

SHARED DECISION-MAKING AND OUTCOMES OF OPERATIVE VS. NON-OPERATIVE TREATMENT OF COMPLETELY DISPLACED CLAVICLE FRACTURES IN ADOLESCENTS BASED ON RACIAL, ETHNIC, AND SEX-BASED DIFFERENCES

FACTS STUDY GROUP

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Disclosures

Dr. Heyworth is a paid consultant for Arthrex, Inc. and Kairos Surgical.

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Clinician-Investigators



Background

- **Significant controversy associated with optimal management of adolescent clavicle fractures.**
- **Multiple studies have been published looking at risk factors for short- and long-term outcomes.**
- **Delivery of healthcare has been shown to be affected by race, ethnicity, sex, SES, and other socio-demographic measures. There exists a need to identify if these factors impact outcomes and what it means in the course of care.**
- **Current literature has described disparities in injuries, but not designed to look at disparities associated with outcomes.**
- **From a provider perspective, disparities exist due to implicit bias, which may change what is offered to patients, how decision-making is made for controversial topics (e.g. clavicle fracture), and how patients process information, leading to disparities. These implicit biases can account for differences sometimes seen in outcomes.**

Purpose

The purpose of the current study was to evaluate differences in treatment decisions made for cohorts of adolescents (10-18 years old) with completely displaced clavicle fractures, which were sub-stratified based on sex, ethnicity, and race.

Study Design

FACTS Initial Cohort

- **2013 – 2022**
- **8 geographically diverse, tertiary pediatric orthopedic centers**
- **Ages 10-18**
- **All completely displaced midshaft clavicle fractures**

Methods

Demographic Data

- Age, sex, race, ethnicity, insurance type

Treatment Data

- Non-operative vs. ORIF

Primary Outcome Measures (Validated PROs)


- ASES
- QuickDASH

ASES Assessment Form

PATIENT SELF-EVALUATION

Are you having pain in your shoulder? (circle correct answer) Yes No

Mark where your pain is on this diagram:



Do you have pain in your shoulder at night? Yes No

Do you take pain medication (aspirin, Advil, Tylenol etc.)? Yes No

Do you take narcotic pain medication (codeine or stronger)? Yes No

How many pills do you take each day (average)? pills

How bad is your pain today (mark line)?

No pain at all 0 Pain as bad as it can be 10

Does your shoulder feel unstable (as if it is going to dislocate)? Yes No

How unstable is your shoulder (mark line)?

Very stable 0 Very unstable 10

Circle the number in the box that indicates your ability to do the following activities:
0 = Unable to do; 1 = Very difficult to do; 2 = Somewhat difficult; 3 = Not difficult

ACTIVITY	RIGHT ARM	LEFT ARM
1. Put on a coat	0 1 2 3	0 1 2 3
2. Sleep on your painful or affected side	0 1 2 3	0 1 2 3
3. Wash back/do up bra in back	0 1 2 3	0 1 2 3
4. Manage toileting	0 1 2 3	0 1 2 3
5. Comb hair	0 1 2 3	0 1 2 3
6. Reach a high shelf	0 1 2 3	0 1 2 3
7. Lift 10 lbs. above shoulder	0 1 2 3	0 1 2 3
8. Throw a ball overhand	0 1 2 3	0 1 2 3
9. Do usual work - List:	0 1 2 3	0 1 2 3
10. Do usual sport - List:	0 1 2 3	0 1 2 3

OF THE ARM, SHOULDER AND HAND

DASH

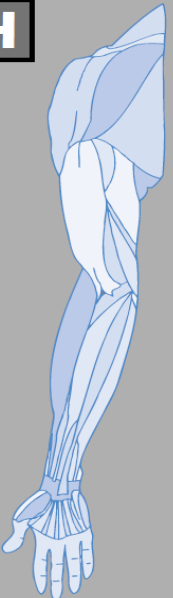
INSTRUCTIONS

This questionnaire asks about your symptoms as well as your ability to perform certain activities.

Please answer every question, based on your condition in the last week, by circling the appropriate number.

If you did not have the opportunity to perform an activity in the past week, please make your *best estimate* on which response would be the most accurate.

It doesn't matter which hand or arm you use to perform the activity; please answer based on your ability regardless of how you perform the task.



Results – Demographics

- 762 patients (229 operative, 533 non-operative)
- Mean age was 14.4 years
- 79% of patients were Male (sex)
- 15% of patients identified as Hispanic (ethnicity)
- 77% of patients identified as White (race)
- 69% of patients had private insurance

Table 1. Cohort summary (N=762)		
Characteristic	Freq.	(%)
Age at injury (<i>years; mean (SD)</i>)	14.4	(2.1)
Male sex	600	(79%)
Ethnicity		
Not Hispanic	647	(85%)
Hispanic	113	(15%)
Unknown	2	(0%)
Race		
White	589	(77%)
Black	46	(6%)
Asian	32	(4%)
Native American	1	(0%)
Hawaiian	2	(0%)
Multiple races	22	(3%)
Unknown	70	(9%)
Insurance type		
Private	529	(69%)
Public	185	(24%)
Military	19	(3%)
Out-of-Pocket	21	(3%)
Unknown	8	(1%)

Results – Treatment

- **Sex:**
 - Significantly higher rate of female patients underwent non-operative treatment ($p=0.04$)
- **Ethnicity:**
 - A significantly higher rate of Hispanic patients underwent non-operative treatment ($p=0.003$)
- **Race:**
 - There were no significant differences between treatment groups based on race, as analyzed between White ($p=0.15$), Black ($p=0.83$), Asian/Pacific Islander ($p=0.22$), and Multiracial ($p=1.00$)

Results – PROs

The majority of patients provided PROs at 1 or 2 years post-treatment (26.5 (+/-10.5) months).

- **Sex:**
 - Regardless of treatment, male patients reported significantly higher PROs than female patients ($p<0.001$).
- **Sex/Ethnicity:**
 - Within subgroups, male ($p=0.02$) and non-Hispanic ($p=0.02$) NonOp patients reported significantly higher scores on both PROs than ORIF patients.
- **Race:**
 - Black NonOp patients reported significantly higher ASES scores than Black ORIF patients. Asian NonOp patients reported significantly higher QuickDASH scores than Asian ORIF patients.
- **Other subgroups did not show significant differences in PROs.**

Discussion

Female and Hispanic patients were less likely to receive operative treatment.

Males reported higher PROs than females.

Four NonOp subgroups (Male, non-Hispanic, Black, Asian) reported higher PROs than ORIF patients.

Discussion

Reporting of outcomes based on sex, ethnicity, and race are necessary to not only understand health care disparities but also outcomes of treatment.

Outcomes of treatment are impacted by more than just treatment protocols, radiographs, and non-operative methods or surgical technique.

The degree to which these differences in treatment selection are influenced by caregiver biases vs. sub-population differences warrants future study to insure equitable and appropriate care for this common adolescent injury.

Further study of insurance status and ADI is warranted.

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