. MR arthrogram was not performed. Debridement of the lesion, which was the cause of the locking, with an open surgery was recommended. The patient underwent open surgery under general anesthesia. Under tourniquet control, lateral approach to the elbow was performed. By partial detachment of the extensor muscle origin and releasing the anterior joint capsule from the humerus, the radiohumeral joint was exposed. When the elbow was moved into the flexion from extension position, a fibrous band thought to be a remnant of the annular ligament, caused crepitation and locking by getting trapped between the radial head and capitellum (Figure 1). The hypertrophic tissue was excised with the preservation of the lateral collateral ligament (Figure 2). Crepitation resolved after the excision.

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Figure 1. During surgery, the hypertrophic annular ligament can be seen when the elbow is in the flexion position from extension. The annular ligament was causing crepitation and elbow locking by getting trapped between the radial head and capitellum

Figure 2. Hypertrophic annular ligament was excised with preservation of the lateral collateral ligament

Range of motion exercises were immediately initiated after surgery without cast immobilization. Histological evaluation showed ligament structure and no evident synovial tissue. Three years after the surgery, the patient has no complaints and no recurrence of elbow locking. Written informed consent was received from the parents of the patient for the publication of the case report.

Discussion

Acute elbow locking is often due to joint mouse. However, it may also be seen due to extra-articular causes, such as annular ligament subluxation, ulnar nerve dislocation, and snapping of medial head of the triceps, or in intra-articular causes, such as synovial plica impingement and posterolateral rotator instability (6-9). MRI has limited diagnostic value in patients with crepitation or elbow locking. MR arthrography is the preferred imaging modality in identifying anatomical abnormalities inside the joint (5, 7). The most valuable diagnostic and therapeutic tool is the arthroscopic approach. This approach allows the intraarticular pathology to be directly observed, and elbow dynamic examination to be evaluated. Pathologic tissues can be removed with this tool (5, 6, 10).

This is the third case report of elbow locking in a patient with radioulnar synostosis in the English literature. Masuko et al. (3) reported two radioulnar synostosis cases with elbow flexion contracture due to the presence of annular ligament-like tissue. They described good outcome with excision of the annular ligament-like tissue, as we performed in our case. Shinora et al. (5) operated on two patients: one presented with painful snapping and the other with elbow locking. They found a tight fibrous tissue trapping the radial head, and arthroscopic removal of the fibrous tissue resolved the symptoms. Shin et al. (4) reported one radioulnar synostosis case with limitation of elbow flexion due to enlarged radial head. They excised approximately 15 mm of the radial head and 6 months later, there was full flexion of the elbow.

Conclusion

Annular ligament-like fibrous band is rarely seen in patients with congenital radioulnar synostosis, but it can result in elbow locking, and should, therefore, be considered for elbow locking.

Informed Consent: Written informed consent was obtained from the patient who participated in this study.

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