4th Metacarpal Fracture in Collegiate Athlete: Level 3 Case Study  
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Background: An athlete suffers a 4th metacarpal fracture while defending an opponent during a game. In most instances, the cause of these fractures is due to a direct axial or compressive force. Initial treatment of a suspected fracture or known fracture should be rest, ice, compression, and elevation, and it is crucial that an appropriate splint or cast is applied correctly until proper healing has occurred. Most metacarpal injuries are managed by closed reduction and immobilization or sometimes controlled mobilization utilizing a dorsal block splint. Depending on the specific place and the severity of the fracture will determine whether or not the athlete needs surgery to repair the fracture. Possible suspected injuries were a 5th metacarpal fracture, digiti minimi fracture, and a boxer's fracture. Athlete's pain and tuning fork results all directed to a 5th metacarpal fracture. The athlete's mechanism did not point to a 5th metacarpal fracture but the initial signs, symptoms and tuning fork results directed the initial conclusion of the 5th metacarpal fracture.

Case Presentation:

a. The athlete is a 20 year-old female lacrosse player. Her hand was in a closed fist and heard a crack while making contact with an opponent and felt immediate pain in her hand. Initially, ice was applied to the athletes hand and a splint immobilizing the wrist, hand, and 2nd – 5th fingers was given to athlete. A tuning fork was used to detect a fracture and was initially positive for pain on the 5th metacarpal. Athlete's range of motion was not tested due to pain.

b. A secondary evaluation was done after athlete still showed pain on the 5th metacarpal. X-rays were taken at Kean University and showed oblique fracture of the 4th metacarpal and was sent to the doctors for another x-ray and further evaluation. Doctor assessed a 4th metacarpal fracture and indicated that no surgery was required. Edema and ecchymosis was clearly visible on the palmar aspect of the 4th metacarpal and 4th finger was also slightly crooked compared to the non-affected hand. After a fracture occurs the signs and symptoms may include, pain, swelling, rotational malalignment, shortening, and overriding. A splint immobilizing the 3rd-5th fingers, wrist, and hand was appointed to the athlete. Range of motion was limited but slight finger flexion and extension was possible. Athlete's ulnar deviation was within normal limits but completed with pain.

c. When comparing the treatment with the research, the athlete was treated with reduction and then placed into an immobilizing splint. Athlete was in a fibro-glass splint for a month and in an ortho-plast brace for 5 weeks.

Conclusion: Fractures of the metacarpal and phalanges constitute 10% of all fractures. Athlete’s clenched fist and closeness with an opponent exposed the metacarpals to be available for trauma. All of the athlete’s pain, along with signs and symptoms all directed an initial evaluation to a 5th metacarpal or 5th digit fracture. Severity of the injury forced further diagnostic testing. The outcome of her injury ended up as a 4th metacarpal fracture. Throughout the duration of an athlete’s injury, it is important to get a further testing and evaluations to make sure the athlete gets proper care.

Clinical Bottom Line: Clinically, it is important to follow up every injury. What may look like a “by the book injury” can turn out to be completely different even with the same type of mechanisms.

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