

What's In a Name?

Prevalence of Metaphyseal Fractures
in Infants and Young Children with
Osteogenesis Imperfecta In the First
Two Years of Life

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Background

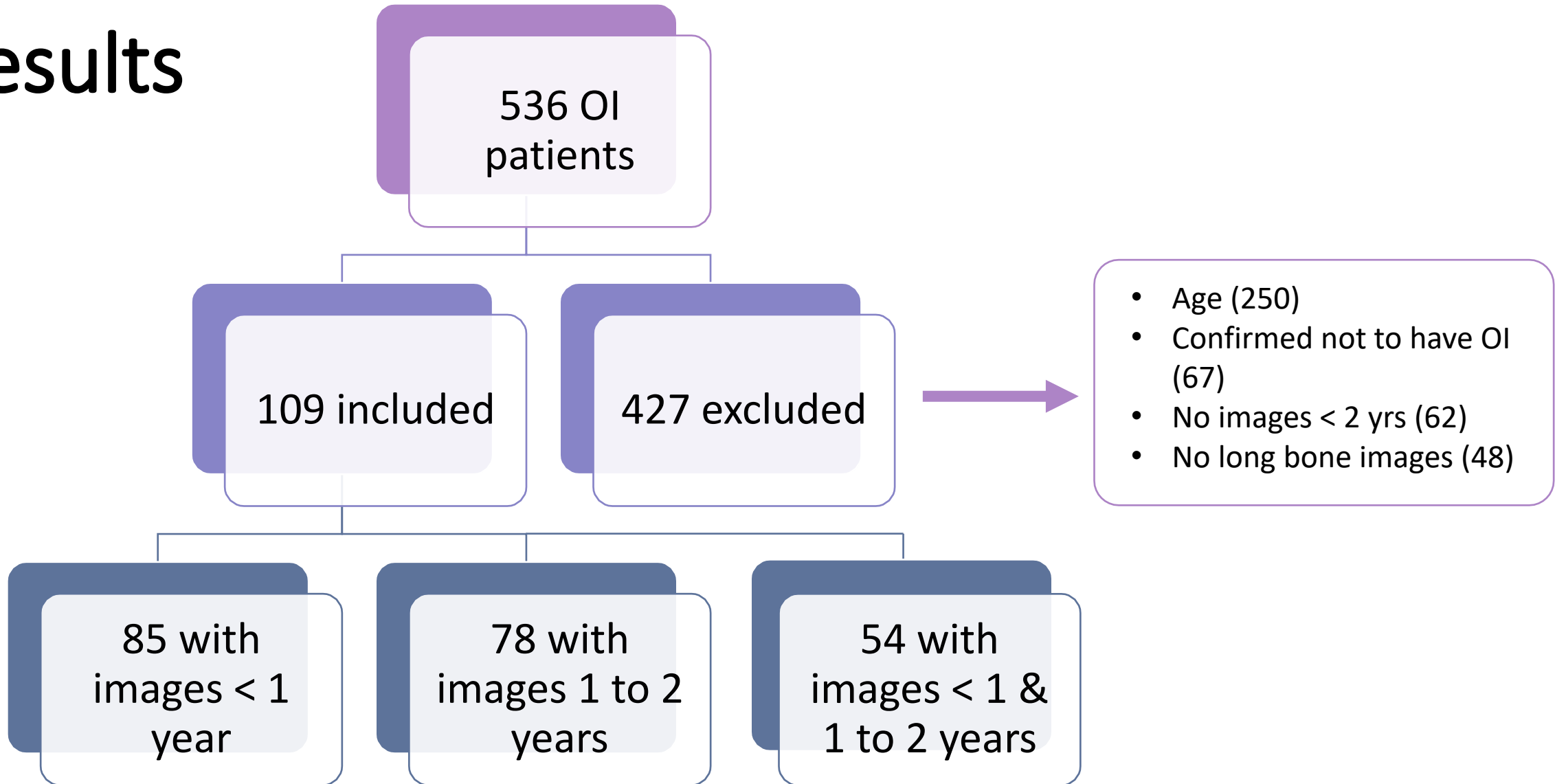
- Classic metaphyseal lesions (CMLs) have a high specificity for inflicted injury
 - Osteogenesis imperfecta (OI) is often suggested as a differential diagnosis in children with unexplained fracture(s)
 - Some have argued that CMLs occur in OI in the absence of inflicted injury
 - To our knowledge, there have been no large-scale studies investigating this controversial issue
 - This study aims to assess the prevalence of CMLs in infants with OI during the first two years of life
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Methods

- Retrospective review of radiographs
 - Patients attending OI clinic (Sheffield Children's Hospital)
 - 0 to 2 years of age
 - 1st January 2010 to 31st December 2021
 - Exclusion criteria
 - Other underlying disease
 - Fetuses
 - Data collected
 - Number/site/type of fractures
 - Presence of Wormian bones
 - Descriptive and inferential statistics
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Results



Groups

< 1 year

- 85 patients
- 1949 radiographs
- Sex → 44 F 41 M
- Ethnicity → 69 white, 1 mixed, 11 Asian, 3 other ethnic group, 1 unknown
- Type → 33 (I), 27 (III), 13 (IV), 9 (V), 1 (VII), 1 (IX), 1 (CC)

1 -2 years

- 78 patients
- 1193 radiographs
- Sex → 38 F 40 M
- Ethnicity → 62 white, 1 mixed, 11 Asian, 2 other ethnic group, 2 unknown
- Type → 27 (I), 20 (III), 16 (IV), 9 (V), 3 (VI), 1 (VII), 1 (XV), 1 (CC)

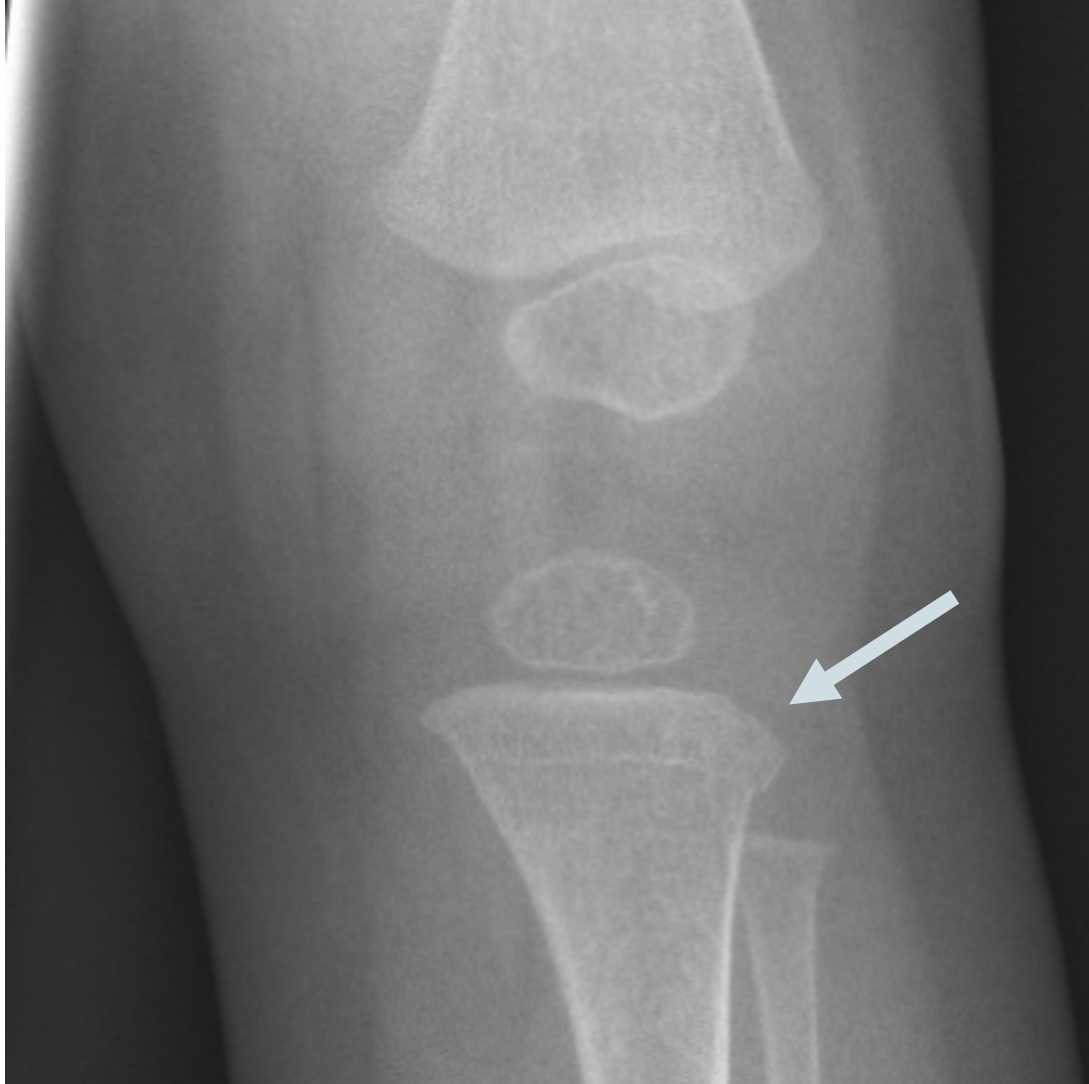
< 2 years

- 109 patients
- 3142 radiographs
- Sex → 53 F 56 M
- Ethnicity → 86 white, 1 mixed, 16 Asian, 3 other ethnic group, 3 unknown
- Type → 44 (I), 30 (III), 17 (IV), 11 (V), 3 (VI), 1 (VII), 1 (IX), 1 (XV), 1 (CC)

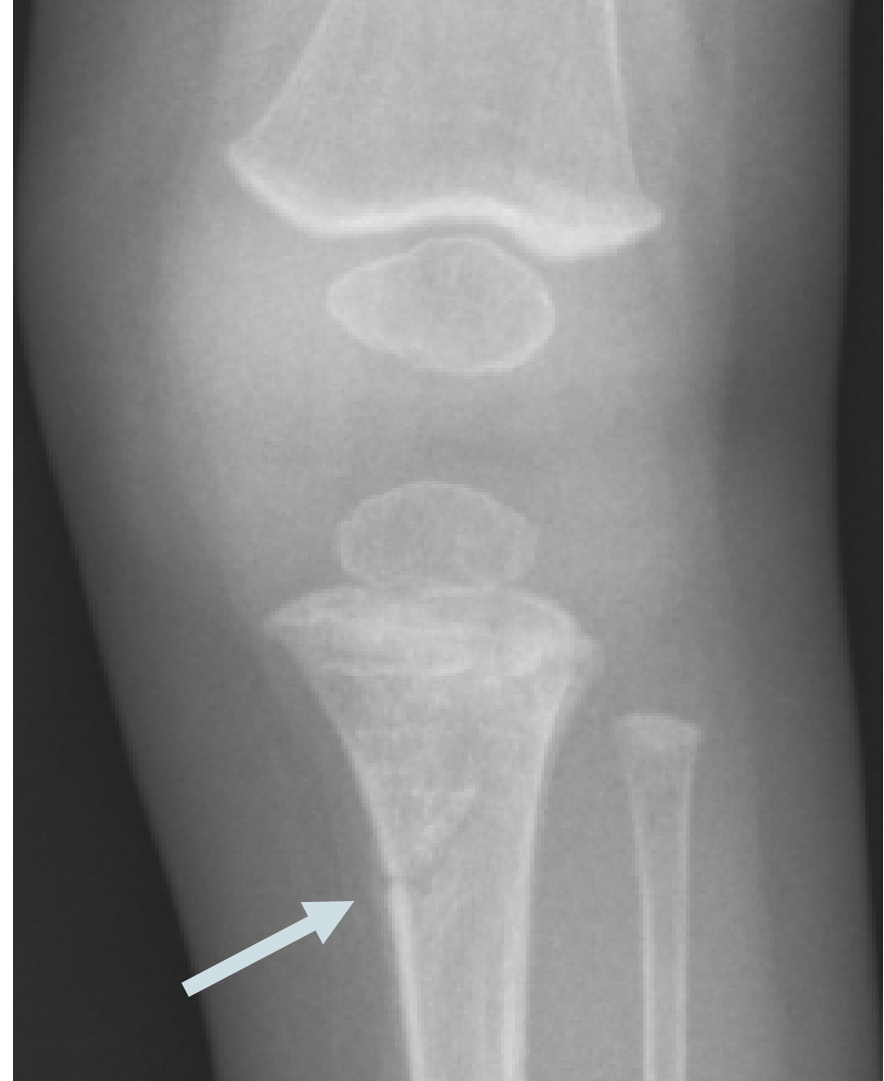
Classic Metaphyseal Lesions

- 3,142 radiographs in 109 patients: No CML
 - 13.5-month-old female
 - Possible left proximal tibia CML on initial imaging
 - Confirmed metadiaphyseal extension on follow-up imaging
 - Additional left clavicular and rib fractures (multiple bilateral + left posterior)
 - Type I OI (*COL1A2* mutation)
 - Parents separated (domestic violence)
 - Patient and brother currently subjects of ongoing abuse investigations
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Initial



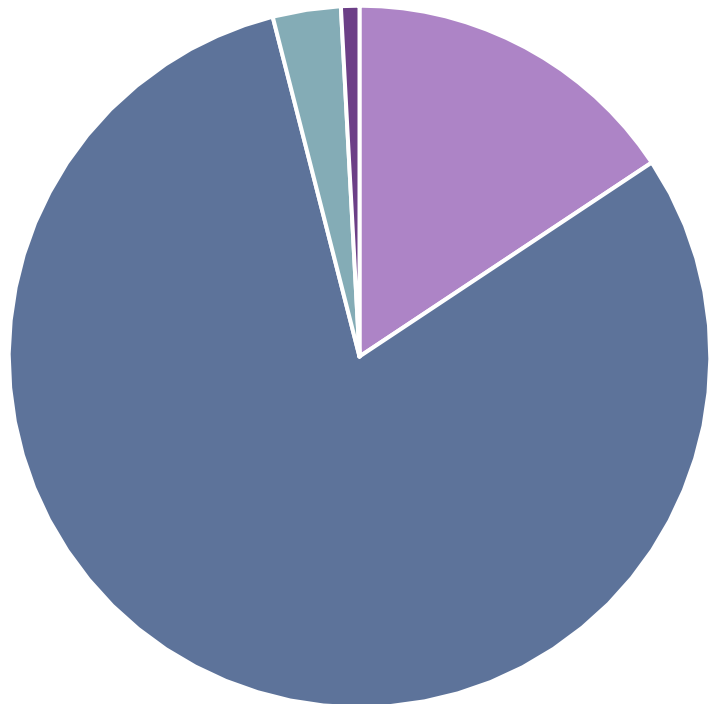
Follow-up



Metadiaphyseal Fractures

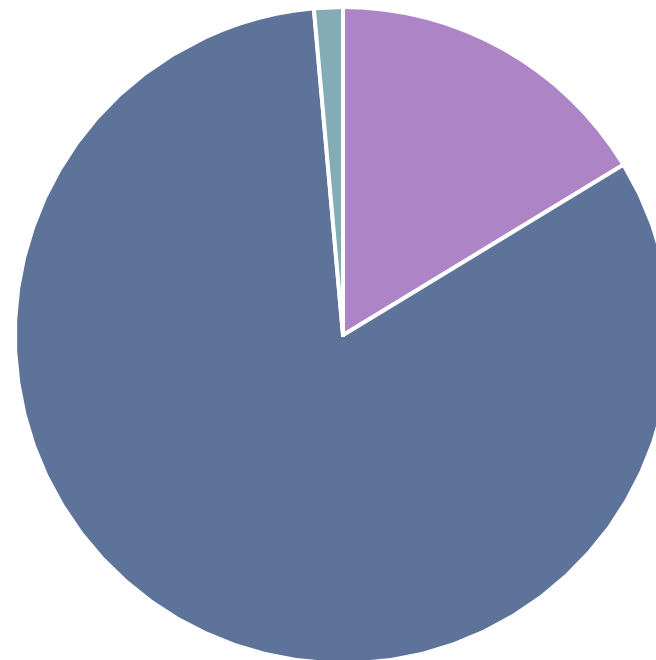
- Total < 2 years = 76
 - Total 1-2 years = 23
 - Total < 1 year = 55
 - Most fractures: 15, Cole-Carpenter type
 - Most common site = R D radius (< 1 year) & L D tibia (1-2 years)
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Percentage of Total Fractures Each Fracture Type Accounted For < 1 Year



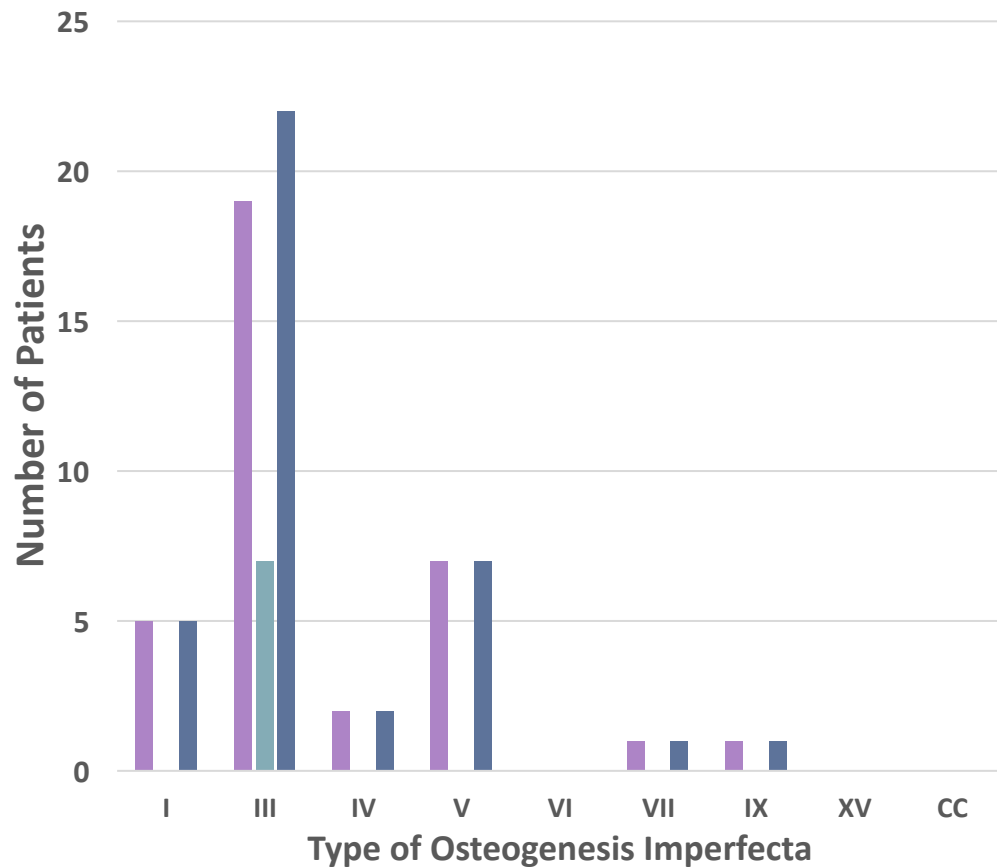
Metadiaphyseal Diaphyseal Clavicular Scapular

Percentage of Total Fractures Each Fracture Type Accounted For 1-2 Years



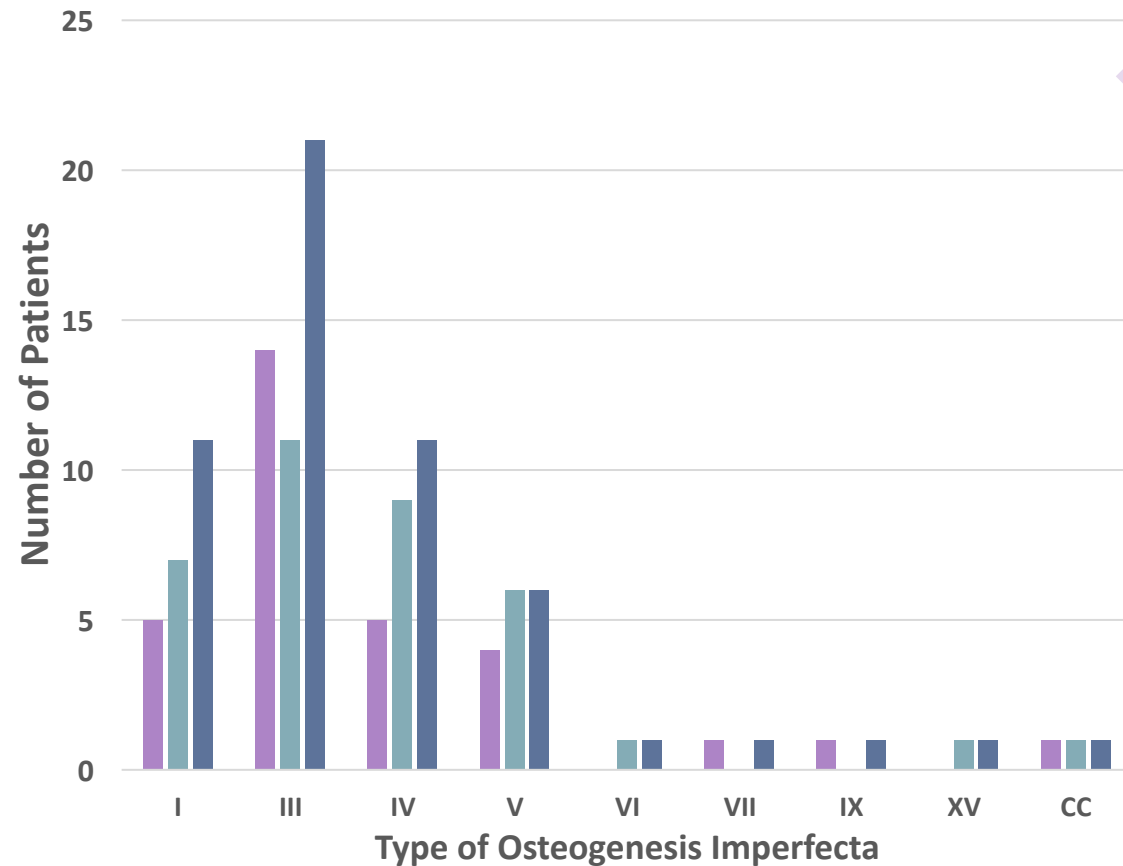
Metadiaphyseal Diaphyseal Clavicular Scapular

Patients with Rib Fractures by Type



< 1 year 1-2 years < 2 years

Patients with Vertebral Fractures by Type



< 1 year 1-2 years < 2 years



Conclusions

- No CMLs found in a relatively large cohort
 - Metadiaphyseal fractures are more common
 - Distinction should be made between “metaphyseal” and “metadiaphyseal”
 - OI and inflicted injury not mutually exclusive
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Implication

- In children < 2 years, CMLs should always raise the possibility of abuse, even in children with confirmed OI
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