Occult Fracture of the Transverse Process at T1 in a High School Football Player

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The purpose of this case report is to increase awareness of an injury that involves occult fracture of the T1 transverse process. Occult fracture may be confused with other more common injuries to the shoulder and neck, but should always be considered in the differential diagnosis.

The case involved a fifteen-year-old White male who simultaneously played both middle school and high school football. He was 5’11”, 165 lbs, and played at a linebacker position. He was right-hand dominant and had no history of previous injury to his neck or shoulder regions.

During a high school freshman team game, he reached out with his right hand in an attempt to tackle an opponent. His shoulder was forced into a position of abduction and external rotation and an anterior force was applied to the forearm, which produced a traction-type injury. He continued to play for the remainder of the game without reporting that the injury had occurred. The following day, he complained of mild pain in his right posterior shoulder, with some pain radiating into his neck.

The initial examination performed by an athletic trainer did not identify the existence of shoulder instability, but apprehension testing of the right shoulder elicited pain. No numbness or tingling was reported by the athlete. He had full active ROM and passive ROM of the shoulder, with moderate pain beyond 90° of flexion and beyond 90° of abduction. Moderate pain was also experienced at extreme passive internal rotation and during performance of resisted external rotation. Pain was also elicited by O’Brien’s test, which is performed with the patient’s shoulder at 90° of shoulder flexion and 10° of horizontal abduction. The patient internally rotates the shoulder and pronates the forearm. The examiner provides a distal resistive force as the athlete pushes upward. The procedure is repeated with the shoulder and forearm in neutral positions. A positive test elicits pain or clicking in the shoulder in the first position and reduced or absent symptoms in the second position. A positive test suggests that a labrum tear (SLAP Lesion) or acromioclavicular lesion exists. The athlete demonstrated 3/5 isometric strength for the supraspinatus and infraspinatus muscles, and tenderness was elicited by palpation along the right trapezius, supraspinatus, and infraspinatus muscles.

The athlete had full active range of motion of the neck, with some discomfort during lateral bending to the right side. There was full range of motion of the wrist and elbow, and 5/5 grip strength. Activity was restricted, and he was advised to take a non-
prescription, non-steroidal anti-inflammatory drug for relief of discomfort. Over the course of one week, the athlete displayed daily decrease in pain and improvement in strength. At the beginning of the following week, he demonstrated full strength and pain-free movements. He was allowed to return to noncontact activity that included running and sport-specific drills with pain-free movements. After one activity session, his pain and strength impairment returned.

The athlete’s parents were advised to have him evaluated by a physician the next morning. The physician noticed mild atrophy of the right supraspinatus area. Plain radiographs were unremarkable. He was restricted from participation in any football activities, and an MRI scan of the cervical spine and brachial plexus was scheduled. The MRI demonstrated a fracture of the right transverse process of T1 and inflammation of the C8 and T1 nerve roots (Figure 1). There was abnormal signal within the right T1 transverse process that extended into the right pedicle, which was interpreted to be attributable to an occult fracture.

The athlete was scheduled to receive physical therapy the next two weeks, which was prescribed to address supraspinatus and infraspinatus weakness. The athlete attended only one physical therapy session but did perform a home exercise program. An electromyography (EMG) assessment was also recommended, but it was not obtained.

The athlete returned to the physician for a follow-up evaluation at five weeks postinjury. He still exhibited mild pain and minimal strength loss. A CT scan confirmed existence of the fracture, with no evidence of other injury (Figures 2 and 3). At six weeks postinjury, the athlete had full pain-free motion of the neck and shoulder and full strength. No atrophy was evident and his neurovascular status was deemed normal. A spine specialist was consulted, who agreed with a plan to allow the athlete to gradually return to full-contact football activities over the ensuing three-week period.