Distal Bicep Brachii Tendon Rupture in Collegiate Football Player

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Background: A 21 year-old male football player suffered an acute distal bicep brachii tendon rupture, with retraction to the myotendineal junction in his left arm. Mechanism of injury: athlete states he was attempting to tackle, grabbed opponent with arm extended while simultaneously having elbow hit from the back. Initial assessment found a "Window Shade" defect in distal 1/3 of anterior brachium. There was swelling along the bicep brachii, superior to the “window shade” defect. Severe point tenderness was noted along and throughout distal biceps brachii tendon into cubital fossa and proximal 1/3 antebrachium. Positive pain present throughout passive and active elbow extension. No other special tests were performed at this time due to severe pain. Initial treatment: Involved arm was placed in sling and ice bag applied on field; a Jones compression wrap was applied and RICE advised. Athlete was referred to orthopedist. Differential Diagnosis: Cubital bursitis, bicipital tendinosis, entrapment of lateral antebrachial cutaneous nerve, elbow dislocation, radial head fracture and distal bicep brachii tendon rupture. MRI confirmed complete rupture of the biceps brachii distal tendon. Treatment: Surgery was performed 12 days post-injury. Pre-surgery treatment: RICE, Fluidotherapy with gentle forearm supination/pronation, and putty squeezes. Post-operative therapy: Fluidotherapy with active wrist ROM; PROM wrist flexion/extension, ulnar/radial deviation, elbow flexion/extension; putty squeezes. Exercises progressed to resisted wrist flexion/extension, radial/ulnar deviation and bicep curls with wrist pronation and supination. Uniqueness: Typically, bicep brachii tendon ruptures occur to the proximal tendon, either the long head or short head tendon arising from the scapula. Very few injuries occur to the distal tendon of the biceps brachii; with approximately 3% cases reported of individual’s ages 30-50 years old. Review of literature found that subjects experiencing distal tendon rupture have reported a history of biceps brachii tendonitis, overuse of the biceps brachii, and/or anabolic steroid abuse. These factors can influence weakness and/or degeneration of the tendon, increasing the risk of tendon rupture distally. Other documented mechanisms are an overload caused by a forceful eccentric contraction, resisted flexion, or falling on outstretched hand (FOOSH). If early recognition and surgical intervention of the tendon rupture is not made, severe atrophy in the distal bicep tendon near the radial tuberosity occurs, leading to loss of normal biceps brachii function. Conclusion: In football, there is an increased risk of musculoskeletal injuries due to the physical nature of the game during tackling. Subsequently, a degree of high velocity impact incidences occur, which can result in traumatic injury to the musculoskeletal system, though acute rupture to the distal bicep brachii tendon is a rare occurrence. It is not evident whether there were any predisposing factors influencing this injury. The athlete denied any previous injury to the biceps brachii muscle or tendon; he denied ever using anabolic steroids. A possible explanation of the acute tendon rupture is the sudden, forceful eccentric load of the bicep brachii, which produced a torque of magnitude too great for the biceps brachii resist. Additionally, the tendon’s elastic structure may have deteriorated prior to injury, creating a deficiency of the musculotendinous unit to adequately resist the force created from simultaneous impact and muscle contraction. Lastly, it is important that surgical repair is performed early in the acute stage to increase the return of normal function of the biceps brachii. Nonoperative therapy of a distal biceps brachii tendon rupture will typically result in large deficits of elbow and forearm ROM, consequently producing a 40% deficit in supination and 30% deficit of elbow flexion strength. Word Count: 597.