



## Background

- Distal radioulnar joint (DRUJ) is a complex and inherently unstable articulation with injuries often leading to pain, instability, and arthritis.
- Stability of this articulation is conferred, in part, by bony congruency between the sigmoid notch of the distal radius and the ulnar head.
- The purpose of this study is to report the incidence of the described sigmoid notch morphologies in patients with traumatic wrist injury and assess the impact of these anatomic variations on fracture pattern and DRUJ stability.

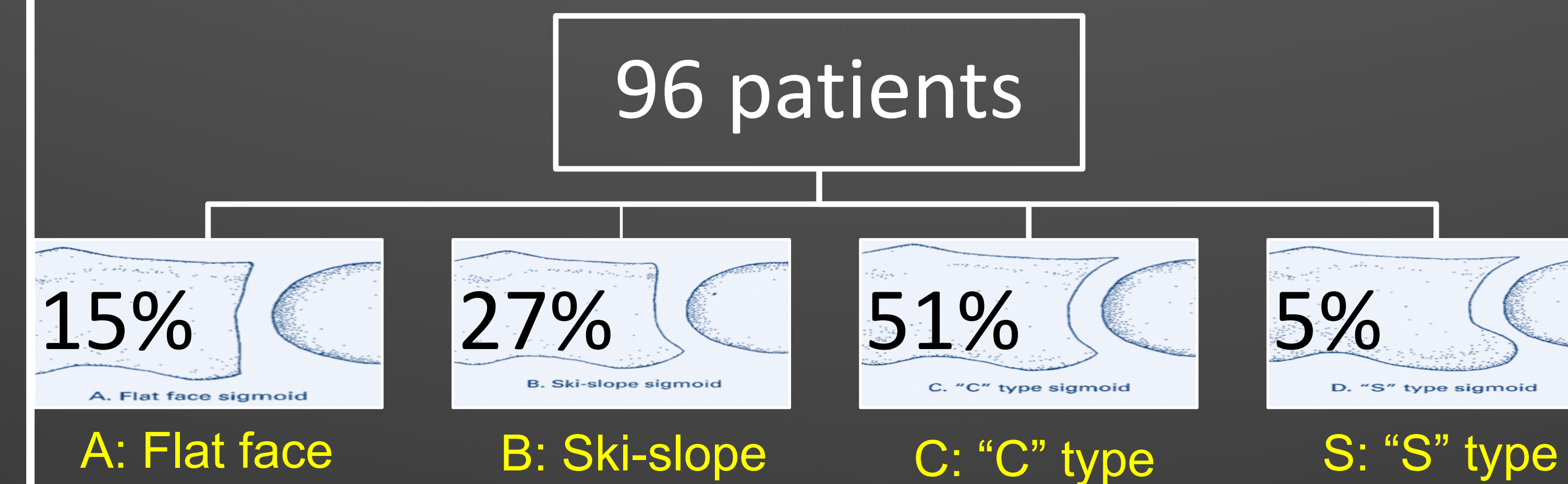
## Methods

- Retrospective institutional database review was performed to identify all distal radius fractures and any associated or isolated distal radioulnar joint injuries diagnosed at a single academic medical center from 2015 through 2019.
- Only patients with CT scans at time of injury were included in this analysis.
- Exclusion criteria were not having undergone CT scan or skeletal immaturity at time of injury.
- Demographic information and radiographic parameters were extracted using a predetermined spreadsheet by two independent reviewers.
- Statistical analysis was performed using chi-squared test and Fisher's exact test.

## Results

- A total of 96 patients were evaluated, 48 males and 48 females (**Figure 1**).

Figure 1



- Males and females had a **significant difference** in sigmoid morphology (**Table 1**).
- Females more likely to have flat-face and "C" type notches.
- Males more likely to have ski-slope morphologies.

Selected Patient Demographics

	A	B	C	S	p
Age, y	41.1	50.7	51.4	55.3	0.177
Sex, n (%)					0.037
Male	5 (10.4)	19 (39.6)	22 (45.8)	2 (4.2)	
Female	9 (18.8)	7 (14.6)	27 (56.3)	5 (10.4)	

**Table 1:** Selected patient demographics by DRUJ morphology demonstrating a significant difference in morphology distribution between males and females.

- No correlation was found between sigmoid morphology and specific fracture patterns, likelihood of requiring supplemental DRUJ fixation, or involvement of the volar or dorsal lunate facet (**Table 2**).

Patterns of Osseous Injury

	A	B	C	S	p
Fracture pattern (AO), n (%)					0.415
A	1 (7.1)	2 (7.7)	4 (8.2)	0 (0.0)	
B	0 (0.0)	5 (19.2)	10 (20.4)	3 (42.9)	
C	11 (78.6)	18 (69.2)	35 (71.4)	4 (57.1)	
DRUJ alone	2 (14.3)	1 (3.8)	0 (0.0)	0 (0.0)	
Supplemental DRUJ fixation?					0.933
Yes	3 (21.4)	4 (15.4)	4 (8.2)	0 (0.0)	
No	11 (78.6)	22 (84.6)	45 (91.8)	7 (100.0)	
Ulnar styloid involved?					0.775
Yes	4 (28.6)	11 (42.3)	22 (44.9)	4 (57.1)	
No	10 (71.4)	15 (57.7)	27 (55.1)	3 (42.9)	
Lunate facet involvement?					
Dorsal	6 (42.3)	17 (65.4)	35 (71.4)	4 (57.1)	0.482
Volar	2 (14.3)	4 (15.4)	9 (18.4)	1 (14.3)	1.000

**Table 2:** Patterns of osseous injury were analyzed with respect to DRUJ morphology and no significant associations were found.

## Conclusions

- Differences in sigmoid notch morphology have been theorized to confer varying degrees of bony stability to the distal radioulnar joint.
- This study finds that sigmoid notch morphologies are not associated with patterns of injury or DRUJ instability.
- Significant differences are present in the bony morphology of males versus females, with males being significantly more likely to have "ski-slope" morphology.
- A detailed understanding of this bony morphology and any gender-related variations is important for treating these injuries and restoring optimal function to the hand and wrist.

## Limitations

- Decision for supplemental DRUJ fixation was based on surgeon-specific intraoperative assessment, introducing subjectivity.
- Significant intra-articular comminution may potentially limit ability to assess native anatomy.

## Future Studies

- Biomechanical study evaluating motion at the DRUJ with various sigmoid morphologies.
- Clinical outcome analysis of different DRUJ fixation methods and likelihood of malreduction by sigmoid notch morphology.

*The authors have no disclosures to report relevant to this study.*