Association between Surgical Fixation of Distal Radius Fracture and Race: A National Database Study

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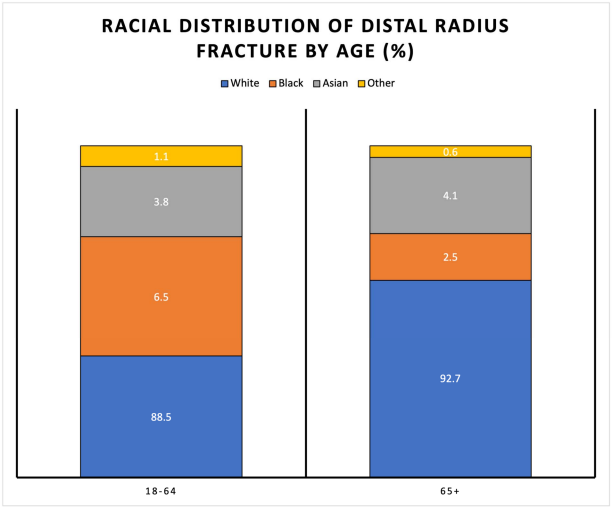
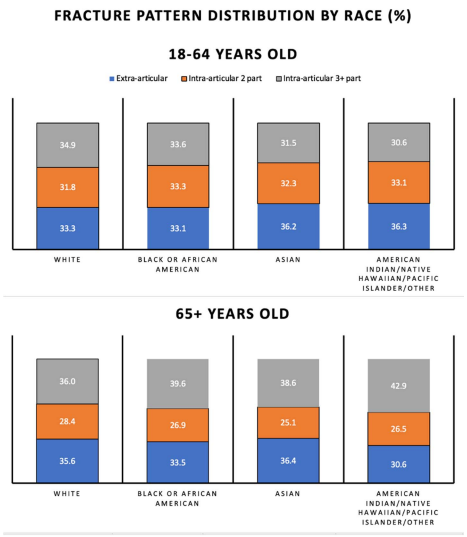
INTRODUCTION:
Distal radius fractures (DRF) are among the most common fractures encountered by orthopaedic surgeons. Per ASSH/AAOS clinical practice guidelines, there is strong evidence to support nonsurgical management of geriatric fractures and moderate evidence to support operative fixation of non-geriatric fractures with certain radiographic parameters. However, less is known about the association between race, fracture morphology, and operative fixation practices in non-geriatric and geriatric age groups. The purpose of this study was to assess the relationship between age, race, and fracture morphology in a large database of operatively managed fractures. We hypothesized there was a significant difference in the racial distribution of non-geriatric and geriatric cohorts of operatively treated DRFs, possibly indicating a racial disparity in operative fixation of geriatric DRFs. We additionally hypothesize that race is associated with fracture morphology.
METHODS:
Utilizing the National Surgical Quality Improvement Program (NSQIP) database, we identified patients undergoing operative fixation of DRFs between 2014-2020. Patients were divided into non-geriatric (18-64) and geriatric (65+) cohorts and stratified by race (White, Black, Asian, Native American / Hawaiian / Pacific Islander / Other) and fracture pattern (extra-articular, intra-articular 2-part, intra-articular 3+ part). Chi-square analyses were performed to compare racial and fracture pattern distribution among cohorts.
RESULTS:
A total of 21,680 cases of operatively treated DRFs with sufficient racial data were identified, including 13,943 (64.3%) non-geriatric and 7,737 (35.7%) geriatric fractures. There was a significant difference in racial distribution of operatively treated DRFs between non-geriatric (88.5% White/6.5% Black/3.8% Asian/1.1% Other) and geriatric (92.7% White/2.5% Black/4.1% Asian/0.6% Other) cohorts ($p<0.005$) (Table 1). In both non-geriatric and geriatric cohorts, there was no significant difference in fracture pattern distribution by race ($p > 0.5$) (Table 2). There were significant differences in fracture pattern between non-geriatric (33.4% extra-articular/31.9% intra-articular 2-part/34.7% intra-articular 3+ part) and geriatric (35.6% extra-articular/28.2% intra-articular 2-part/36.2% intra-articular 3+ part) cohorts ($p<0.005$).
DISCUSSION AND CONCLUSION:
Given the high incidence of DRFs in the general population, there has understandably been considerable research conducted into the fractures and patient cohorts most likely to benefit from operative fixation versus nonsurgical management. While this research has culminated in clinical practice guidelines supporting nonsurgical management of geriatric DRFs, there has been a paucity of research examining the association between race, fracture fixation, and fracture morphology. Our study demonstrates that despite both geriatric and non-geriatric cohorts having a similar fracture morphology distribution between race (implying a similar burden of fracture complexity), there are still significant differences between the two cohorts with respect to operation fixation rates within our database. There was a proportionally higher number of white patients receiving operative intervention in the geriatric cohort compared to other races. While there are certainly limitations to this study in that the proportion of nonsurgically treated DRFs was not available in our database, our findings still suggest that a racial disparity in access to geriatric DRF fixation may exist. Additional research is analyze this disparity in isolation of other confounding variables and to understand why minority patients undergo operative intervention at lower rates for geriatric DRFs.


RACIAL DISTRIBUTION OF DISTAL RADIUS FRACTURE BY AGE (%)
White
Black
Asian
Other
1.1
3.8
6.5
88.5
0.6
4.1
2.5
92.7
18-64
65+


FRACTURE PATTERN DISTRIBUTION BY RACE (%)
18-64 YEARS OLD
Extra-articular
Intra-articular 2 part
Intra-articular 3+ part
34.9
31.8
33.3
33.6
33.3
33.1
31.5
32.3
36.2
30.6
33.1
36.3
WHITE
BLACK OR AFRICAN AMERICAN
ASIAN
AMERICAN INDIAN/NATIVE HAWAIIAN/PACIFIC ISLANDER/OTHER
65+ YEARS OLD
36.0
28.4
35.6
39.6
26.9
33.5
38.6
25.1
36.4
42.9
26.5
30.6
WHITE
BLACK OR AFRICAN AMERICAN
ASIAN
AMERICAN INDIAN/NATIVE HAWAIIAN/PACIFIC ISLANDER/OTHER