

IN BRIEF:

Topics in Pediatric Orthopedics

Treating Distal Radius Fractures

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Pediatric orthopedic surgeon

Distal radius fractures are some of the most common fractures in the pediatric population. They constitute 20 to 35 percent of all childhood fractures and about 80 percent of pediatric forearm fractures. Approximately one-third of distal radius fractures involve the physis; the remaining fractures are mainly metaphyseal.

The most common fracture mechanism is that the child falls on an outstretched arm while the wrist is extended, and that leads to dorsal displacement of the distal fragment. Conversely, if the wrist is flexed at the time of injury, the result may be volar displacement of the distal fragment.

The distal radius and ulnar physes contribute about 80 percent of longitudinal growth of the forearm. Consequently, distal radius fractures have excellent healing and remodeling potential—significantly better than that of more proximal forearm fractures.

Diagnosis

Diagnosis is made by AP and lateral radiographs of the wrist or forearm.

Treatment

When treating a distal radius fracture, the goal is to achieve a normal range of motion and alignment, including wrist flexion and extension and forearm pronation and supination. The final alignment will be achieved as the radius continues to remodel and grow after the fracture has healed. In children younger than 10, up to 15 degrees of angulation and 30 percent displacement are acceptable and can result in excellent remodeling. In children older than 10, up to 10 degrees of angulation is acceptable. For younger children, studies have shown that even bayonet apposition and shortening without fracture reduction can result in overall good healing, remodeling, final range of motion and alignment.

Fractures that show angulation or displacement beyond the parameters above can typically be treated with closed reduction and cast/splint immobilization. Occasionally, fractures that are unstable after reduction, or that prove to be unstable and lose alignment while casted, will require surgical fixation, most commonly with percutaneous pinning.

Distal radius fractures are typically treated with four to eight weeks of cast immobilization. Distal radius buckle fractures, which have good inherent stability, can often be treated in short arm casts or splints for a total of four weeks. Fractures that require reduction are initially placed in a long arm cast or sugar tong splint to avoid displacement with elbow range of motion or forearm supination/pronation. Patients then wear a short arm cast until healing is sufficient.

Distal radius fractures that involve the physis have a risk of permanent physal damage, which could result in growth arrest. The likelihood increases with higher energy of injury. The fracture should be monitored long-term after it has healed to ensure symmetric growth of the radius and ulna. If premature physal closure occurs, it should be managed expediently to prevent long-term deformity at the wrist.



Alison Schiffern, M.D., is a board-certified pediatric orthopedic surgeon who focuses on treating conditions including fractures, limb deformity, developmental dysplasia of the hip, clubfoot, and other bone and soft tissue conditions. She also treats patients who have a spectrum of neuromuscular disorders.

She received her medical degree from the University of Utah School of Medicine in Salt Lake City, where she also completed an internship and residency in orthopedic surgery and a fellowship in pediatric orthopedic surgery. Her recent research activities have focused on developmental dysplasia of the hip. She has coauthored several journal articles and presented posters and lectures on a variety of orthopedic topics. She is also interested in outreach activities for underserved communities and countries. She is a member of the American Academy of Orthopaedic Surgeons and the Pediatric Orthopaedic Society of North America.

Key Insights

- Distal radius fractures constitute 20 to 35 percent of all childhood fractures.
- The most common fracture mechanism is that the child falls on an outstretched arm.
- Because of expected growth, distal radius fractures have excellent healing and remodeling potential—significantly better than that of more proximal forearm fractures.
- Typically, distal radius fractures can be treated with closed reduction and cast/splint immobilization for four to eight weeks. Occasionally, fractures that are unstable after reduction, or that prove to be unstable and lose alignment while casted, will require surgical fixation, most commonly with percutaneous pinning.

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About *InBrief*

InBrief has been developed by pediatric orthopedic specialists at Gillette Children's Specialty Healthcare as a resource for primary care providers. If you have comments or questions, please contact Paul Fiore, M.B.A., F.A.C.H.E., program manager, Center for Pediatric Orthopedics, at pfiore@gillettechildrens.com.



*Left image:
AP view of the wrist
at time of injury shows
displacement through
the physis*

*Right image:
AP view of the wrist
after reduction*



*Left image:
Lateral view of the wrist
at time of injury shows
dorsal displacement of
the epiphysis*

*Right image:
Lateral view of the wrist
after reduction shows
that the epiphysis and
metaphysis are well
aligned*