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Elbow dislocation with coronoid and ipsilateral distal radius fracture

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Abstract

Introduction: The elbow joint is one of the most stable articulation of the human skeletal system, which makes dislocations of the elbow already an uncommon entity. Add to that, a dislocation associated with coronoid fracture along with a distal end radius fracture, it makes up for an extremely rare entity to occur in a patient.

Case Report: We report a case of a 27-year-old male who had a posterior elbow dislocation with ipsilateral coronoid fracture and distal end radius fracture. The elbow was relocated in extension and the distal end radius was attempted to be reduced in flexion. The patient underwent coronoid process fixation with the help of an anchor suture and the distal end radius was fixed with K wires. At 6 months follow up, the patient had minimal pain in his elbow and wrist and could do his daily routine work.

Keywords: Elbow dislocation, coronoid process, distal end radius, fracture

Introduction

Elbow joint is a hinged variety of synovial joint which is one of the stable articulations of the human skeleton due to its capsuloligamentous stabilizing network. When one of its osseous or articular component structure is disrupted, the stability of the elbow joint is altered leading to recurrent or chronic instability. Traumatic elbow injuries, those associated with a dislocation, leads to elbow instability by damaging both bony structures as well as the soft tissues. The coronoid process of the ulna is one of the bony structures that can be fractured and has an important role in the stability of elbows after dislocation. These fractures are relatively uncommon which occur in approximately 2% to 15% of population with dislocation. Coronoid fracture often occurs in the injury termed as “terrible triad of the elbow, which involves a posterior or posterolateral dislocation of the elbow, fracture of radial head, as well as a fracture of coronoid process of ulna. Also, Proximal radius or ulna fracture is usually associated with fracture dislocations of the elbow joint.

Elbow dislocation and distal end radius both are FOOSH injuries. They can occur singularly, but them occurring together is rare, albeit, not impossible. Very few instances of elbow dislocation with ipsilateral distal radius fracture have been reported in the past literature. We present a rare combination of elbow dislocation with coronoid fracture with ipsilateral distal end radius fracture and discuss the possible mechanisms of injury and its management issues.

Case Report

A 27-year-old male presented to our emergency department after falling from his bike and landing on his outstretched left hand. He complained of severe pain over left elbow joint and wrist joint with the intensity of 9/10 on NPRS. The pain was sudden in onset, non-radiating and aggravating in nature which aggravated on attempting any elbow or wrist movement. No history of loss of consciousness, ENT bleed, head injury was present. No associated pelvic, abdominal or spinal trauma was present. On physical examination, left elbow was grossly deformed and swelling was present over the left wrist joint. Tenderness of grade 3 was present over both wrist and elbow joint. Range of motion of left elbow and left wrist joint were both painful and were not assessed. There was no distal neurovascular deficit. Plain radiographs confirmed posterior elbow dislocation with ipsilateral coronoid fracture and distal end radius fracture. Closed reduction of the dislocated elbow joint was immediately performed with elbow in extension under sedation. The patient underwent coronoid process fixation with the help of an anchor suture and the distal end radius was fixed with K wires.

An above-elbow slab was applied for 6 weeks. Active assisted Shoulder and active finger ROM rehab was started immediately after the surgery. Active elbow and wrist movements were started after 6 weeks. At 6 months follow-up, patient has regained full flexion and extension of elbow and wrist joint and full pronation and supination of forearm. He has resumed his occupation as an IT professional.

Pre-Operative Images



Fig 1: Pre-Operative X-Ray Showing Postero-Lateral Elbow Dislocation



Fig 2: Post-Reduction X-Ray Showing Relocation of the Elbow and Coronoid Fracture



Fig 3: X-Ray of the Wrist Showing a Distal End Radius Fracture

Post-Operative Images



Fig 4: Post-Operative X-Ray Showing Coronoid Fracture Fixed With Anchor Suture



Fig 5: Post-Operative X-Ray Showing Distal End Radius Fixed With K-Wire

Discussion

Elbow dislocation is often associated with destruction to its surrounding soft tissues, such as the ligamentous structures around the elbow joint, and fracture of the bony structures like the radial head, coronoid process, and olecranon process ^[1]. High-energy injuries such as traffic accidents and fall from a height, may lead to ipsilateral wrist and shoulder injuries ^[2]. There are only few cases of elbow dislocation with ipsilateral distal radius fracture been reported in the literature previously. Earlier reported cases consisted of young adults who fell on their outstretched hands after falling from a height or falling on their bikes while bicycle riding. In elderly, patients fell on their outstretched hands after falling from a chair height as per literature. Elbow Dislocations are usually associated with Coronoid fractures. Elbow dislocation is described by Morrey and An as “usually a high energy episode with severe soft tissue injury,” many occurring during sports, daily activities or at work. Major traumatic incidents such as motor vehicle accidents can also cause these types of injuries. The most common cause of an elbow dislocation is a fall on the elbow or outstretched hand from standing height or higher ^[3]. In our case, this combined injury involving posterior dislocation of elbow with coronoid fracture with ipsilateral distal end radius fracture was due to fall on an outstretched hand caused by high velocity motor vehicle accident.

Most probable mechanism to produce this type of injury would be due to direct contact of wrist with the ground leading to distal end radius fracture ^[4]. In this case, the rebound forces from the ground were dorsal to the radius as the fracture was dorsally angulated. This dorsal force would hyperextend the elbow causing posteromedial dislocation ^[5]. When the elbow is axially loaded in extension, force is concentrated on the articular surface of the coronoid process. During dislocation, the trochlea can axially load the coronoid process leading to a shear fracture during terminal extension. There may also be an avulsed component with the capsule pulling off the tip of the coronoid process of ulna.

Conclusion

We recommend that in every case of elbow dislocation, wrist joints be assessed clinically as well as radiologically for any associated injury. A high index of suspicion of distal radius fracture should be kept in every patient of elbow dislocation. In our experience, elbow dislocation should be first reduced in extension and then only should one proceed with reduction of distal radius fracture in flexion.

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Conflict of Interest: None declared

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