

Is the diagnosis of 5th metatarsal fracture type consistent? An inter-observer reliability study.

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Introduction

Treatment pathways of 5th metatarsal fractures are commonly directed based on fracture classification, with Jones types for example, requiring closer observation and possibly more aggressive management. We sought to investigate the reliability of assessment of subtypes of 5th metatarsal fractures by different observers

Methods

Retrospective Analysis

- 02/2016 to 07/2021

Data Extraction

- 2 independent observers
- AP foot radiographs reviewed to classify
 - Image 1

Inclusion Criteria

- Suspected or confirmed 5th metatarsal fracture
- Referred to our Virtual Fracture Clinic

Exclusion Criteria

- Neither observer able to identify a fracture
- Images not available

Analysis

- Inter-observer reliability
 - Cohen's Kappa Co-efficient
 - Landis & Koch description (Table 1)
- All data analysed with IBM SPSS v. 27.

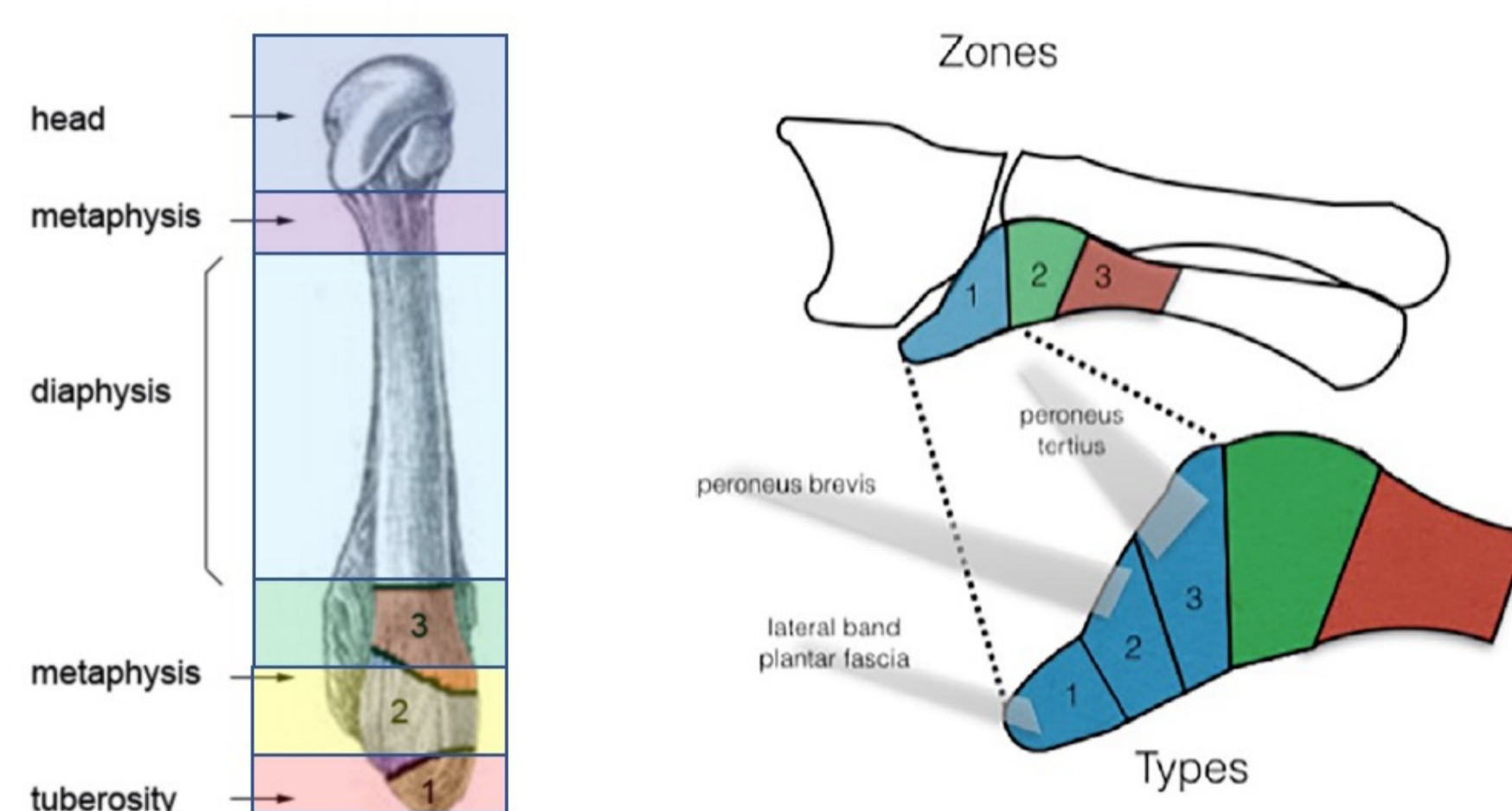


Image 1 – Classification of fracture zones used in this study

Results

1360 patients met the criteria

- Mean age 48.1 (SD = 19.1)

Maximum level of agreement

- Moderate (Table 2)

'Fair Agreement'

- Zone 1.2 (K = 0.308)
- Distal Metaphyseal (K = 0.381)

Kappa value range	Interpretation of Agreement
0-0.2	Slight
0.2-0.4	Fair
0.4-0.6	Moderate
0.6-0.8	Substantial
0.8-1.0	Almost Perfect

Table 1 – Landis & Koch Description of Inter-observer variability

Totals	Kappa value	P value
Zone 1.1	0.538	<0.001
Zone 1.3	0.511	<0.001
Zone 2	0.515	<0.001
Zone 3	0.57	<0.001
Diaphyseal Shaft	0.545	<0.001
Head	0.558	<0.001

Table 2 – Kappa values for all fracture regions achieving the moderate level of agreement

Adjacent Zonal Agreement

- Fair
 - Diaphyseal shaft & distal metaphyseal
- Slight
 - Next most proximal – 1.2, 1.3, Zone 3
 - Next most distal – 1.1, 1.2, 1.3, Zone 2, Zone 3, Distal Metaphyseal

Conclusion

The reliability of sub-categorising 5th metatarsal fractures using standardised instructions conveys moderate agreement in most cases.

Implications

If the region of the fracture is going to be used in an algorithm to guide a management plan and clinical follow up during a virtual clinic review, defining fractures of zones 1-3 needs careful consideration