

# Distal Ulna Physeal Arrest Following Distal Forearm Fractures in Children

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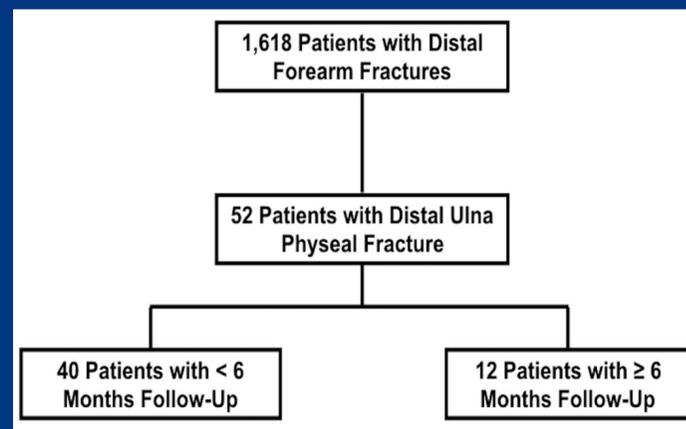
## OBJECTIVES

The incidence and long-term complications of pediatric forearm fractures involving the distal ulna physis remains largely unknown. Distal ulnar physeal arrest can lead to the development of radioulnar length discrepancy and angular deformities. Two previous studies of limited sample size report a 50-55% of physeal arrest when the ulnar physis was involved in the fracture, which seems higher than what is seen at our institution.

The purpose of this study was to investigate the demographic distribution, as well as the incidence of physeal arrest following a physeal fracture of the distal ulna.

## METHODS

- Retrospective study performed of all patients < 18 years of age at our level-1 emergency department or orthopaedic department from Jan 2003 to December 2017
- Excluded those with extra-physeal fracture and closed physis
- Examined 1,618 radiographs with distal forearm fractures, 52 patients had distal ulna physeal fracture
- Recorded patient demographics, mechanism of injury, age at follow up
- Categorized the physeal fracture using the Salter-Harris classification system
- Reviewed all radiographs > 6 months post-injury to assess for physeal arrest



## RESULTS

- There were 12 patients with at < 6 months follow up post injury (average follow up time 2.4 ± 2.2 years)
- No patient had ulnar physeal arrest



Time of Injury

One patient developed distal radius physeal arrest and had wrist pain 2 years after injury

2 Year Follow-Up

## Injury Failure Revision



One patient had a Galeazzi fracture and went on to develop a malunion with clicking of the wrist despite being treated with ORIF and required a revision osteotomy 7 months later

Demographic Variable	≥ 6 Month Follow-up (N = 12)	< 6 Month Follow-up (N = 40)	p-values*
Age at Injury (years)	10 ± 3	11 ± 4	0.137
Gender			1.000
Males	6 (50%)	20 (50%)	
Females	6 (50%)	20 (50%)	
Height (m)	1.5 ± 0.2	1.4 ± 0.3	0.505
Weight (kg)	52 ± 26	49 ± 19	0.849
Body Mass Index	23 ± 6	24 ± 5	0.609

Classification & Associated Forearm Fracture	≥ 6 Month Follow-up (N = 12)	< 6 Month Follow-up (N = 40)	p-values
<b>Distal Ulna Salter-Harris</b>			0.265
I	1 (8%)	1 (2%)	
II	6 (50%)	23 (58%)	
III	5 (42%)	10 (25%)	
IV	0 (0%)	6 (15%)	
<b>Distal Radius Salter-Harris</b>			0.387
I	1 (33%)	1 (5%)	
II	2 (67%)	16 (90%)	
III	0 (0%)	1 (5%)	
IV	0 (0%)	0 (0%)	
<b>Associated Metaphyseal Radius Fracture</b>	6 (50%)	21 (53%)	1.000

Mechanism	≥ 6 Month Follow-up (N = 12)	< 6 Month Follow-up (N = 40)	p-values
Fall on Hand	7 (58%)	23 (58%)	1.000
High Energy Accident	2 (17%)	9 (22%)	1.000
Fall from Height	1 (8%)	5 (13%)	1.000
Sports	2 (17%)	3 (8%)	0.325

Treatment	≥ 6 Month Follow-up (N = 12)	< 6 Month Follow-up (N = 40)	p-values
Casting	7 (58%)	17 (43%)	0.510
Closed Reduction and Casting	3 (25%)	21 (52%)	0.113
Closed Reduction and Percutaneous Pinning	1 (8%)	2 (5%)	0.553
Open Reduction and Internal Fixation	1 (8%)	0 (0%)	0.231

## DISCUSSION & CONCLUSIONS

- The rate of distal ulna physeal arrest was 0%, which is in contrast to previous studies reporting 50-55%
- The majority of patients with distal ulna physeal fractures do well with conservative management, and may only require routine clinical and radiographic follow-up