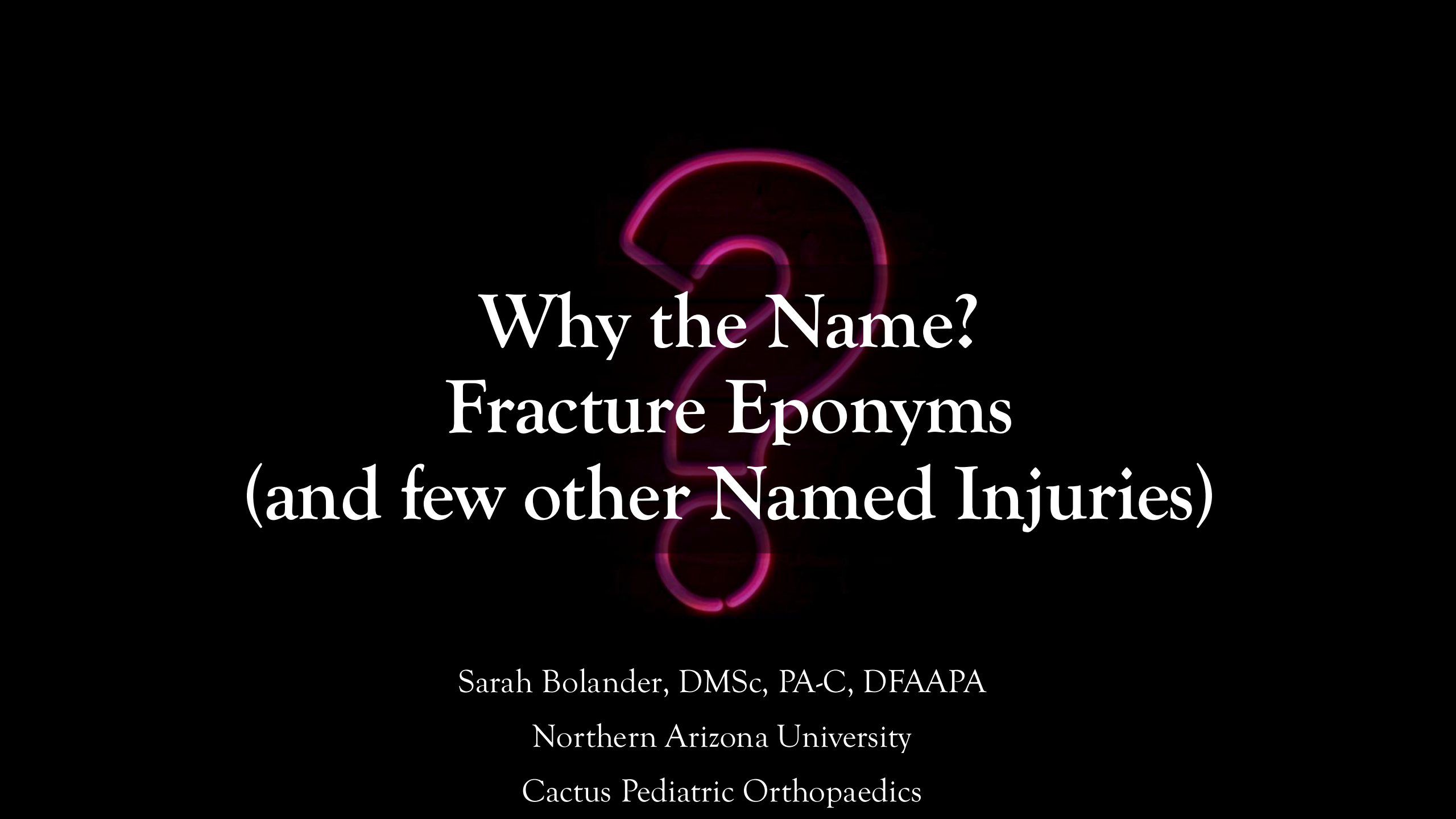

Why the Name? Fracture Eponyms (and few other Named Injuries)

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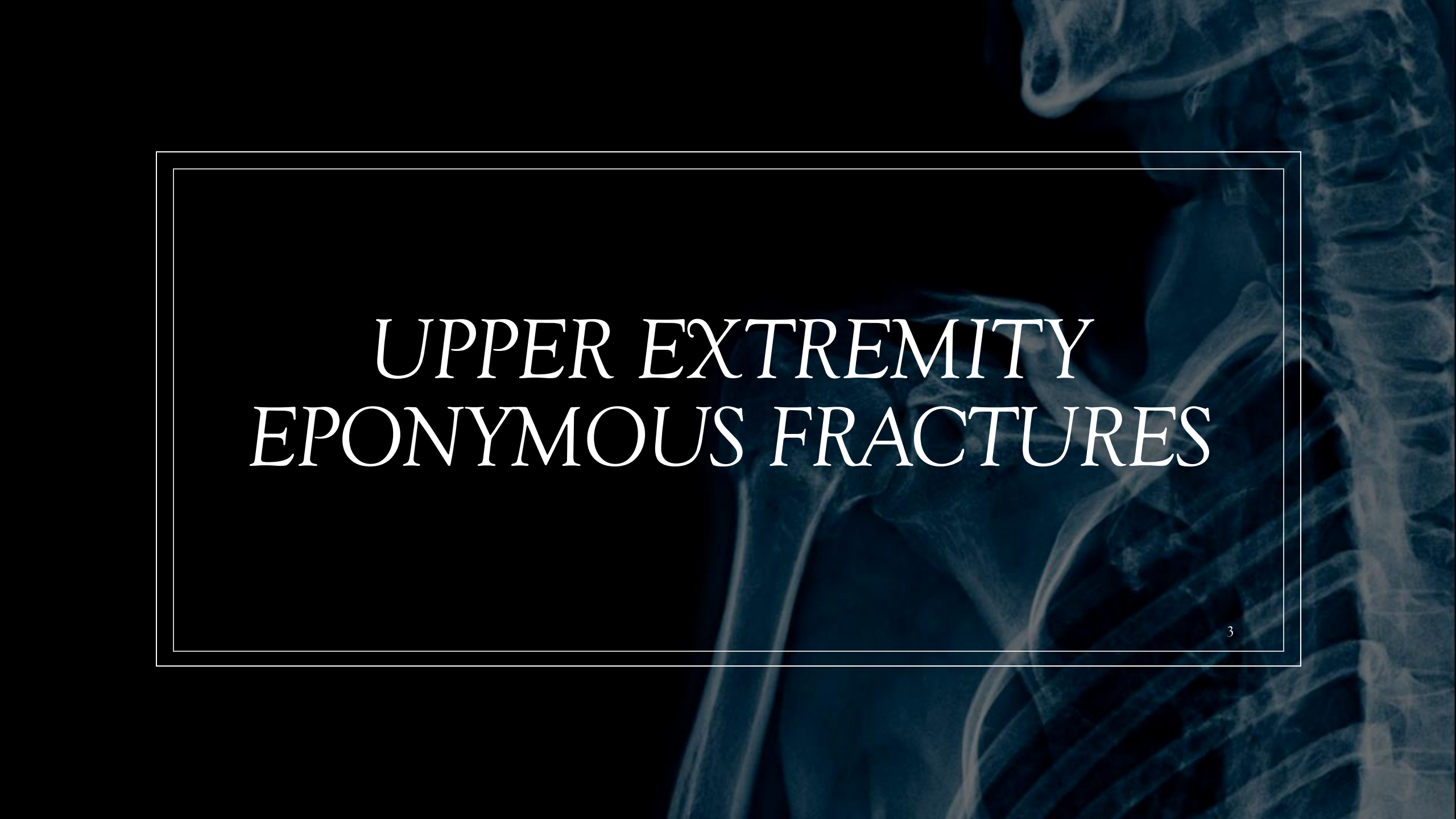
Northern Arizona University

Cactus Pediatric Orthopaedics

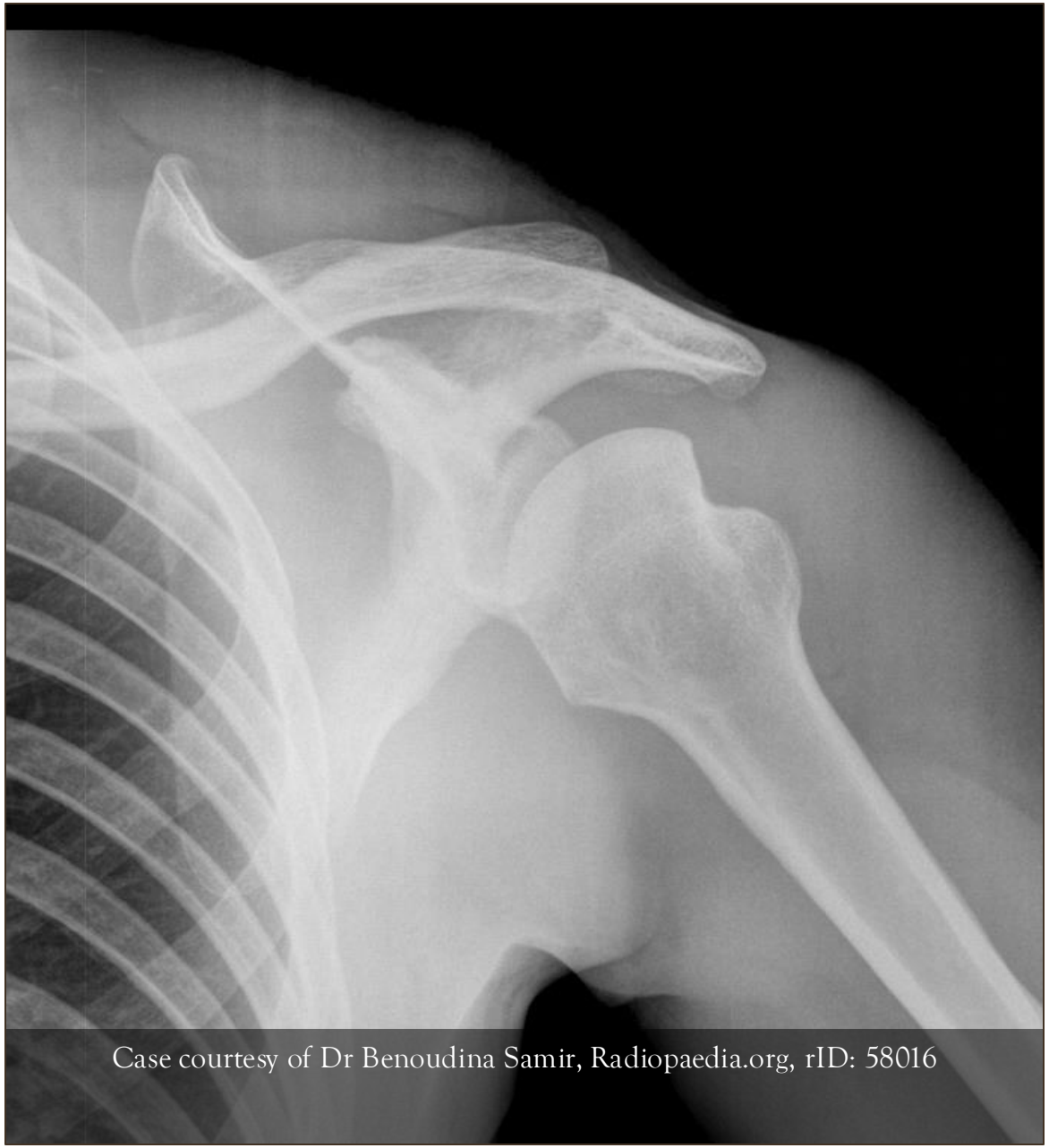
Eponymous Fractures/Fracture-Dislocations

- Named fractures for who first described, classified, or popularized the injury pattern
- **Benefit:** Provides rapid, succinct description of complex fracture patterns.
- **Disadvantage:** Often mistermed which creates confusion and misdirects management.

***Does not account for severity of the injury.*



UPPER EXTREMITY EPONYMOUS FRACTURES



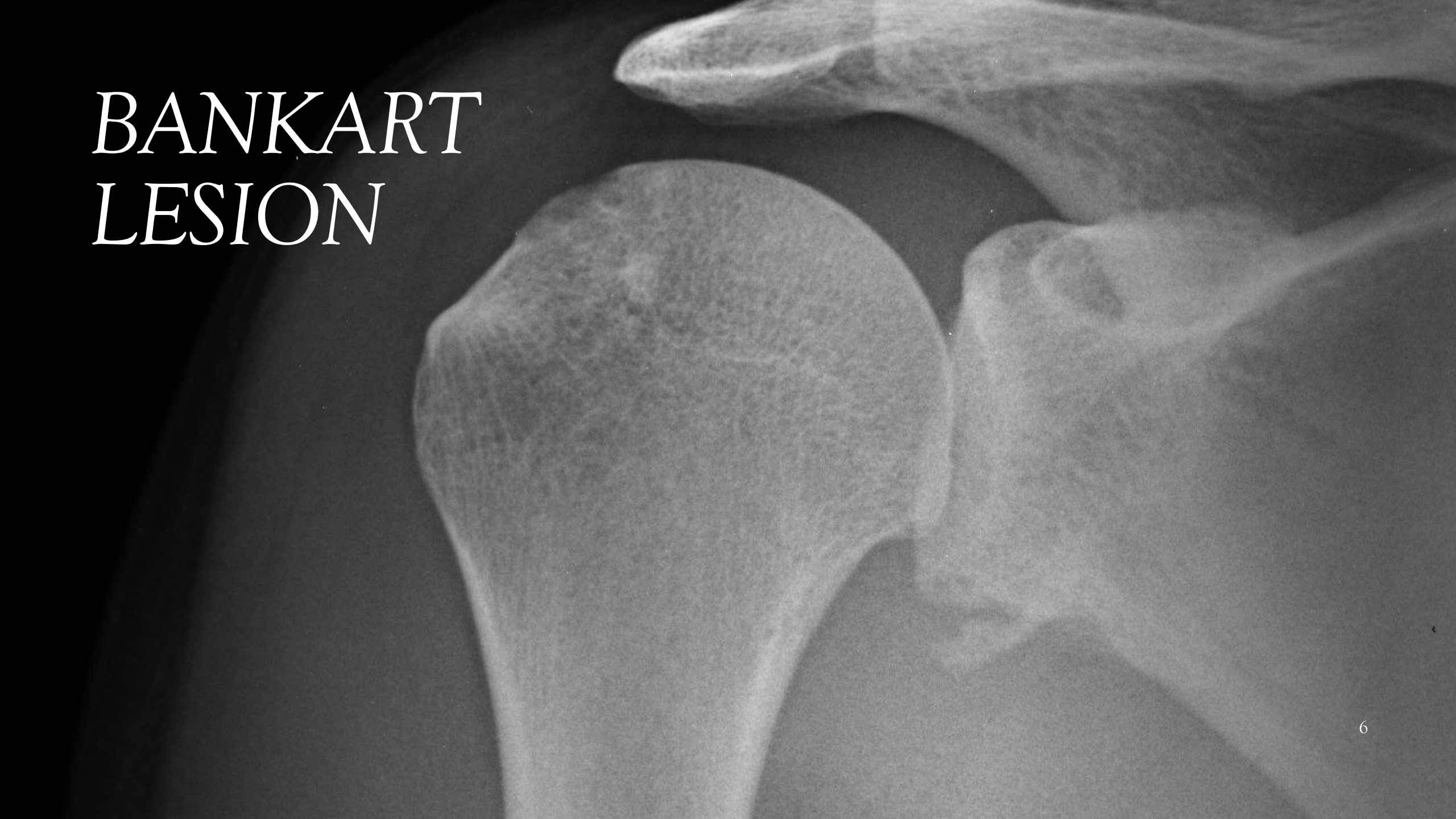
Case courtesy of Dr Benoudina Samir, Radiopaedia.org, rID: 58016

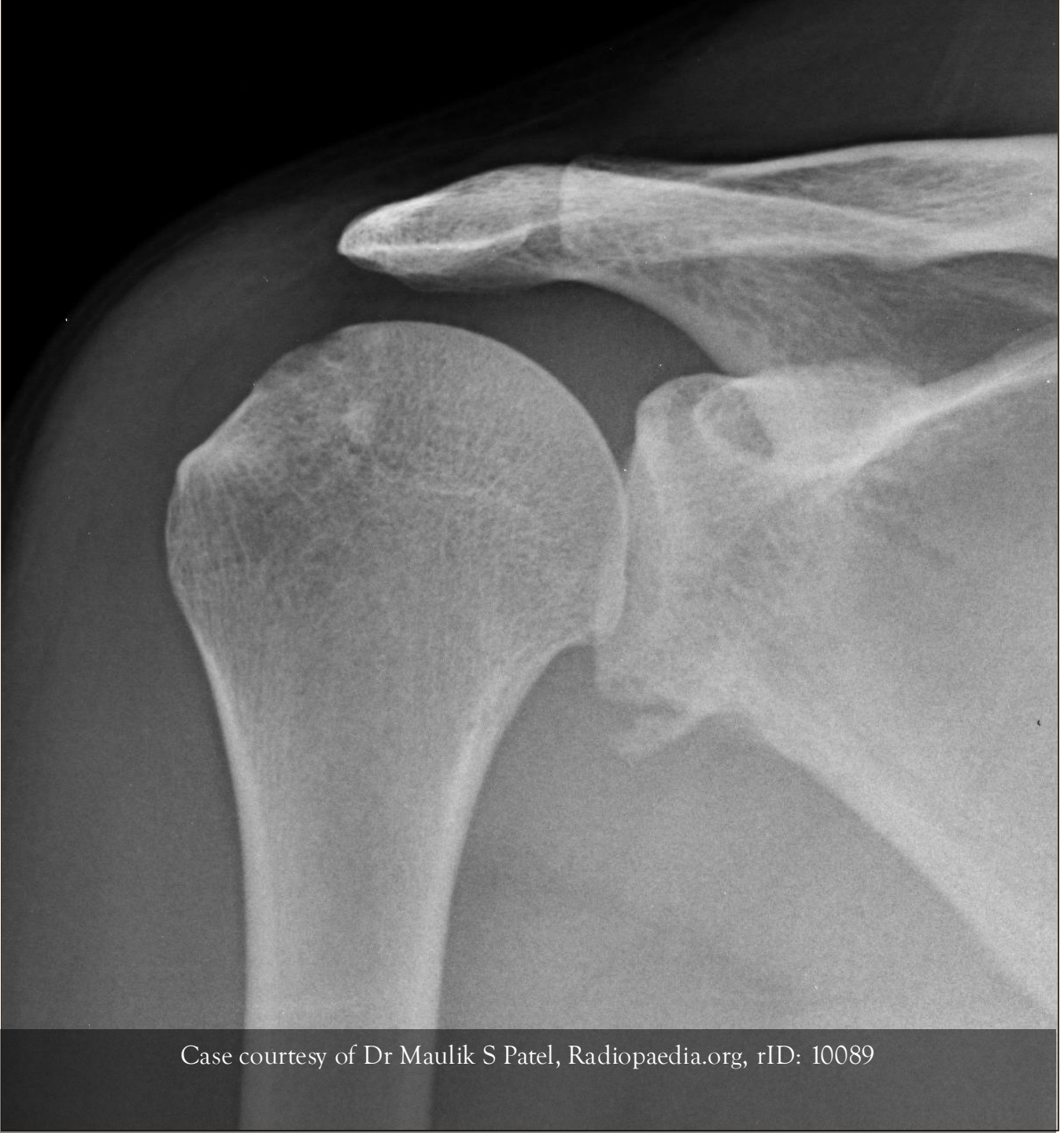
Hill Sachs Defect

- 1940: Radiologists Arthur Hill and David Sachs
- Pattern: impaction fracture of the posterolateral humeral head
- MOI: Anterior shoulder dislocations
  - Impaction- anterior glenoid rim

*AP with internal rotation of the shoulder necessary to avoid missing this defect

BANKART LESION





Case courtesy of Dr Maulik S Patel, Radiopaedia.org, rID: 10089

Bankart Lesion

- 1923: Orthopedic surgeon Arthur Bankart
- Pattern: Soft tissue injury of the anteroinferior labrum
- Bony Bankart: fracture of the glenoid
- MOI: anterior shoulder dislocation

**Commonly associated with Hill Sachs*

- Both are associated with an increased risk for instability and repeat dislocations

•Bankart ASB. Recurrent or habitual dislocation of the shoulder joint. Br Med J. 1923 Dec 15; 2(3285): 1132–1133.

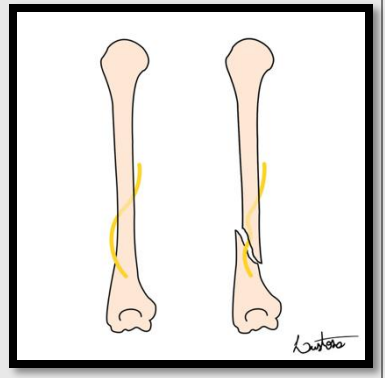

E

Case courtesy of Leonardo Lustosa, Radiopaedia.org, rID: 99968

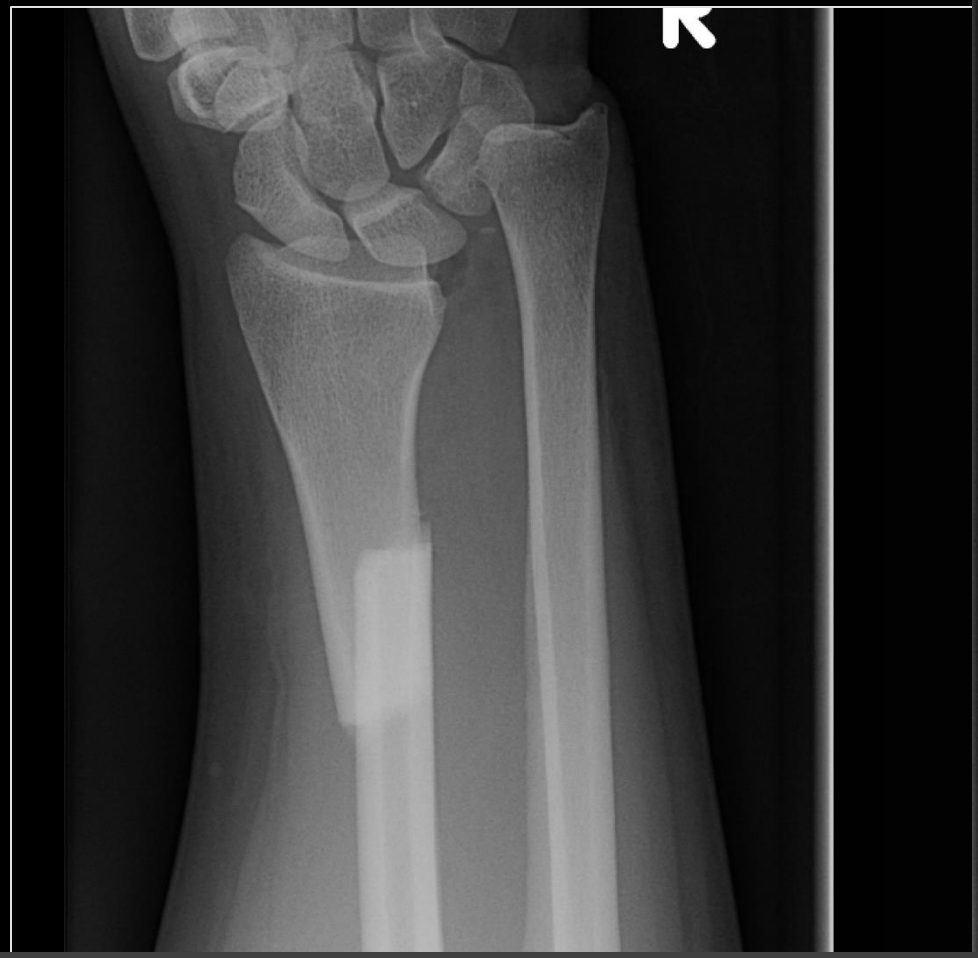
Holstein-Lewis Fracture

- 1963: Orthopedic surgeons Arthur Holstein and Gwilym Lewis
- Pattern: Spiral fx of the distal third of the humerus
- MOI: trauma

*Increased risk of radial nerve palsy



•Holstein A, Lewis GM. Fractures of the humerus with radial-nerve paralysis. J Bone Joint Surg Am. 1963 Oct;45:1382-8.



Galeazzi Fracture - Dislocation

- 1934: Surgeon Riccardo Galeazzi
- Pattern: radial shaft fracture (middle/distal third) with associated dislocation of the distal radioulnar joint (DRUJ)
- MOI: FOOSH, forearm pronation or supination

***Rare in kids:** consider Galeazzi equivalent

- Radial shaft fx with distal ulnar physis displacement (DRUJ remains intact)

•Galeazzi R. Uber ein besonderes Syndrom bei Verletzungen im Bereich der Unterarmknochen. Archiv fur orthopadische und Unfall Chirurgie 1934; 35:557–562.

Case courtesy of Dr Alexandra Stanislavsky, Radiopaedia.org, rID: 10961

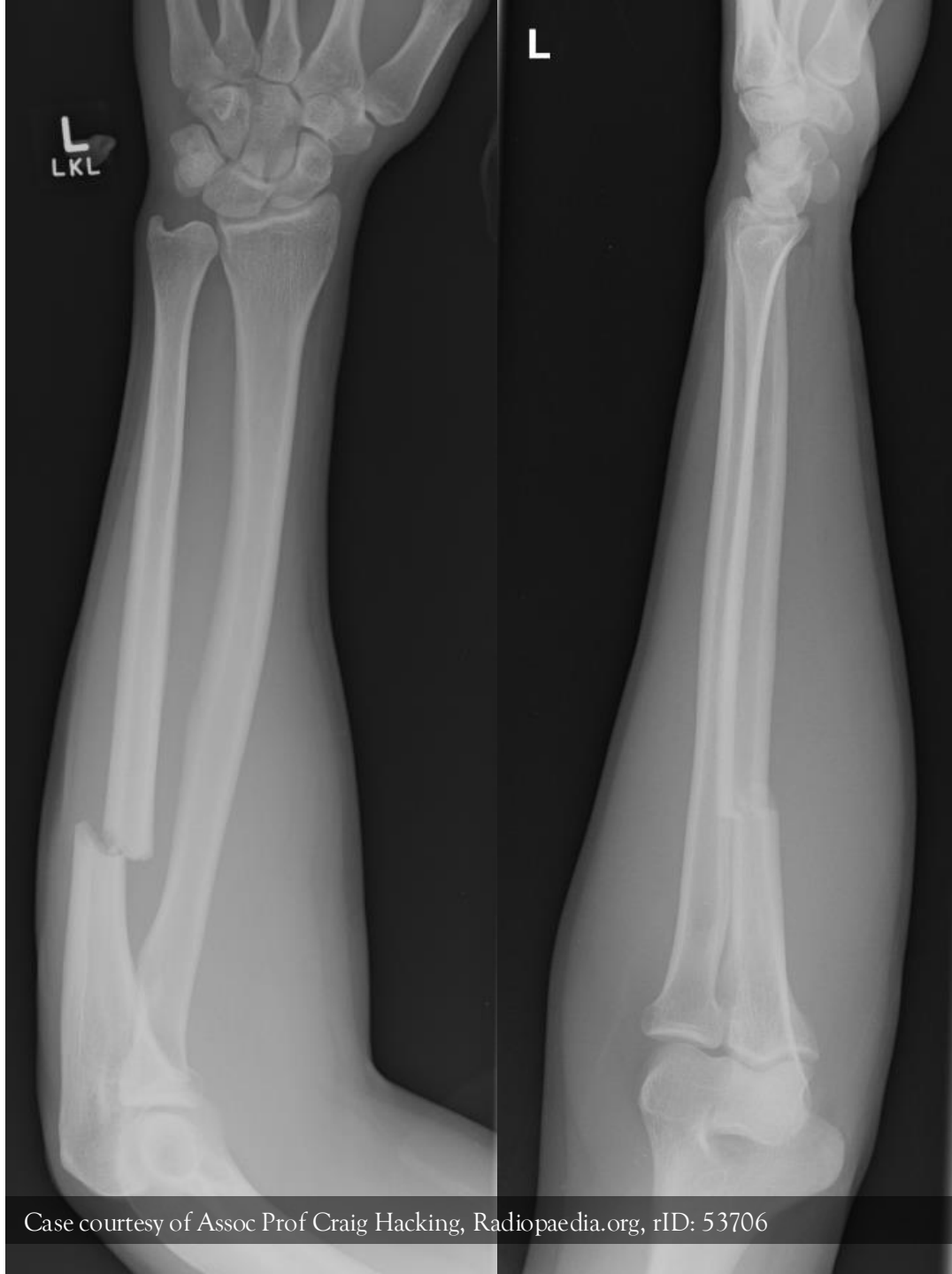

L
LKL


L

Nightstick Fracture

- Named after police baton (nightstick) impacting the midshaft of the ulna with a direct blow
- Pattern: isolated ulnar shaft fracture
  - Typically, transverse in midshaft
- MOI: direct impact of blunt object to the forearm often while attempting to block a blow to head
  - Must consider defensive wound, assault

*When "isolated" ulnar shaft fx identified, consider physical exam findings and dedicated elbow images to assess for associated injuries



Case courtesy of Assoc Prof Craig Hacking, Radiopaedia.org, rID: 53706

Monteggia Fracture - Dislocation

- 1812: Surgeon Giovanni Battista Monteggia
- Pattern: ulna shaft (proximal third/middle) fx with dislocation of radial head
- MOI: majority are FOOSH with forearm pronation or hyperextension
  - Bado classification (Type I-IV) based on pattern variability

*Missed or delayed diagnosis of radial head dislocation may lead to significant complications

- Monteggia GB. Lussazioni delle ossa delle estremita superiori. In: Monteggia GB. Instituzioni Chirurgiche. 1814; V: 131-133

Case courtesy of Assoc Prof Frank Gaillard, Radiopaedia.org, rID: 8012


R

Colles Fracture

- 1814: Surgeon Abraham Colles
- Pattern: **extra-articular** distal radius fracture with impaction and dorsal angulation/displacement
  - "dinner fork deformity"
- MOI: FOOSH or high impact trauma

*50% associated ulnar styloid fracture

Case courtesy of Townsville radiology training, Radiopaedia.org, rID: 17977

•Colles A. On the fracture of the carpal extremity of the radius. The Edinburgh medical and surgical journal. 1814;10:182-186.

Smith Fracture

- 1847: Surgeon and pathologist Robert Smith
- Pattern: transverse fracture of the distal radius with volar angulation/displacement
  - Also termed Reverse Colles
- MOI: Fall on flexed wrist

*Type I is most common which is extra-articular

Case courtesy of Dr Jan Frank Gerstenmaier, Radiopaedia.org, rID: 25199

•Smith RW. On Fractures of the Bones of the Fore-arm in the Vicinity of the Wrist Joint. In: A Treatise on Fractures in the Vicinity of Joint and on Certain Forms of Accidental and Congenital Dislocations. Dublin. 1847: 129-175.

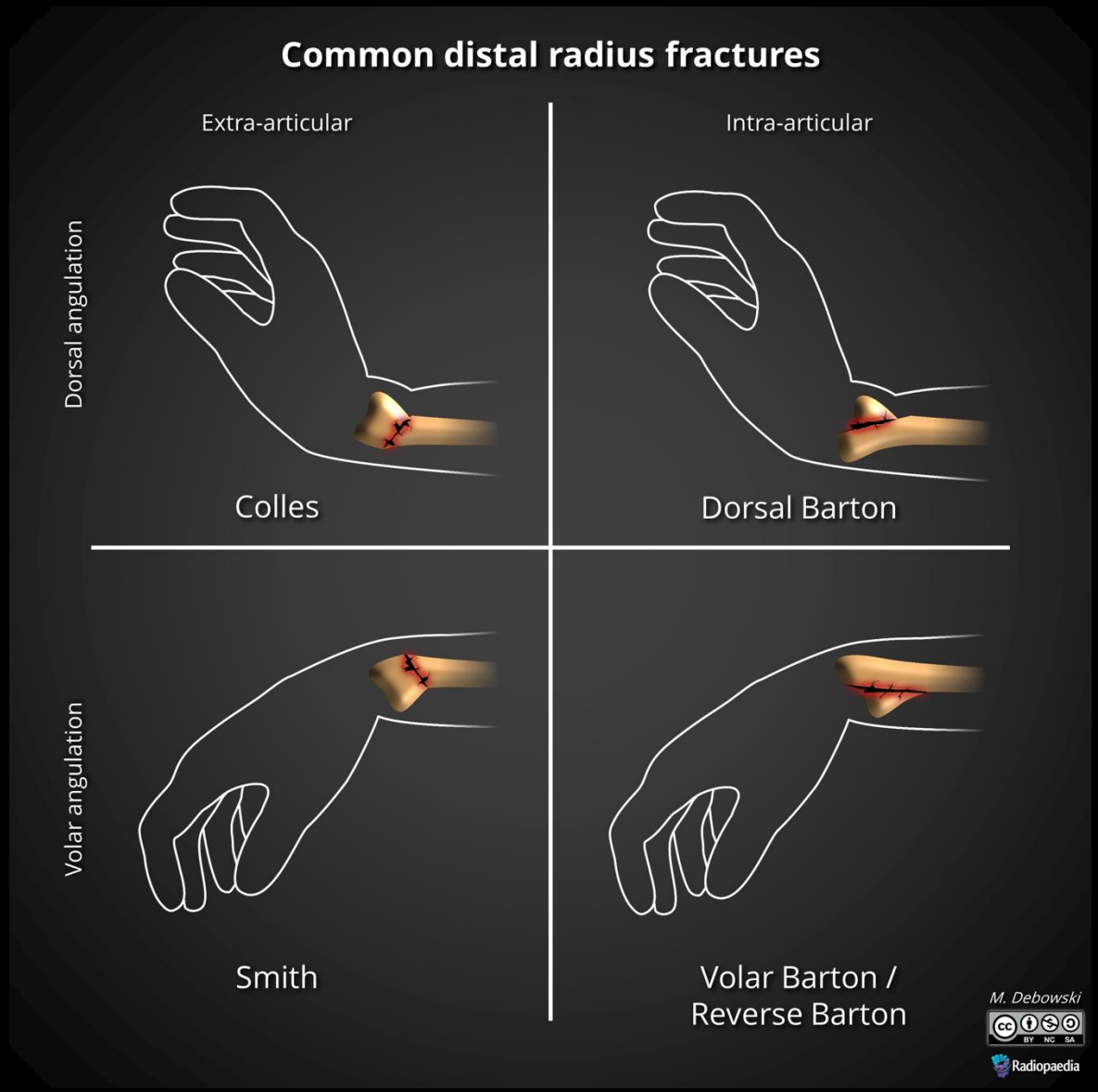
Barton Fracture

- 1838: Surgeon John Rhea Barton
  - Eponym applied in 1860
- Pattern: oblique fracture of the distal radius with articular extension dorsally
  - Dorsal-type: Barton fracture
  - Volar-type: reverse Barton fracture

*Often associated with dorsal subluxation/dislocation of radiocarpal joint

Barton, JR. Views and treatment of an important injury of the wrist. Medical Examiner. 1838; 1: 365–368.

Case courtesy of Dr Aditya Shetty, Radiopaedia.org, rID: 28755



Case courtesy of Dr Maciej Debowski, Radiopaedia.org, rID: 66146

Case courtesy of Dr Alexandra Stanislavsky, Radiopaedia.org, rID: 12360

Chauffeur Fracture

- Also known as Hutchinson or Backfire
  - 1866: Surgeon Johnathan Hutchinson
  - Named for injury sustained when using a hand crank and it unexpectantly jerked back impacting wrist
  - Pattern: intra-articular oblique fracture of radial styloid process
    - Scaphoid impacts radius
  - MOI: direct trauma to dorsum of wrist or FOOSH

*May be considered avulsion fracture as the radiocarpal ligaments remain attached to styloid

Bennett Fracture

- 1881: Surgeon Edward Bennett
- Pattern: intra-articular oblique fracture at the base of the first metacarpal
  - Associated with subluxation or dislocation of carpometacarpal joint
- MOI: axial trauma with partially flexed metacarpal

*Two-part fracture

Case courtesy of eduardo bravo, Radiopaedia.org, rID: 55586

•Bennett EH. Fractures of the metacarpal bones. Dublin J Med Sci 1882; 73: 72-75

Rolando Fracture

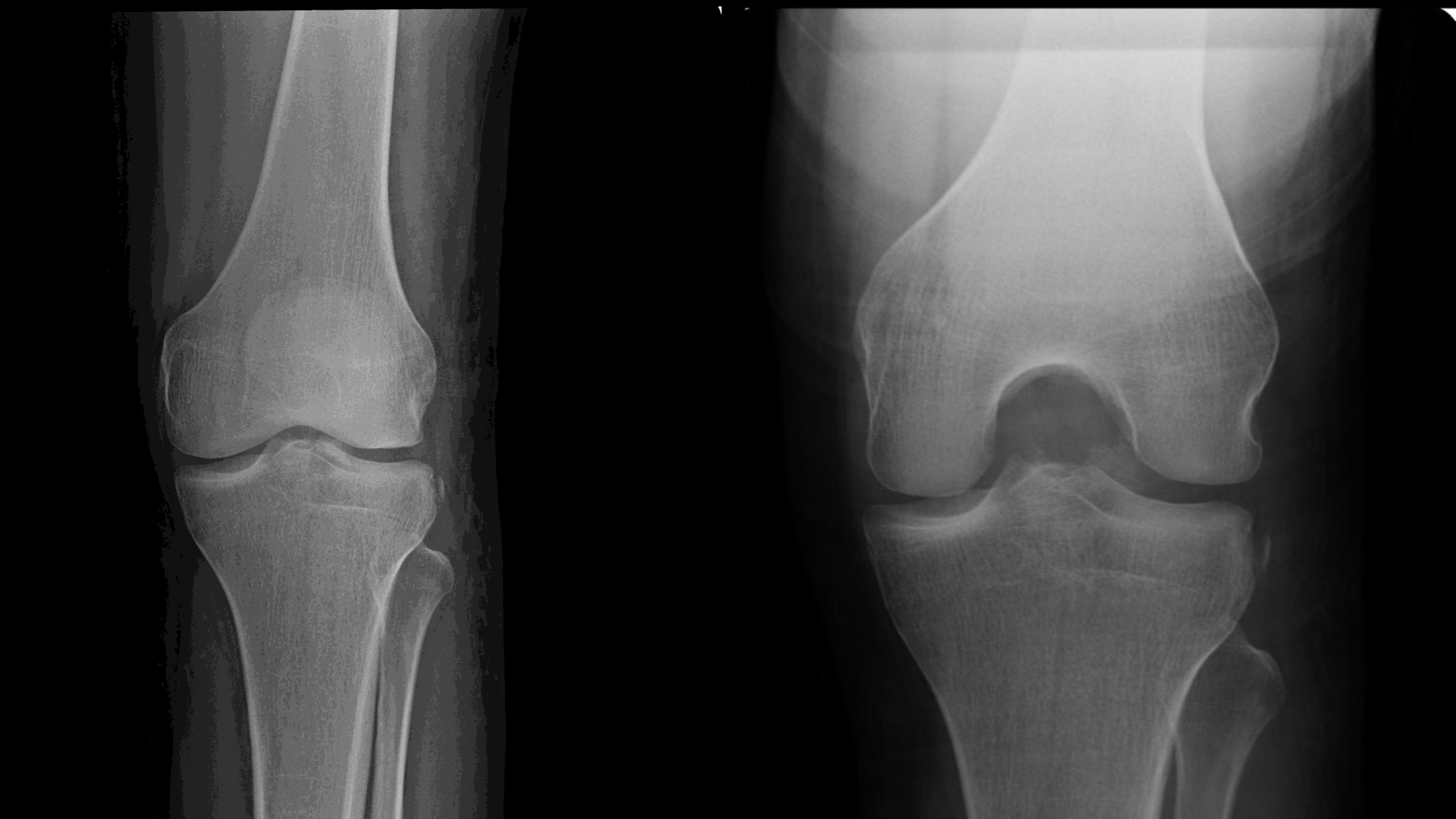
- 1910: Silvio Rolando
- Pattern: comminuted intra-articular first metacarpal base fracture
  - ≥3 parts, T or Y shaped
- MOI: axial trauma with partially flexed metacarpal

* "Comminuted Bennett Fx": unstable fx

Case courtesy of Dr Maulik S Patel, Radiopaedia.org, rID: 48712

•Rolando S. Fracture de la base du premier metacarpien et principalement sur une variété non encore décrite. La Presse Médicale 1910; 33: 303–304. [Translated Meals RA. Fracture of the base of the first metacarpal and a variation that has not yet been described. Clin Orthop Relat Res. 2006 Apr;445:15-8]

LOWER EXTREMITY EPONYMOUS FRACTURES



Case courtesy of Dr Maulik S Patel, Radiopaedia.org, rID: 9758

Segond Fracture

- 1879: Surgeon Paul Segond
- Pattern: avulsion fracture of the proximal lateral tibia (inferior to the tibial plateau)
- MOI: internal rotation of the knee with varus stress

*Frequent association with **ACL tears**, meniscal tears, and other soft tissue injuries

•Segond P. Recherches cliniques et expérimentales sur les épanchements sanguins du genou par entorse. Progrès Médical 1879; 16: 297–299, 319–321, 340–341


R


R
Horizontal Beam

Maisonneuve Fracture

- 1840: Surgeon Jacque Gilles Maisonneuve
- Pattern: spiral fracture of the proximal fibula with associated unstable ankle injury
  - Disruption of the distal tibiofibular syndesmosis +/- medial malleolus fx, and interosseous tear
  - May have widening at ankle mortise
- MOI: force on externally rotated ankle with a pronated foot

*Always assess proximal fibula with ankle injuries to avoid missing this injury

•Maisonneuve JG. Recherches sur la fracture du péroné. Archives générales de médecine **1840**; 7: 165-187 and 433-473

Case courtesy of RMH Core Conditions, Radiopaedia.org, rID: 29088


R

Tillaux Fracture

- 1872: Paul Tillaux
- Pattern: fracture of the anterolateral tubercle of the distal tibia
- MOI: pull of the anteroinferior tibiofibular ligament in abduction/external rotation
  - Fracture requires an open physis: Adolescent injury

*Salter-Harris Type III

Case courtesy of Dr Balint Botz, Radiopaedia.org, rID: 74925


L

Triplane Fx

- Name reflects the injury extending along the frontal, lateral, and transverse planes

- Pattern: SH IV fracture of the distal tibia
  - Epiphysis: vertical fx
  - Physis: horizonal fx
  - Metaphysis: oblique fx
- MOI: External rotation and supination injury in adolescents as epiphyseal plate is closing

*Fractures appear as a SH III on AP view and SH II on lateral view.

Case courtesy of Dr Yasser Asiri, Radiopaedia.org, rID: 64779

Jones Fracture

- 1902: Orthopaedic surgeon Sir Robert Jones
  - Sustained this injury while dancing
- Pattern: transverse fracture at the metadiaphyseal junction without articular extension
  - Pseudo-Jones: avulsion fracture of the fifth metatarsal base
- MOI: plantarflexion with adduction force to forefoot

*Higher rate of nonunion, delayed union, or refracture due to limited blood supply

•Jones R. Fracture of the Base of the Fifth Metatarsal Bone by Indirect Violence. Ann Surg. 1902; 35(6): 697–700

Case courtesy of Dr Matt Skalski, Radiopaedia.org, rID: 35716


QUICK COMPARISONS

Colles

Barton

Bennett

Rolando

Jones

Pseudo-Jones

Apophysis

Night Stick

Monteggia

Final Tips

1

Correlate with clinical findings

2

Document potential associated injuries

3

Describing a fracture is far more important than the unique name!

Questions?

References

1. Espinosa JA, Nolan TW. Reducing errors made by emergency physicians in interpreting radiographs: longitudinal study. BMJ. 2000;320(7237):737-740.
2. Eng J, Mysko WK, Weller GE, et al. Interpretation of emergency department radiographs a comparison of emergency medicine physicians with radiologists, residents with faculty, and film with digital display. AJR AM J Roentgenol. 2000;175:1233-1238.
3. Bolander, S. A systematic approach to describing fractures. JAAPA. 2019;32(5):23-29.
4. Martin J, Marsh JL, Nepola JV, Dirchl DR, Hurwitz S, DeCoster TA. Radiographic fracture assessments: which ones can we reliably make? J Orthop Trauma. 2000;14(6):379-385.
5. Nguyen JC, Markhardy BK, Merrow AC, Dwek JR. Imaging of pediatric growth plate disturbances. Radiographics. 2017;37(6):1791-1812.
6. Wong PK, Hanna TN, Shuaib W, et al. What's in a name? Upper extremity fracture eponyms (part 1). Int J Emerg. 2015;8:27.
7. Wong PK, Hanna TN, Shuaib W, et al. What's in a name? Lower extremity fracture eponyms (part 2). Int J Emerg. 2015;8:25.

*Historical references included on slides

Resources

- AAOS: http://www.aaos.org/
- POSNA: https://posna.org/
- AAFP: http://www.aafp.org/

- Radiopaedia: http://radiopaedia.org/
- OrthoBullets: https://www.orthobullets.com