

## Introduction

- ❖ Current literature on fifth metacarpal fractures is notable for differing opinions and a lack of consensus regarding ideal indications for operative management
- ❖ Indications for operative intervention include open fractures, neurovascular impairment, severe comminution, malrotation and multiple fractures<sup>(1)</sup>
- ❖ The degree of neck angulation that can be treated non-operatively ranges from 40 degrees up to 70 degrees<sup>(2)</sup>
- ❖ With conflicting recommendations for the treatment of fifth metacarpal fractures, most fractures are referred to hand surgical practices

## Objectives

- ❖ Due to this uncertainty, we aimed to review patient demographic information and radiographs to create a classification system of fifth metacarpal fractures
- ❖ The classification system was based on radiographic fracture characteristics and the rates of surgical intervention with the objective of identifying high risk fracture patterns to help guide referrals to hand surgery

## Methods

- ❖ 100 radiographs of patients with fifth metacarpal fractures were reviewed by the first author under the supervision of the attending hand surgeon
- ❖ Demographic and radiographic data collected included: fracture location, pattern, amount of displacement, angulation, shortening, comminution and other associated fractures or dislocations
- ❖ Whether patients underwent a closed reduction or operative fixation (closed reduction percutaneous pinning or open reduction internal fixation) was documented

## Results

- ❖ 100 patients (70 males, 30 females) were identified with fifth metacarpal fractures during the months of May to August 2014
- ❖ Average age was 30.5 years (range of 17 to 75 years of age)
- ❖ The most common mechanism of injury was an altercation in 80 of 100 cases
- ❖ The most common fifth metacarpal fracture location was a neck (Boxer's) fracture identified in 48 of the 100 cases
- ❖ The most common fracture pattern was a transverse fracture identified in 46 of the 100 cases
- ❖ The majority of the fractures (67 of the 100) were angulated
- ❖ The majority of the fractures (83 of the 100) were extra-articular
- ❖ Of the 100 fractures, 13 were associated with other fractures

Table 1. A radiographic classification system of fifth metacarpal fractures

Type	Description	Criteria	Diagram
Type 1	Non-displaced		
Type 2	Head/Neck fracture	a < 40 ° b > 40 °	a  b 
Type 3	Shaft fracture	a < 30 ° b > 30 °	a  b 
Type 4	Base fracture	a - Intra-articular b - extra-articular	a  b 
Type 5	Spiral/Oblique fracture		 or 
Type 6	Multiple fractures or fracture/dislocation		 or 

❖ (1) Stern PJ. Management of fractures of the hand over the last 25 years. J Hand Surg [Am] 2000;25:817-23. doi: 10.1053/jhsu.2000.4214.  
❖ (2) Ford DJ, Ali MS, Steel WM. Fractures of the fifth metacarpal neck: is reduction or immobilisation necessary? J Hand Surg. 1989;14B:165-7.

Table 2. Fifth metacarpal fractures classified by type and operative fixation

Class:	Fracture Number	Number of ORs	Percentage of ORs
Type I	14	0	0
Type II	a	0	0
	b	5	38.5
Type III	a	0	0
	b	4	100
Type IV	a	0	0
	b	2	18.2
Type V	5	4	80
Type VI	13	3	23.1

## Discussion

- ❖ The majority of patients with fifth metacarpal fractures underwent a closed reduction of their presenting fractures (58 of the 100 cases)
- ❖ Eighteen patients went on to require operative treatment (18 fractures)
- ❖ The fracture patterns found to carry a higher likelihood of surgical intervention were:
  - (1) spiral oblique fractures (80% operative fixation)
  - (2) transverse midshaft fractures angulated > 30 degrees (100% operative fixation)
  - (3) patients with multiple fractures had a higher chance of undergoing an operative procedure than patients without multiple fractures (23%)
  - (4) fifth metacarpal neck (Boxer's) fractures with > 40 degrees angulation (38.5%)
- ❖ Fractures that did not seem to require operative treatment include:
  - (1) transverse midshaft fractures angulated < 30 degrees
  - (2) neck fractures angulated < 40 degrees

## Conclusions

- ❖ Certain fracture patterns (Type 3b and Type 5) appear to have higher rates of surgical intervention at 100% and 80% respectively
- ❖ For low risk radiographic types the physical examination and patient specific demographics should still guide the need for operative intervention
- ❖ This classification system allows practitioners to identify radiographic fracture patterns that are more likely to require surgical intervention and therefore guide referrals to hand surgery