Scaphoid Fracture in a College Football Athlete

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Abstract
Background: Athlete is 18-year-old (77.3 kg and 175.3 cm) male JUCO football wide receiver. Athlete's prior medical history includes fractures in both wrists. No prior surgical history. Athlete reported a violent blow to the right wrist while playing football. Athlete presented with obvious deformity, ecchymosis, or signs of trauma. Athlete was point tender and had minor swelling on radial side of wrist, over the abductor pollicis longus and extensor pollicis brevis tendons.

Findings: Initial examination revealed no obvious deformity, ecchymosis, or signs of trauma. Athlete was point tender and had minor swelling on radial side of wrist, over the abductor pollicis longus and extensor pollicis brevis tendons. No scaphoid tenderness or numbness/paresthesia was present. Athlete had full and pain free thumb ROM. Wrist extension and flexion was 0-70 degrees in all directions. Athlete had full active ROM and strength with all other wrist and hand motions. Grip strength was equal bilaterally. Athlete had a positive Finkelstein's Test, Valgus Stress Test, (+) for pain on radial side of wrist (-) for laxity, (-) Varus Stress Test. This is a left side case study and was typical of scaphoid fractures in athletes. Radiologic study process fracture, RCL sprain. Treatment: The athlete was initially diagnosed with De Quervain's tenosynovitis with athletic training staff with some relief after 2-3 weeks. Treatment involved low-level laser therapy, dry needling of extensor pollicis brevis and extensor pollicis longus, immobilization for 4 weeks, modification of football training, and wrist taping. Athlete returned to training room a few weeks later after re-injuring his wrist and was re-evaluated. Fluoroscope showed evidence of a scaphoid fracture, confirmed by X-ray and evaluation by team doctor. The athlete most likely had an old non-union fracture in the scaphoid, which had never healed. This new injury fractured the bone all the way through and displaced it. After consultation with the team doctor, it was decided that the athlete would undergo surgical repair of the scaphoid. During the surgery, necrosis was found, and the scaphoid bone was surgically revascularized using a graft from the radius. Despite the high incidence of scaphoid fractures, they can be difficult to diagnose, healing to delayed treatment and complications such as non-union and avascular necrosis. Often the history has indicated that failure to recognize a scaphoid fracture may result in non-union in 5-25% of all cases and avascular necrosis in 13-30% of cases. Tenderness in the anatomical snuffbox and falling on an outstretched hand are thought to be the two cardinal signs of a scaphoid fracture. However, there are cases such as this one in which neither sign is present. This case highlights the unique diagnosis and surgical treatment of an athlete suffering from a scaphoid fracture. This case further highlights the complications that can occur due to delayed diagnosis and treatment of scaphoid fractures. It also emphasizes the importance of early diagnosis in athletes with scaphoid fractures and the need for early interventions.

Case Report
Patient: This JUCO football player is a 18-year-old (77.3 kg and 175.3 cm) athlete that presented with a scaphoid fracture during the season. The following information was obtained through interview, clinical injury, clinical assessments, radiographic findings, diagnosis, treatments and return to play to provide additional information to this athlete’s unique injury.

Mechanism of Injury: During the game, the athlete was tackled by an opponent and fell onto his outstretched hand. The athlete had an unusual mechanism of injury. He reported to the athletic trainer at the beginning of the season complaining of right wrist pain for approximately 1 year. The athlete denied a specific mechanism but stated that pain increased with hitting and blocking.

Diagnosis: The athlete initially was diagnosed with De Quervain’s tenosynovitis, due to the results of the clinical examination. He began conservative treatment in sport for 3 weeks with no relief. After 2-3 weeks, however, the athlete returned to the training room with a flare of pain, initial imaging using a fluoroscope showed no fracture. Fluoroscopy showed evidence of a scaphoid fracture, confirmed by X-ray and evaluation by team doctor. The athlete most likely had an old non-union fracture in the scaphoid, which had never healed. This new injury fractured the bone all the way through and displaced it. After consultation with the team doctor, it was decided that the athlete would undergo surgical repair of the scaphoid. During the surgery, necrosis was found, and the scaphoid bone was surgically revascularized using a graft from the radius.

Rehabilitation and Results
Fractures of the scaphoid bone can be managed conservatively and surgically, depending on severity of the injury. Extent of injury is determined based on how far the bone fragments have moved out of their normal position. Scaphoid fractures can be classified as displaced, where the bone fragments have moved out of their normal position (gaps may be present between the pieces of bone or fragments may overlap one another), or non-displaced, in which the bone fragments line up correctly. Conservative management may be recommended in cases where the fracture affects the distal pole of the scaphoid, is non-displaced, and does not show any signs of avascular necrosis. Common forms of conservative management involve cast immobilization for 8 to 12 weeks, followed by a gradual return to activity. However, conservative management can result in non-union in 5-25% of all cases and avascular necrosis in 13-30% of cases (Steinmann & Adams, 2000). Tenderness in the anatomical snuffbox and falling on an outstretched hand are thought to be the two cardinal signs of a scaphoid fracture, however, there are cases such as this one in which neither sign is present. This case is unique because the athlete presented with a non-classical mechanism of injury, none of the common signs of a scaphoid fracture, and, based on the athlete’s history, the scaphoid fracture had never healed. This new injury fractured the bone all the way through and displaced it. Following the initial imaging using the fluoroscope showed evidence of a scaphoid fracture. This was confirmed through X-rays and evaluation by team doctor.

Bone graft site

References

Discussion and Summary
Despite the high incidence of scaphoid fractures, they can be difficult to diagnose, leading to delayed treatment and complications such as non-union and avascular necrosis. Evidence has indicated that failure to recognize a scaphoid fracture can result in non-union in 5-25% of all cases and avascular necrosis in 13-30% of cases (Steinmann & Adams, 2000). Tenderness in the anatomical snuffbox and falling on an outstretched hand are thought to be the two cardinal signs of a scaphoid fracture, however, there are cases such as this one in which neither sign is present. This case is unique because the athlete presented with a non-classical mechanism of injury, none of the common signs of a scaphoid fracture, and, based on the athlete’s history, the scaphoid fracture had never healed. This new injury fractured the bone all the way through and displaced it. Following the initial imaging using the fluoroscope showed evidence of a scaphoid fracture. This was confirmed through X-rays and evaluation by team doctor. In the initial imaging using the fluoroscope showed evidence of a scaphoid fracture. This was confirmed through X-rays and evaluation by team doctor. The athlete was initially diagnosed with De Quervain’s tenosynovitis with athletic training staff with some relief after 2-3 weeks. However, the athlete returned to the training room a few weeks later after re-injuring his wrist and was re-evaluated. Fluoroscope showed evidence of a scaphoid fracture, confirmed by X-ray and evaluation by team doctor. The athlete most likely had an old non-union fracture in the scaphoid, which had never healed. This new injury fractured the bone all the way through and displaced it. After consultation with the team doctor, it was decided that the athlete would undergo surgical repair of the scaphoid. During the surgery, necrosis was found, and the scaphoid bone was surgically revascularized using a graft from the radius. This case highlights the unique diagnosis and surgical treatment of an athlete suffering from a scaphoid fracture. This further highlights the complications that can occur due to delayed diagnosis and treatment of scaphoid fractures. It also emphasizes the importance of early diagnosis in athletes with scaphoid fractures and the need for early interventions.