A Case of Throwing Fracture of the Humerus in an Amateur Baseball Pitcher

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Spiral fractures of the humerus that occur during throwing, such as in baseball, are not very common but have been well described in orthopedics and sports medicine. They are known to occur by sudden extreme muscular action while throwing balls. I report on a case of spiral fracture of the humerus shaft while pitching in a baseball game with a review of the literature.

Key Words: Humerus fracture, Spiral fracture, Sports, Baseball, Throwing

Introduction

The powerful twisting of the humerus that occurs during throwing objects can lead to spiral fractures of the humeral shaft. Fractures of the humerus that occur during throwing balls, such as in a baseball game, are not uncommon and have been well described in orthopedics or sports medicine. Baseball-related injuries are mostly caused by direct contact from the hitting or throwing balls and running the ground. However, humeral spiral fractures without any external injuries are rare. I present a case of spiral fracture of the humerus shaft while pitching at baseball game with review of the literatures.

Case Report

A 25-year-old male amateur baseball player was admitted to emergency room because severe left elbow pain developed while he was pitching. His left upper arm was fixed on his chest with internal rotated state and his shoulder and elbow had no movement due to pain. On initial examination, severe tenderness and swelling on left elbow and slight limitation of joint movement at left elbow were revealed, but the motor and sensory functions of the left wrist and fingers were intact and no obvious deformity or external wound were visible. The patient was a student and also a recreational athlete, participating in baseball games on vacation, he had neither prodromal pain nor history of any arm problems. Radiograph showed a spiral fracture at distal portion of the left humeral shaft (Fig. 1A). The patient was diagnosed a throwing fracture of the left humerus. He was once placed in arm splint with reduction prior to operation and after then he was operated by open reduction and internal fixation with a broad metallic plate (Fig. 1B). A week later, he was discharged without any pains or limitations of motion at left elbow and shoulder.

Discussion

Since a fracture of the humerus that occurred in a healthy boy on throwing a stone was reported in 1895, other authors have noted fractures of the humerus that have occurred while throwing objects. Branch et al. reported 12 cases of spontaneous fracture of the humerus during pitching, and Ogawa and Yoshida reported 90 cases of throwing fracture of the humeral shaft.

Many theories exist regarding the causes of such injuries, including muscular antagonism, violent uncoordinated muscle action, faulty throwing style, excessive torsional force, and fatigue fracture.

Branch et al. noted four risk factors that are clearly associated with these fractures: 1) age over 30 years, 2) a prolonged period of layoff from pitching, 3) lack of a
regular exercise program, and 4) prodromal throwing arm pain.

Ogawa and Yoshida\(^6\) reported that fractures are likely to occur in players who practice infrequently and that such fractures tend to occur during the acceleration phase of throwing. They are most likely to occur at the junction of the middle and lower thirds of the humerus. In this case, it might be caused by a prolonged period of layoff from pitching on the lack of a regular exercise because he is a student, on vacation, and it was occurred at the end of innings.

On physical examination, it is often confused by elbow sprain or muscle spasm, and children’s pulled elbow, because the injured patient come on the posture of his arm on the chest like pulled elbow, so emergency physicians should be ruled out at any cases before confirmation of injuries.

A fracture of the humerus in a baseball pitcher after biceps tenodesis is an uncommon complication, but it can have devastating consequences. This complication has been described in patients in whom a keyhole technique was used or in patients in whom an interference screw was used for the biceps tenodesis procedure\(^5,8\).

Recurrent fracture of the humerus after ball-thrower’s fracture is rare. In a literature search we found 10 cases and also one case that occurred for a third times\(^1\).

Ball-thrower’s fractures of the distal humerus are typically spiral fractures in the mid-distal humerus. In Ogawa’s series of 90 patients, all fractures are described as external rotation spiral fractures. The most common additional findings associated with these fractures are medial butterfly fragments and radial nerve palsy\(^3,5,7,10,11\). But, in this case, on initial physical examination or after operation, no any complications including radial nerve palsy were showed.

Treatment of ball-thrower’s fracture is almost nonoperative, closed reduction is accomplished by the use of a hanging arm cast, coaptation splint, clam shell splint, humeral sleeve orthosis and its equivalent for 6~8 weeks. After conservative treatment, most of the patients had an remarkable recovery and has resumed their normal activities. Surgical treatment including open reduction and internal fixation should be considered in cases involving open fractures, vascular injury, markedly displaced segmental fractures, fractures in which interposed soft tissue prohibits reduction, fractures associated with elbow injuries requiring early mobilization, and fractures in which radial nerve dysfunction occurred after closed reduction when the radial nerve had been functioning initially\(^5,11-13\). In this case, surgical open reduction with internal fixation and casting was done for the early mobilization and rehabilitation in spite of no any complications because he is a student. He is regularly followed up after operation and returned to his position without

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Fig. 1. (A) Initial radiograph showed the spiral fracture with displacement of distal portion of the left humeral shaft. (B) Surgically reduced and fixed state of the fractured distal humerus with the metallic devices was showed.
any complications, and should be considered rehabilitation and return to playing baseball after several months.

Some authors recommend that return to throwing sports will be allowed when strength returns after at least 3 months of the gradual range-of-motion and strengthening program\textsuperscript{13,14}.

In conclusion, injury prevention is more important than treatment after injury, so author recommend that prevention of recurrent fracture involves not overloading the humerus, improving joint function as early as possible to prevent contracture, improving muscle power, improving bone density, and ensuring that the patient uses correct throwing techniques\textsuperscript{11}.

**REFERENCES**