

## Diagnosis and Management of Radius Fracture: Case Study

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### Case Presentation

A 20-year-old woman visited to the clinic in the university with a severe pain in the left hand and wrist. The patient slipped down by herself, and hit hip and palms with fully extension on an ice during ice-skating. She had severe pain and mild swelling in the hand and wrist of her left limb with difficulty in moving fingers and wrist. During the physical examination by orthopedic doctor, there was tenderness in the palm, the wrist and the distal part of the radius with palpation, but not tingling. The injured hand was not able to close (flex) because of the increase in severe pain. No fracture line and dislocation in injured palm, wrist, ulnar and radius on radiography (X-ray). Ultrasonography (US) procedures were utilized to rule out deep tissue. US revealed a shadow part in the radius. Magnetic resonance image (MRI) demonstrated many small fracture lines of the distal part of the radius (figure 1). The patient was treated with the conservative methods of resting, cold pad, plastic splint, compression and sling (triangle bandage) [1,2]. X-ray has been used as the primary imaging technique for accurate evaluation and localization of patient with the suspected fracture. MRI has been used as imaging modality for soft tissue damage such as tendinous and ligamentous. MRI, recently, has become imaging modality choice for identifying occult fractures which are missed on X-ray [3,4].

Fall during sports activity and/or daily living is possible to cause fracture in upper extremity. Although injuries to the upper extremity are most costly, the picture of the upper extremity injury problem remains incomplete [5]. Ice skating, is a most popular winter sports, related fractures have been reported as high as 82.8% of all sports-related fractures [2]. The most common fractures in ice skating in adults have involved upper (80%) and lower extremity injuries (11%). Majority of the upper injuries has been distal radius fracture [6]. Another sports-related fracture in upper extremity is soccer. Soccer, is popular sports in the world, related injuries which were 35% upper extremity and 53% lower extremity injuries were recorded [7]. Fractures were more frequently diagnosed in the upper than in the lower extremities (44% and 14%, respectively), especially in children. Falling was the main cause of upper extremity injury [7]. Andersson et al. [8] presented the relationship between injury incident and layoff time. Injuries to the hand, upper extremity constituted less than 1% of all time-loss injuries in male professional soccer players. However, fractures are the most injuries that occur in the upper extremity such as hand (54.1%), wrist (60.0%), and forearm (85.7%). In addition, the layoff time for injured soccer players with upper extremity were hand ( $16 \pm 27$  days), wrist ( $15 \pm 18$  days) and forearm ( $45 \pm 8$  days). Therefore, although the rate of injury in the upper limbs is low, when an injury occurs, the fracture is severe and the period of layoff time is long. The last study presents that children injured upper extremity during physical activity. The upper extremity injuries, 55% were sprain, 47% occurred in the hand/wrist, and 53% of cases were caused by a fall [5].

Since the fracture due to X-ray could not be confirmed, it was diagnosed as sprain or bruise, and it is possible to return to practice or the game early by fixing with splint and bandage. Therefore, another fall may result in a more severe fracture. In that case, fixing

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the plate by surgery increases the physical and mental stress and financial burden. Distal radius fractures in adults are among the most common fractures encountered by orthopedic surgeons. Treatment options vary depending on injury severity and stability of the fracture reduction. Common surgeries include pinning with and without external fixation. Dorsal plating with low profile plates and fragment-specific techniques, also, can be successful in treating distal radius fractures [9].



Figure 1. MRI image of the injured radius bone with small fracture lines (above the star) in the left wrist.

However, it is necessary to make a decision of surgical treatment with the consideration of bone growth and development, if the patient is a growing child.

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## Conclusions

Fall is the cause of fracture in the upper extremity. The risk factors should be taken into account when diagnosing and managing injuries in the upper extremity.

## Learning Points

- Fracture of the distal part of the radius without the dislocation is seen regularly in fall down in soccer and ice-skating.
- MRI have been used as the primary imaging modality for evaluation of patients with the acute injury.

## Competing Interests

The author declares that he has no competing interest.

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