



Distal Radius Fracture

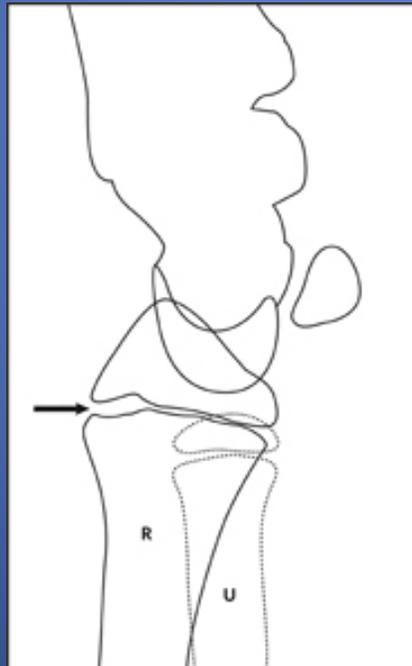
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Baramati-Last Saturday of every month

Distal radius fracture

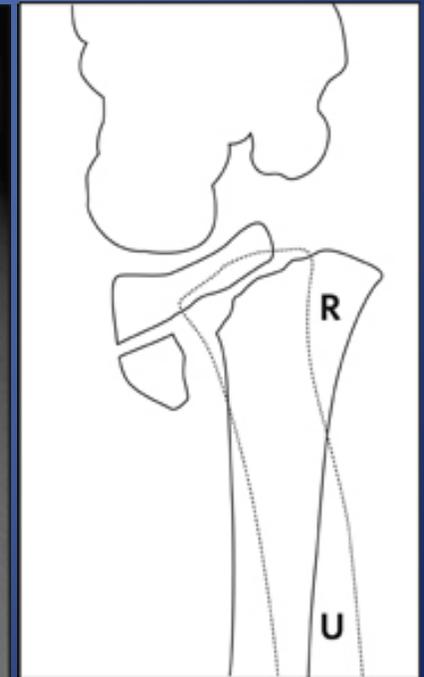
- Physeal injury
- Incomplete fracture
- Complete fracture
- Paediatric galeazzi fracture

Physeal injuries

Salter Harris Type 1



Salter Harris Type 2



Salter Harris Type 1 Treatment options

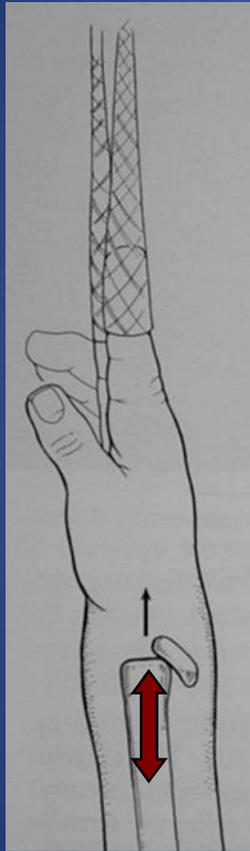
- Closed reduction
- Closed reduction and K wire
- Open reduction

Displaced Distal Radius Physeal Fractures-Treatment

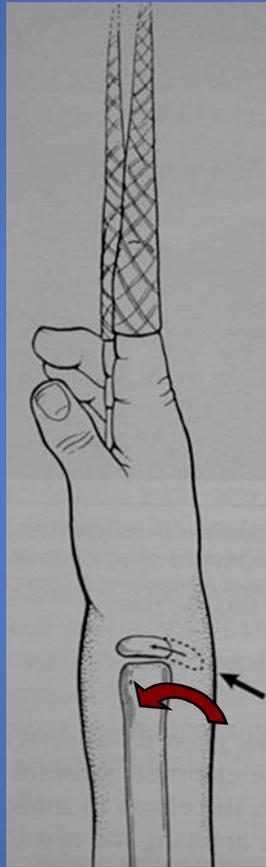
- Closed reduction usually not difficult
 - Traction with finger traps (reduce shear)
 - Gentle dorsal push
- Immobilize
 - Well molded cast / splint above or below elbow
 - 3-4 weeks immobilization



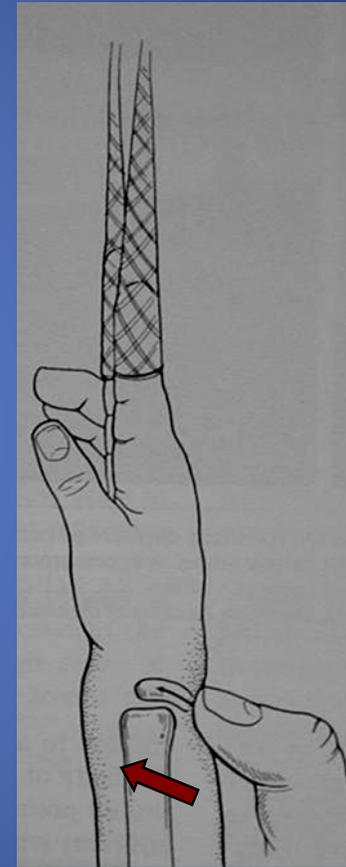
Physeal Injury Reduction Maneuver



Use finger trap for traction



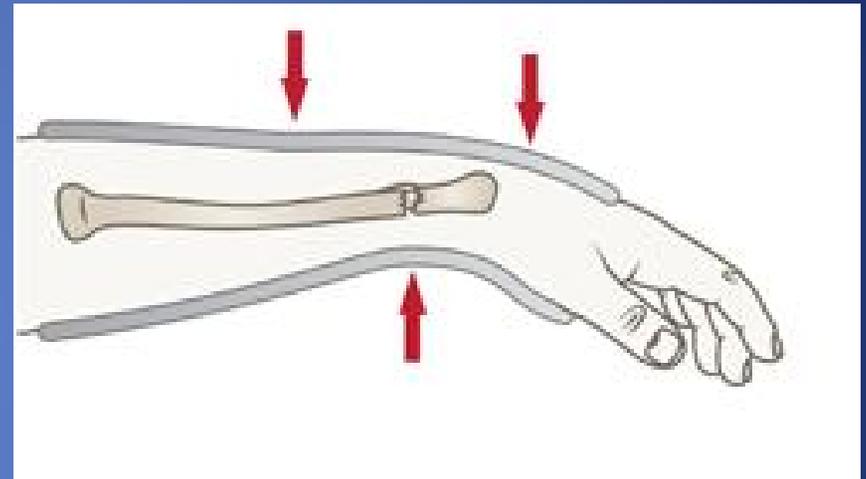
Majority of correction achieved with traction



Gentle push to complete reduction

Closed reduction

- 3 point molding with slight wrist flexion
- Close followup is required because of risk of displacement
- **Delayed presentation**
> 5 days- don't reduce



Salter harris type 2: Closed reduction

- Distraction and flexion of distal epiphysis, carpus and hand over proximal metaphysis
- Intact dorsal periosteum is used as tension band to aid in reduction and stabilization.

Closed reduction and K wire

- Severely displaced physeal fractures
- Neurovascular compromise
- Volar soft tissue swelling

Technique

- Smooth pin
- 1.8mm K wire
- Hand drill

SH Type 2

Pre operative



Post operative



Open reduction and fixation

- Irreducible fracture due to entrapped periosteum or pronator quadratus
- Open fractures
- SH type 3,4
- Triplane equivalent fracture
- Surgical Approach - Volar

Complications

- Malunion
- Physeal arrest
- Ulnocarpal impaction syndrome
- TFCC tears
- Neuropathy

Metaphyseal fractures

- Torus
- Incomplete or greenstick
- Complete fractures- with or without ulna fracture

Torus fracture

- Axial compression injuries
- Junction of metaphysis and diaphysis
- Stable fractures because of intact periosteum
- Treatment- splint/ cast



Incomplete/greenstick fractures

- Controversy exists regarding position of cast
- **Apex volar** fractures represent supination deformity hence according to some cast must be in **pronation**
- **Apex dorsal** fractures are malrotated in pronation hence cast must be in **supination**
- Above elbow/below elbow

Apex volar-plaster in pronation



Remodeling Potential Variables to Consider

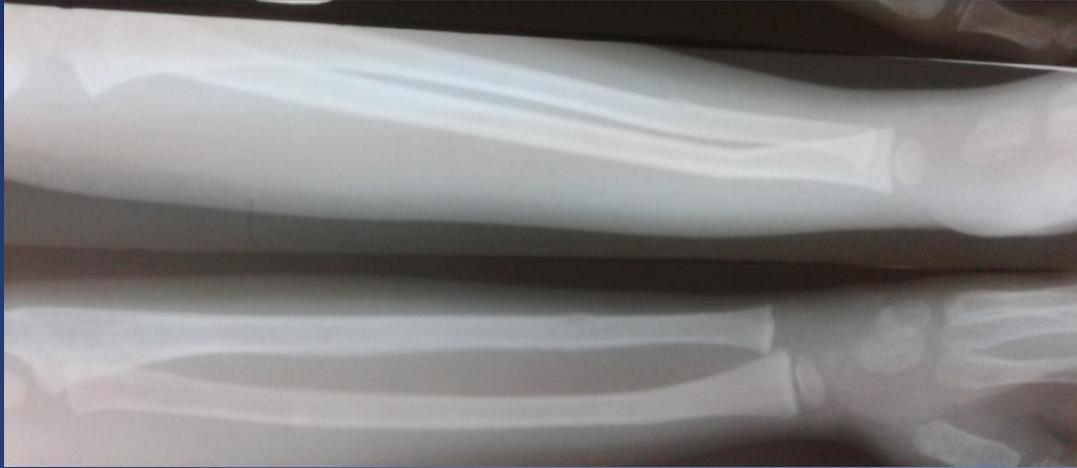
- Age of child
- Distance from fracture to physis
 - Distal metaphyseal fractures most forgiving
 - Proximal forearm fractures: much less remodeling
- Angular deformities:
 - Physeal growth: correction of 0.8 - 1 degree per month, or ~10 degrees per year
- Rotational deformities will not remodel

Acceptable angular correction

AGE	SAGITTAL PLANE	FRONTAL PLANE
4-9	15-20	15
9-11	10-15	5
11-13	10	0
>13	0-5	0

Green stick fracture-radius

Pre operative



Post operative



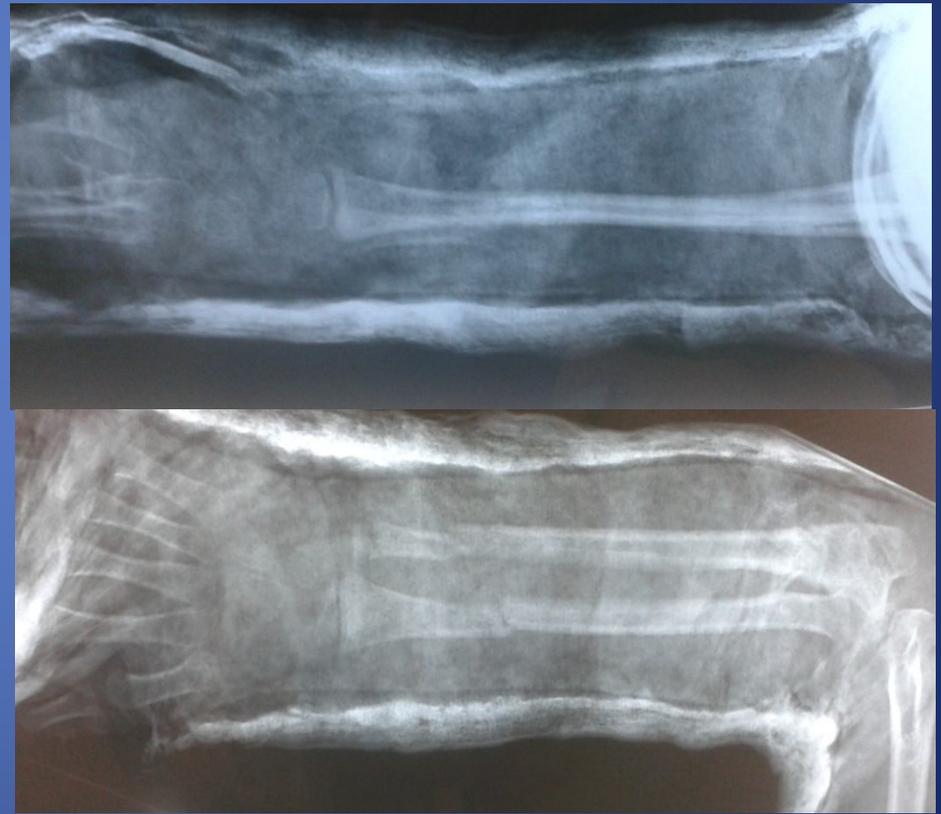


Radius and ulna

Pre operative



Post operative



Risk factors for loss of reduction

- Poor casting
- Bayoner apposition
- **Translation greater than 50% of diameter of radius**
- Apex volar angulation greater than 30 deg
- Isolated radius fractures
- Radial and ulnar metaphyseal fractures at same level

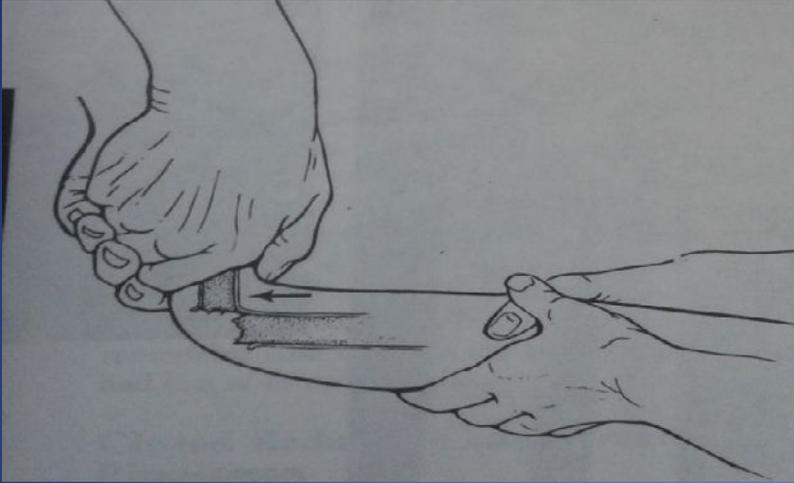
Distal end Radius fracture

Clinical



Reduction and fixation

Hyper dorsiflexion maneuver



Bayonet apposition



Reduction technique

Distraction



Joystick



K wire



Compound fracture

X ray



Clinical

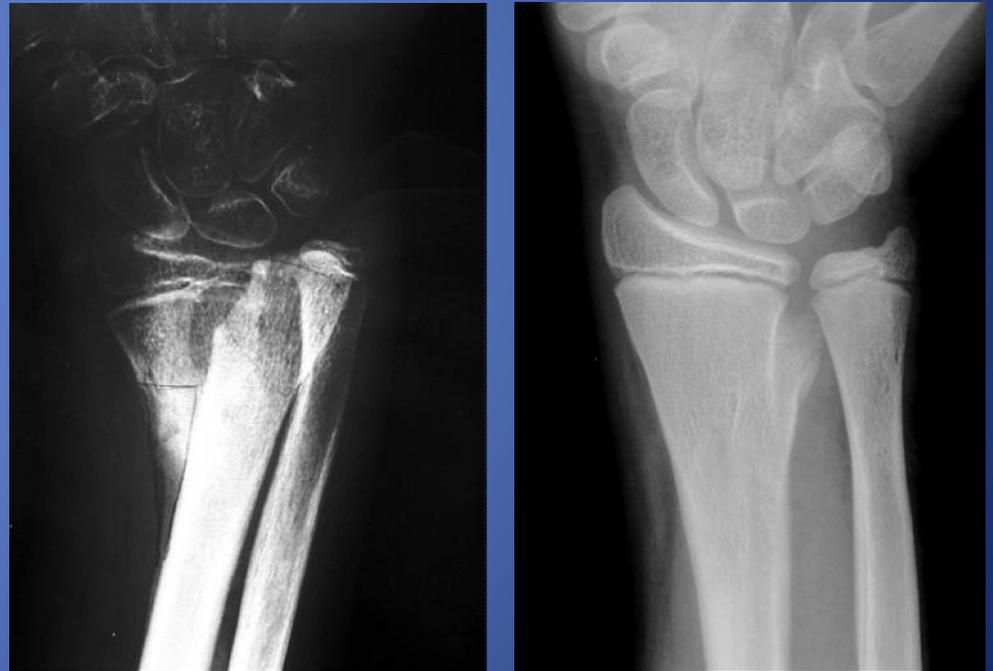


K wire fixation



Distal Radius Fractures – Potential Complications

- Growth arrest
 - Around 4-5%
- Malunion
 - Will typically remodel
 - Follow for one year prior to any corrective osteotomy
- Shortening
 - Usually not a problem
 - Resolves with growth



Remodeling at 2 years

Growth Arrest following Distal Radius Fracture



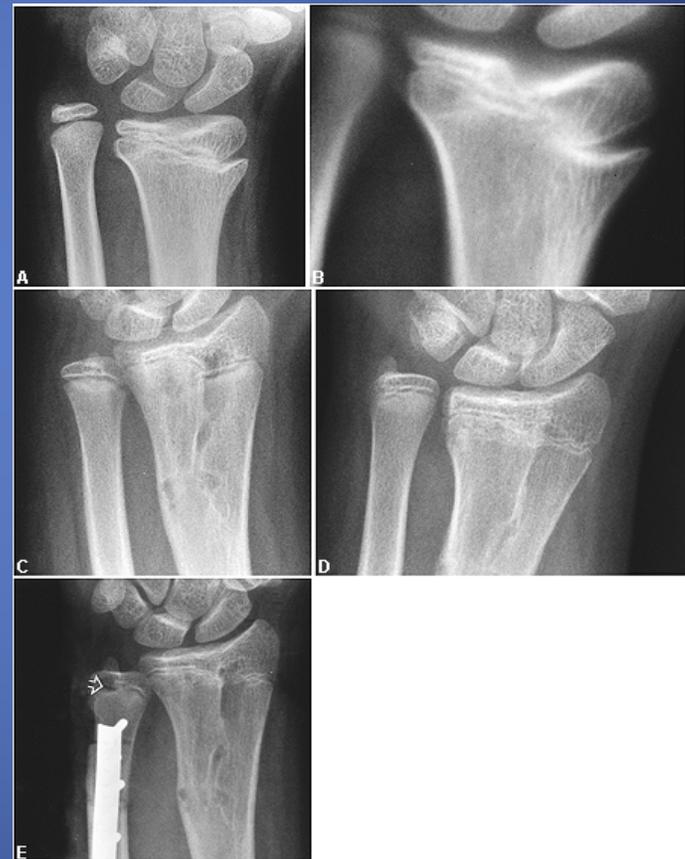
Injury films



Injured and uninjured wrists
after premature physal closure

Distal Radius Growth Arrest

- Relatively rare (approx 4%)
- Related To:
 - Severity of trauma
 - Amount of displacement
 - Repeated attempts at reduction
 - Re-manipulation or late manipulation



Complication

Pre operative



Intra-op



After plaster removal



Clinical (at 9 mth)



9 months followup



Remodeling Potential - 12 yo Male



←
Presented 10 days after fracture – no reduction, splinted in ED and now with early healing – no additional reduction

→
At 6 months – extensive remodeling of deformity noted



Malunited distal end radius



Fixation



Combined injury



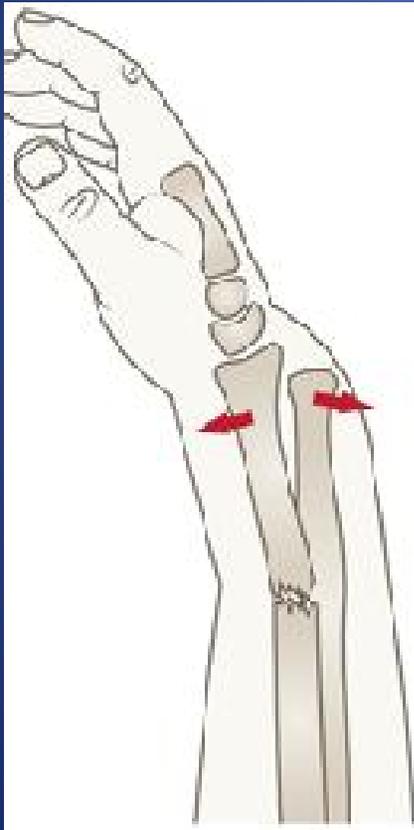
Pediatric Galeazzi fracture

- These fractures are often missed and may be difficult to recognise.
- If there is an isolated radius fracture, always examine the DRUJ on x-ray

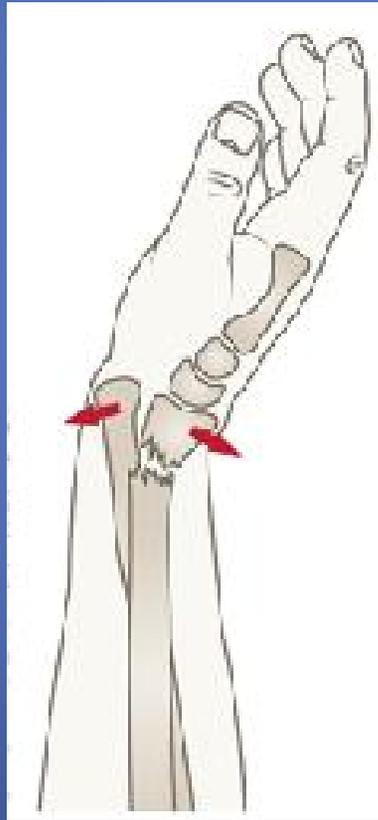
Galeazzi Injury Complex

Fracture of distal radius associated with DRUJ disruption

Dorsal

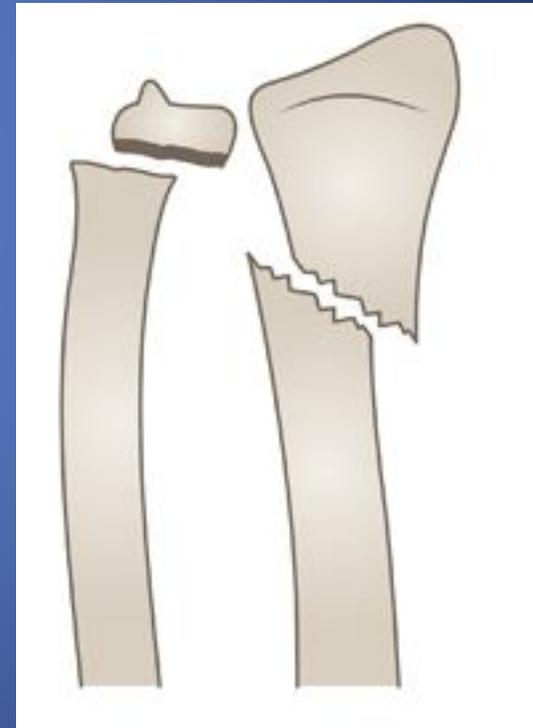


Volar



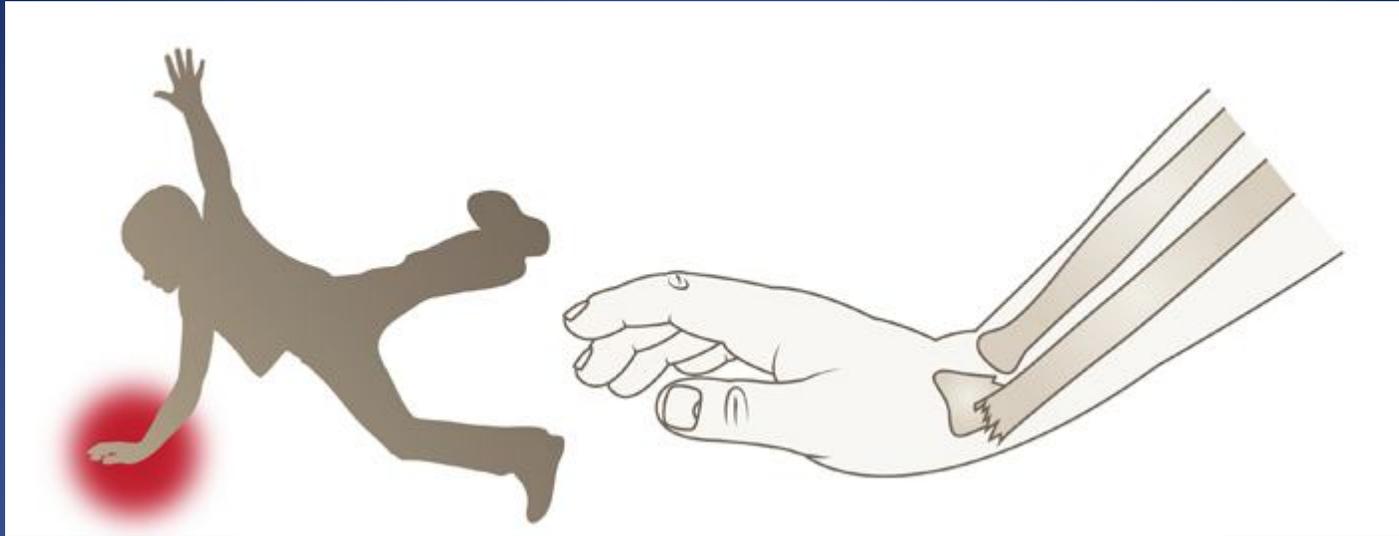
Fracture of distal radius with distal ulnar physal fracture

Equivalent



Treatment

- Most of these fractures can be managed with closed reduction. Fluoroscopy should be used to assess stability of the DRUJ after reduction.
- Adolescents are more likely to need open or percutaneous fixation to stabilise the DRUJ after reduction.
- Risk of ulna growth arrest (50%) in Galeazzi equivalent



Thank you