

## Abstract

**Background:** Athlete is a 20-year-old male, 190.5 cm and weighing 108.86 kg, NAIA football athlete. Athlete's prior medical history included scar tissue removal in the right elbow, right ACL surgery, and flexor tendon repair in the right hand. Athlete was participating in competition when he fell on an outstretched arm, athlete remained on the ground holding his right elbow. After being removed from the field the athlete was further evaluated by the team doctor. Palpation revealed he radial head seriously displaced. Relocation attempts with the Team Physician of the elbow were unsuccessful, causing extreme pain. The athlete was unable to perform forearm supination as well as pronation. Very limited elbow extension or flexion was performed. At the hospital, an x-ray and CT scan were both performed. This report is a Level 4: Rare Case Study Topic. **Differential Diagnosis:** Radial head fracture, lateral epicondyle fracture, annular ligament tear, elbow dislocation. **Treatment:** X-ray revealed that the radial head was fractured as well as displaced, athlete also dislocated the ulna. Athlete was given morphine in the hospital. Athlete was later splinted and released from the hospital. A later MRI revealed that the athlete has also received a slight tear in the brachioradialis muscle. Athlete was scheduled for surgery right away, a procedure that lasted four hours. Conservative rehabilitation began a few days following. Light active ROM focusing on extension and supination. We will continue to work and stretch the elbow joint. The athlete will focus on stretching muscles that attach at the elbow such as the biceps, triceps, flexor muscles, and extensor muscles. Athlete is currently wearing a splint at night to work on stretching the elbow back in to full extension. **Uniqueness:** Radial head fractures can be quite common when falling on an outstretched hand. About 20% of FOOSH (falling on an outstretched hand) injuries result in a fracture of the radial head, but more commonly in ages 30-40 years old. This athlete did in fact fall on an outstretched hand and completely shattered his radial head. Not only did the athlete fracture his radial head, he also dislocated his ulna. Immense forces are required to cause such an injury, as the elbow is a stronger and more stable joint. There are numerous surgeries to fix a radial head fracture, depending on the severity and displacement of the bone. This study aims to focus on those various forms of surgery. **Conclusion:** This case highlighted the unique surgical procedures and recovery from such an injury, a specialized operation that required eight screws and two plates. This study elaborates on the popular mechanism of FOOSH injuries and the many injuries that can result with it. This case highlighted the rehabilitation and recovery process from an elbow dislocation and radial head fracture, the complexities of treating athletes with related injuries.\_

## Introduction

Fractures of the radial head and/or neck often present with a FOOSH type injury mechanism. "A FOOSH injury is a well-known mechanism of falling on an outstretched hand, radial head fractures are very common with these types of injuries" (Sheehan, 2013). Even though radial head fractures are common with this mechanism of injury, having an associated ulnar dislocation as well as a muscle tear is very unique. The following information will explain the mechanism of injury, clinical assessments, radiographic findings, diagnosis, treatments and return to play to provide additional information to this athlete's unique injury.

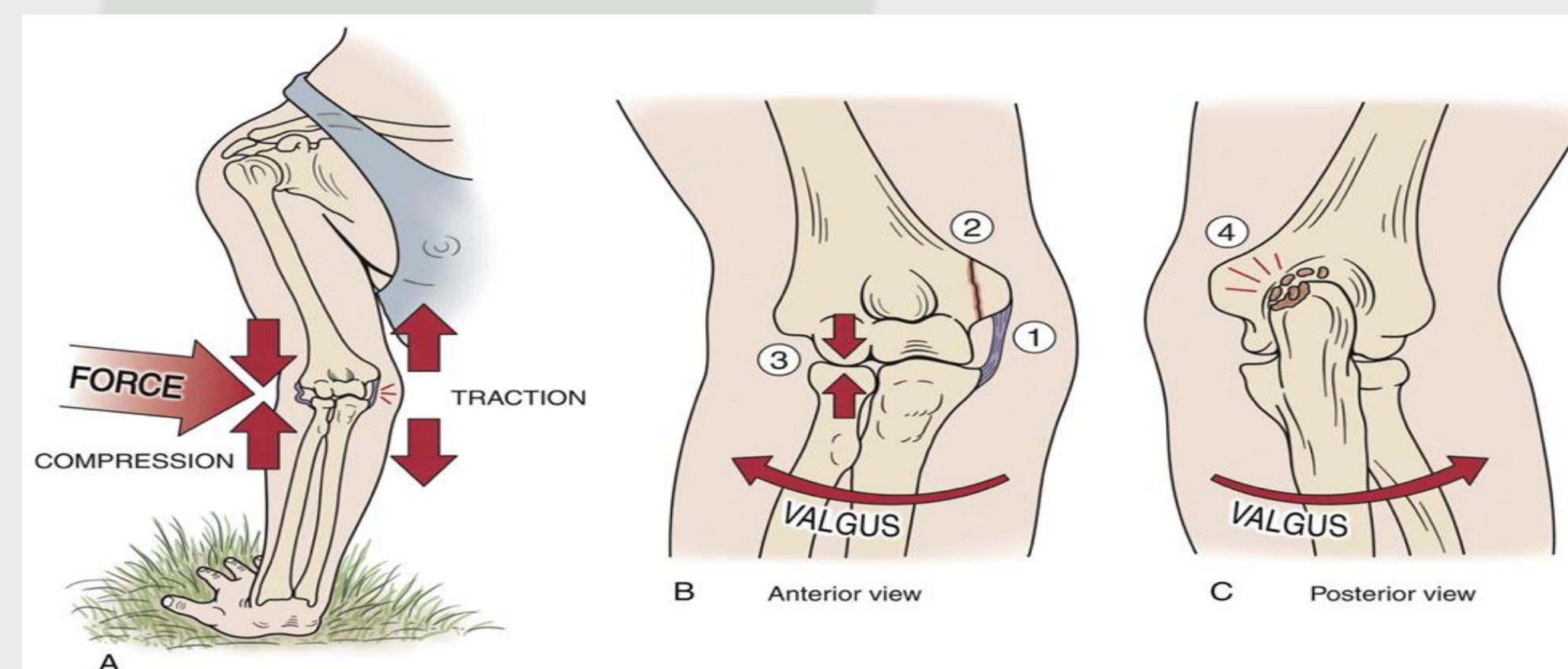
## Purpose

The purpose of this case report was to introduce a 20 year-old NAIA football athlete who suffered from a radial head fracture with an associated ulna dislocation and brachioradialis tear. Even though he experienced a complete rupture, he vetoed surgical procedures to avoid an even lengthier recovery process. An overview of this unique injury is presented to obtain additional information and a better understanding regarding the complete injury of a syndesmotank ankle sprain, from onset to return to play of a Division IA football player.

## Case Report

**Patient:** This NAIA football player is a 20-year-old (190.5 cm and weighing 108.86 kg) athlete that received a radial head fracture during the third play of the first quarter. The following information will explain the mechanism of injury, clinical assessments, radiographic findings, diagnosis, treatments and return to play to provide additional information to this athlete's unique injury.

**Mechanism of Injury:** Fractures of the radial head and/or neck often present with a FOOSH type injury mechanism. "About 35-50% of all elbow fractures are related to the radius (Sheehan, 2013). Many other injuries can arise with this mechanism of injury. Elbow dislocations are also very common after falling on an outstretched hand, particularly a posterior dislocation During the initial snap of the ball, the offensive linemen went to break through his defender when he was forcefully pushed to the ground. On instinct, the athlete stretched out his arm to brace himself from landing. The immediate contact from the ground traveled up the athlete's arm, causing his radial head to shatter. In addition, this forceful contact with the ground was enough to dislocate the proximal end of the ulna and cause a traumatic injury of the elbow.



**Clinical Examination:** Prior to the athlete being assisted off the field during the first quarter, an on the field assessment was performed. Upon arrival to the athlete, he was presented lying supine and favoring his right elbow. The assessment revealed extreme pain on his radial head and other surrounding structures of the elbow. Athlete was removed from the field and further evaluated on the sidelines by the team doctor. Palpation revealed that the radial head was seriously displaced. Relocation attempts of the elbow were unsuccessful, causing extreme pain to the athlete. During a range of motion assessment, the athlete was unable to perform forearm supination as well as pronation. Very limited elbow extension or flexion was performed. The athlete was immediately emitted to the hospital after the completion of the evaluation.

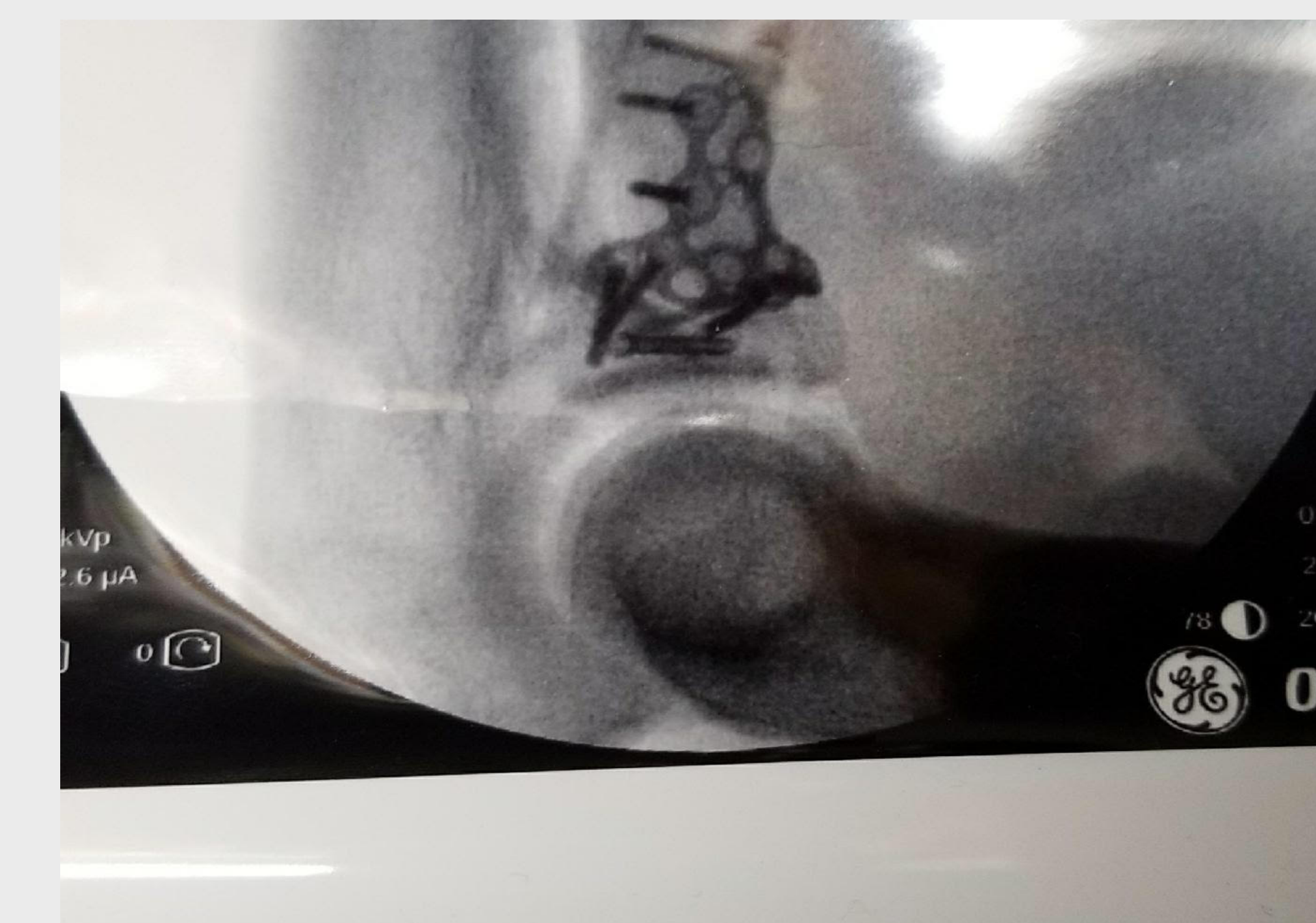
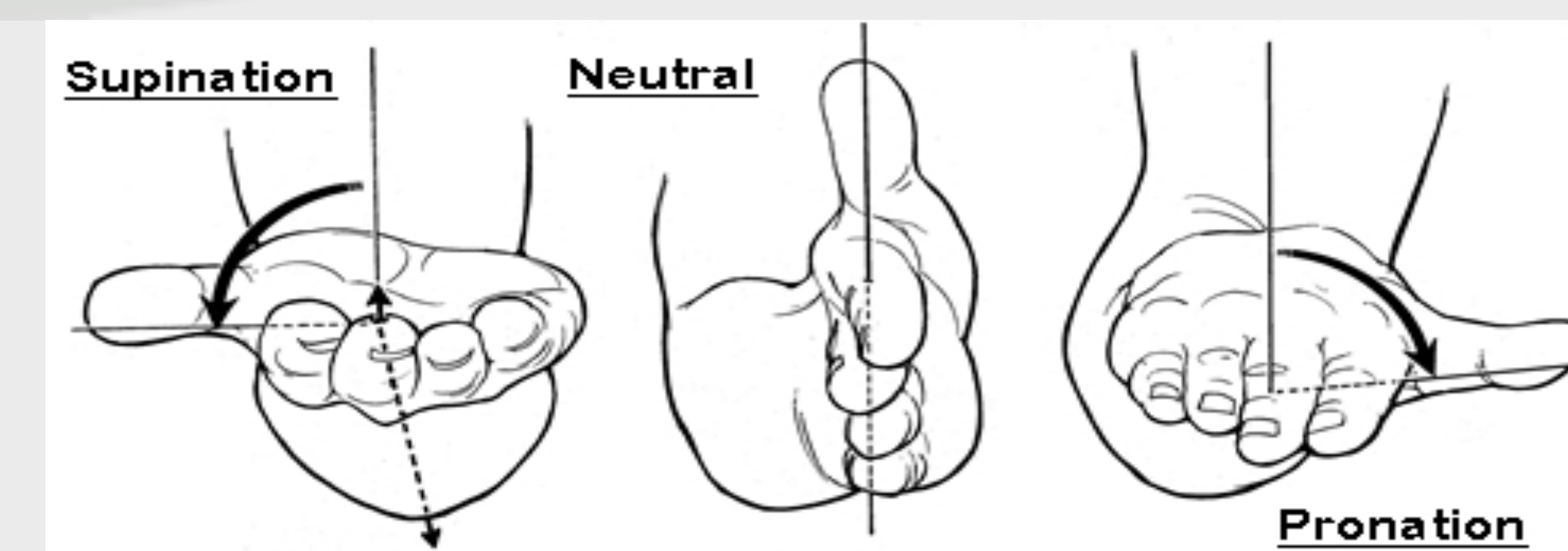


**Radiographic Findings:** The results of the x-rays showed that the right radial head had been displaced, fractured into five segments. The results of the x-ray also presented a posterior dislocation of the ulna. Additional MRI imaging indicated that the traumatic forces caused from the radius and ulna resulted in a partial tear of the brachioradialis muscle. The athlete was scheduled for surgery five days after the initial injury occurred.



## Rehabilitation and Results

After determining the classification of the injury, the choice of internal fixation was chosen for the surgical procedure. With internal fixation, the incision for the surgery is done from the posterior aspect of the elbow. "Once the fracture is located and opened, the final decision is made regarding whether to carry out fixation, replacement, or excision" (Rabin, 2017). The athlete underwent four hours of surgery where he received five screws in his radial head as well as 17 staples to close the open surgical wound. Following his surgical procedure, an extensive rehabilitation plan was created to begin improving range of motion. After a traumatic elbow injury, it is very likely that the patient or athlete will experience extreme stiffness of the elbow joint. A significant decrease in one's range of motion will also present with such an injury; the athlete should begin rehabilitation as soon as possible. "Physical therapy can be the difference between a functional extremity or a limb that suffers permanent functional loss" (MacDermid, 2012). Rehab began just a week after the procedure. Due to the extensive work that was done to the athlete's elbow, the first four weeks of rehab focused simply on active range of motion. The athlete focused on controlling his muscle contractions through each movement. Each session was slow and controlled, only having the athlete perform what he could without extreme pain. The first two motions to improve were supination and pronation. The original measurements, taken the first day of rehab, measured 23 degrees of supination and 19 degrees of pronation. Active assisted exercises were also done to help the athlete improve his range of motion. Working four times a week, an hour each session, the athlete began improving as time progressed. After the fourth week of rehabilitation the athlete had improved to 43 degrees of supination and 41 degrees of pronation. Due to a change in my clinical site rotation I was unable to continue working with this athlete. Other members of the sports medicine team were able to continue out his following rehabilitation plan. Monthly check-ups with the athlete let me know that he is still progressing well and improving his elbow range of motion.



## Discussion and Summary

FOOSH injuries are very common throughout all sports. A common injury that results from a FOOSH mechanism are radial head fractures. Radial head fractures have multiple classifications based on the severity of the injury. "These classifications are commonly referenced in the Mason- Johnston system, the Mason system looks at the pattern of each injury and the location of the fracture site" (Iannuzzi, 2012). It is important to classify these fractures and their severity when determining surgical options and individualized treatment plans. Physical examinations that include proper palpation, special tests, and clinical findings are imperative in a correct diagnosis. Once a diagnosis is hypothesized, radiographic findings may be necessary for some patients depending on severity and confidence of the diagnosed injury.

Surgical treatment is followed and performed through open reduction with internal fixation. An extensive rehabilitation plan is created between the physical therapist and sports medicine team. What makes this case study so unique is the triad of injuries that occurred together. Radial head displacement is a common injury that can happen after falling on an outstretched hand, dislocating one's elbow can also occur. A very rare injury to occur, especially from this mechanism, is tearing one's brachioradialis muscle.

## References

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