Variation Amongst Orthopedic Surgeons When Treating Fifth Metacarpal Neck Fractures in the Pediatric Population

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INTRODUCTION

- Fifth metacarpal neck fractures are common fractures affecting the pediatric population.
- Commonly caused by direct trauma to hand, such as that caused by hitting a closed fist against a solid surface ("Boxer’s fracture").
- Variations in management and treatment of metacarpal neck fractures between surgeons may exist.
  - Variability potentially increases with more severe angulation of the fracture.
  - To our knowledge, no standardization exists regarding the treatment of 5th metacarpal neck fractures.
- Purpose: To determine if variation exists amongst orthopedic surgeons in treating pediatric fifth metacarpal neck fractures and determine the factors regarding this variation.

RESULTS

- Associations for Deciding to Operate: Age and angulation.
- Not Associated with Decision to Operate: Sex, cast status, presence/absence of labeling on image.
- Angulation as a Factor for the Decision to Operate: Greater than 50% of surgeons would choose surgical intervention if the degrees of angulation in the PA and lateral views were ≥55 degrees and ≥47 degrees, respectively.
- Age Impact: Age alone was also identified as an independent factor for choosing operative intervention, with 42% of surgeon’s operating on patients aged 17 years.
- Of the 750 images viewed, 27% were selected for operative intervention.

METHODS

- Research Design: Prospective, Survey
- Targeted Audience: Orthopedic surgeons
- Sample Size: 25 responses
- Survey Length: Twenty-five sets of images of pediatric fifth metacarpal neck fractures with posteroanterior (PA), oblique, and lateral views were identified.
- Angulation Marking: Fracture angulation measurements were made for the lateral and oblique views, with half of the images unmarked to assess the effect of marked angulation on treatment decision.
- Duplication Feature: Five images were duplicated to assess variability of a surgeon's treatment choice.
- Associated Clinical Vignettes: Each set of radiographs was accompanied by a clinical vignette which included the patient’s sex and age.
- Question Assessed: Is operative intervention required?
- Statistics: A mixed effect model with the respondent as the random effect to determine which patient/radiographic factors were most associated with a decision to operate was performed.

CONCLUSIONS

- Treatment of fifth metacarpal neck fractures in the pediatric population is not standardized.
- Worsening angulation above approximately 50 degrees and increasing age (adolescence) appear to be the most important factors when deciding to operate.
- Improved treatment algorithms based on outcomes studies are needed to determine the optimal treatment.