Elbow/Forearm

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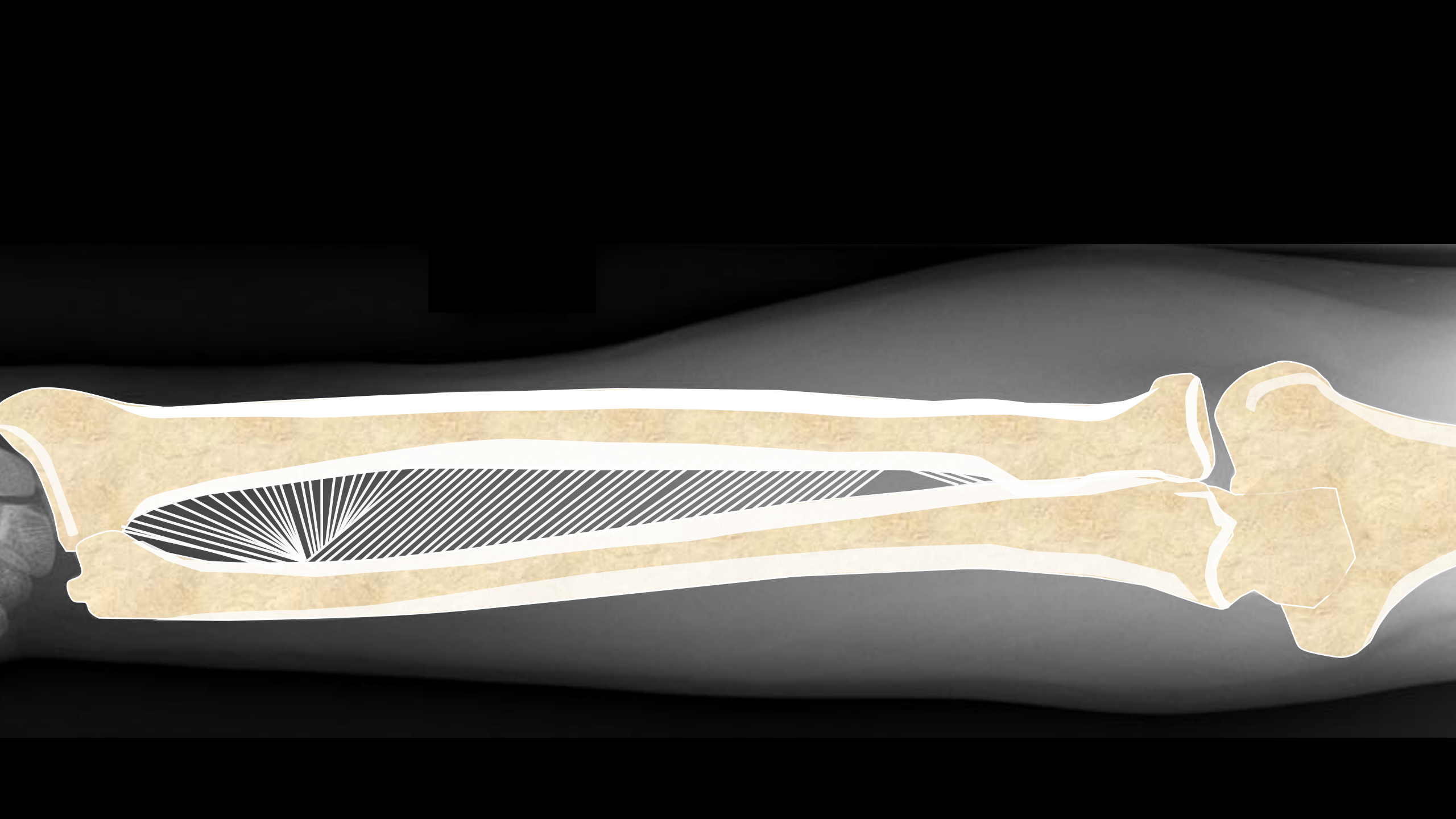
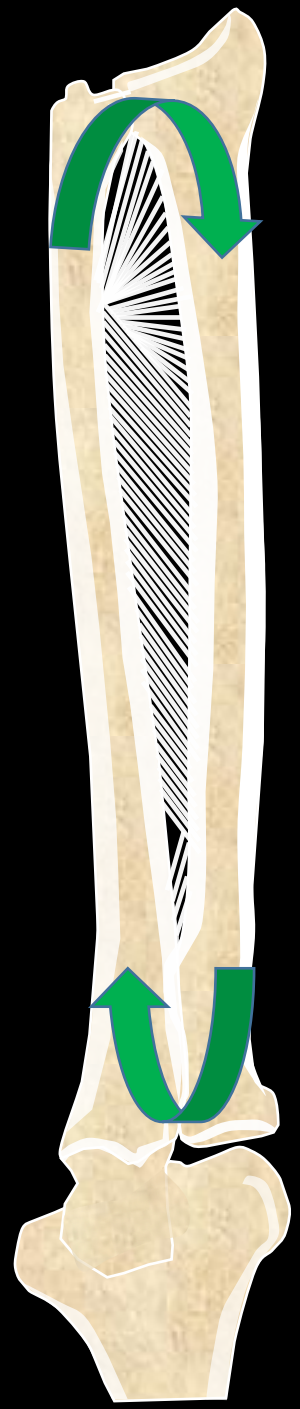
Objectives

- Elbow dislocations: the terrible triad and what the surgeon needs to know
  - Coronoid process fractures
  - Radial head fractures

- Forearm
  - Expect the pretzel

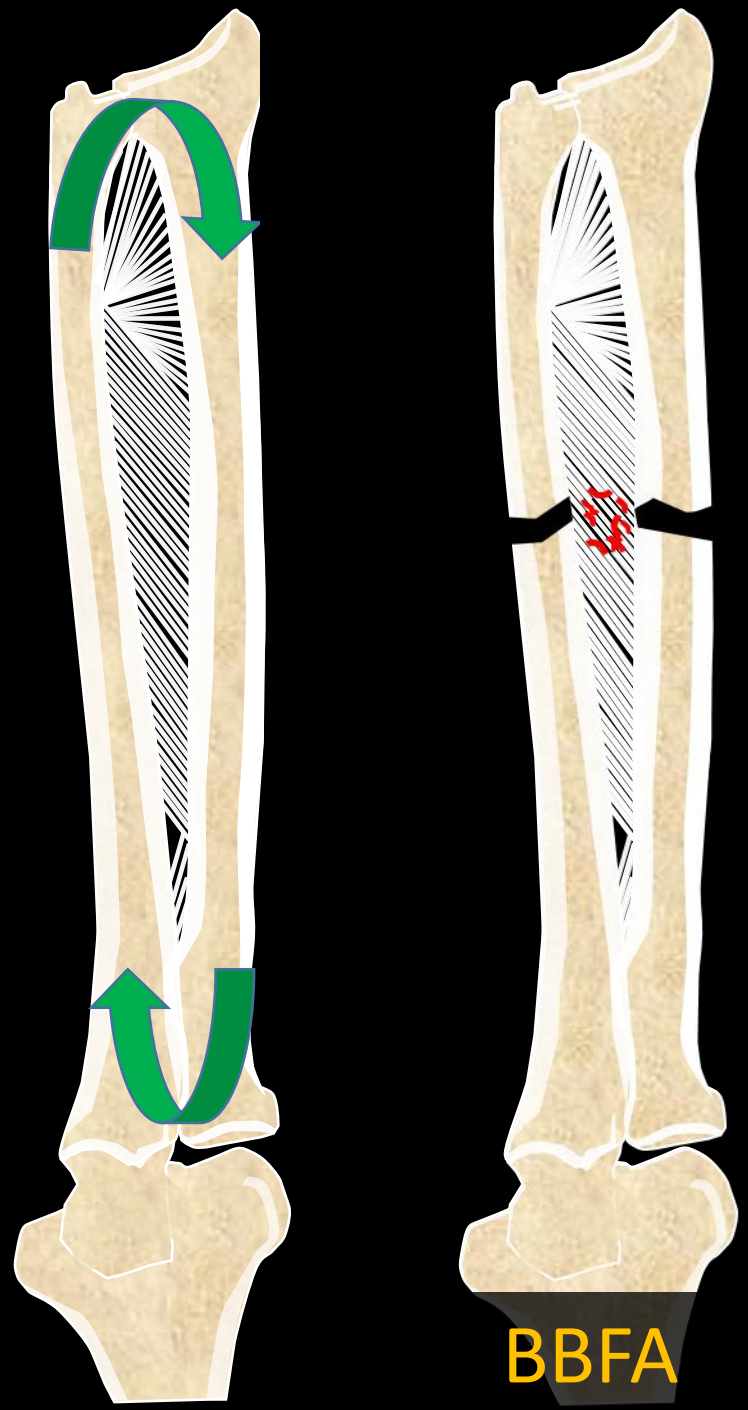




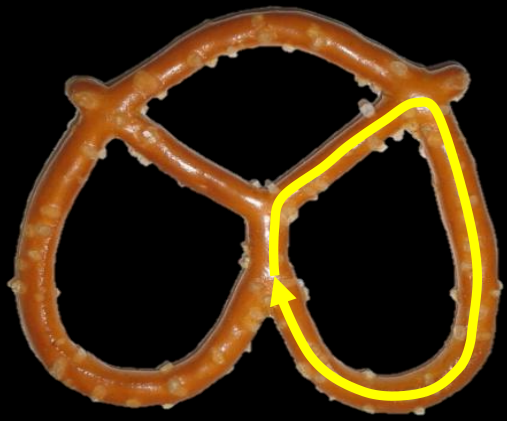
The Power of 2

Night stick fracture

But in general….



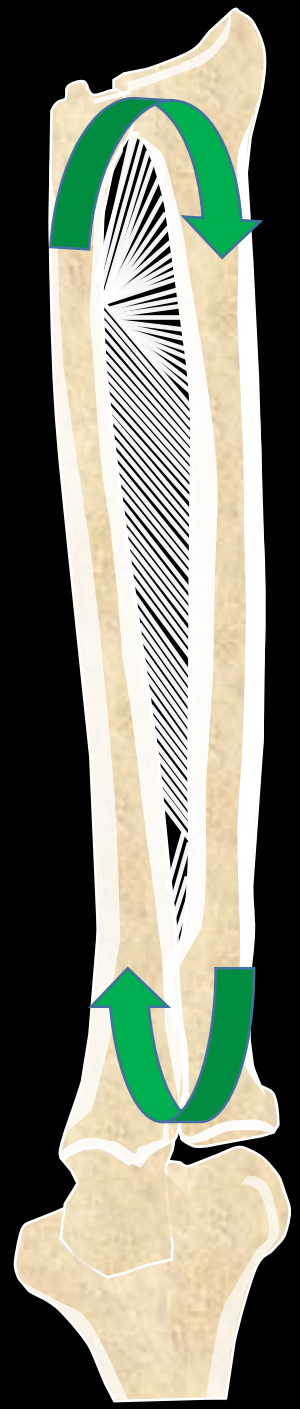
BBFA

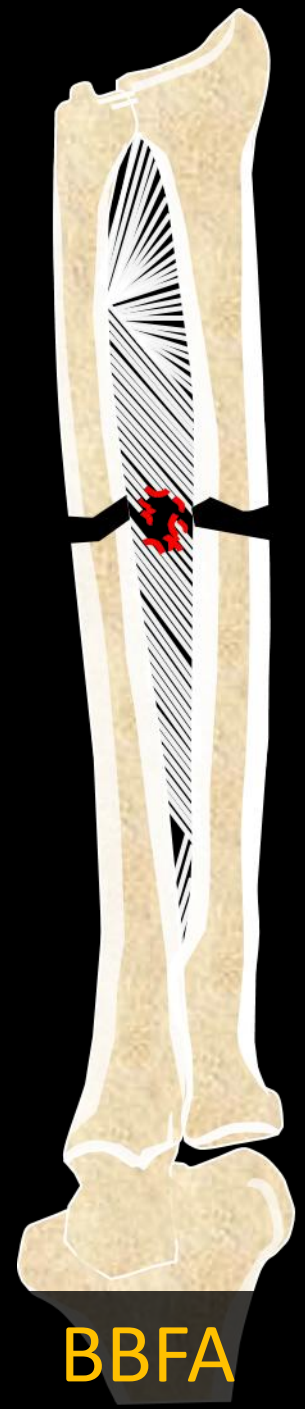


BBFA = both bone forearm frx

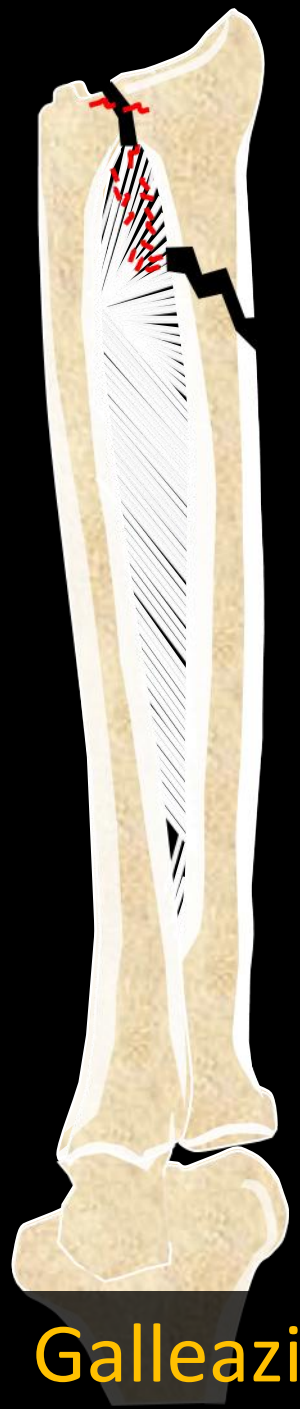
Think about:

- Median nerve injury
- Radial/ulnar artery injury
- Fragility fracture





BBFA



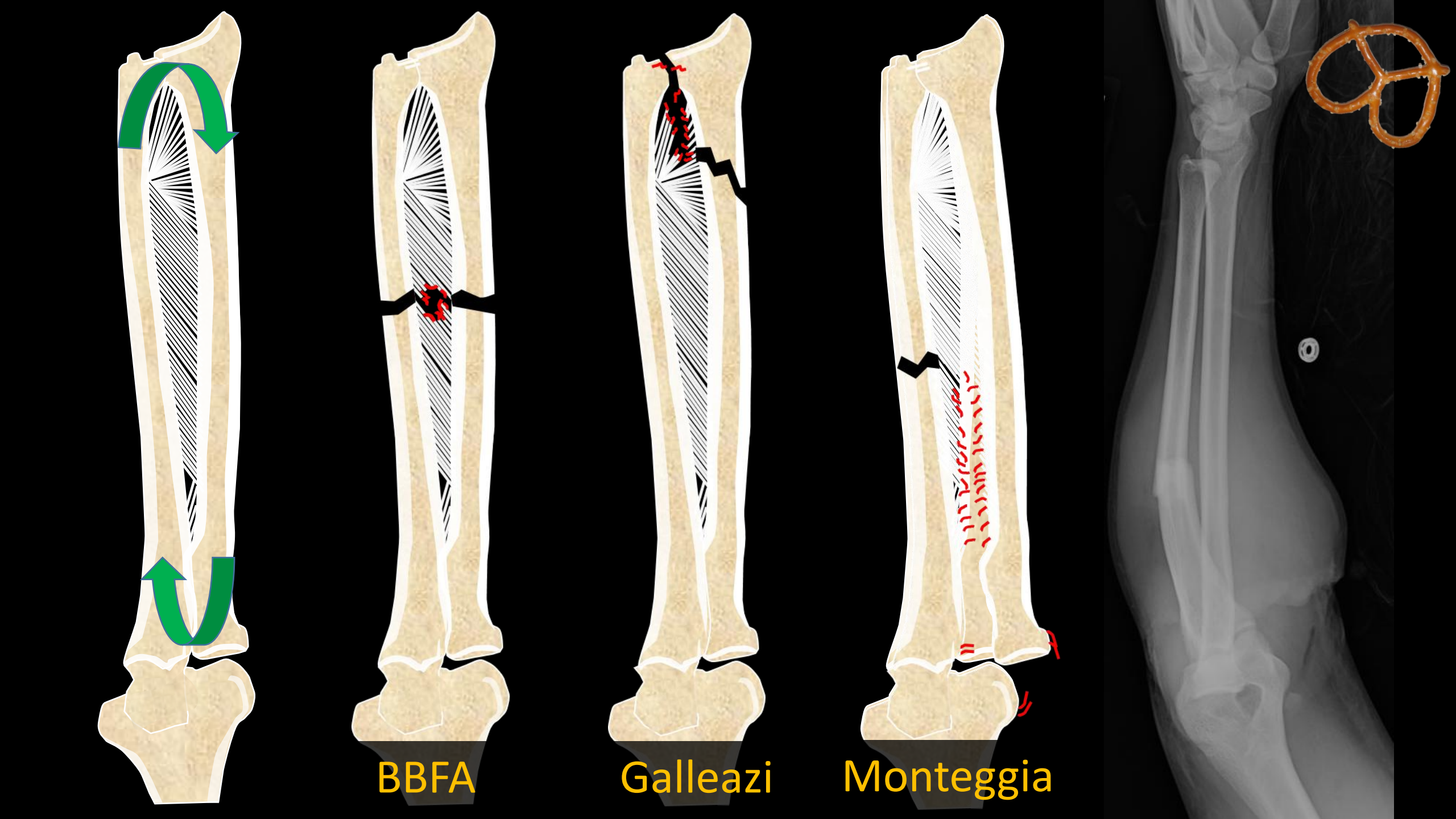
Galleazi

Galleazi fractures

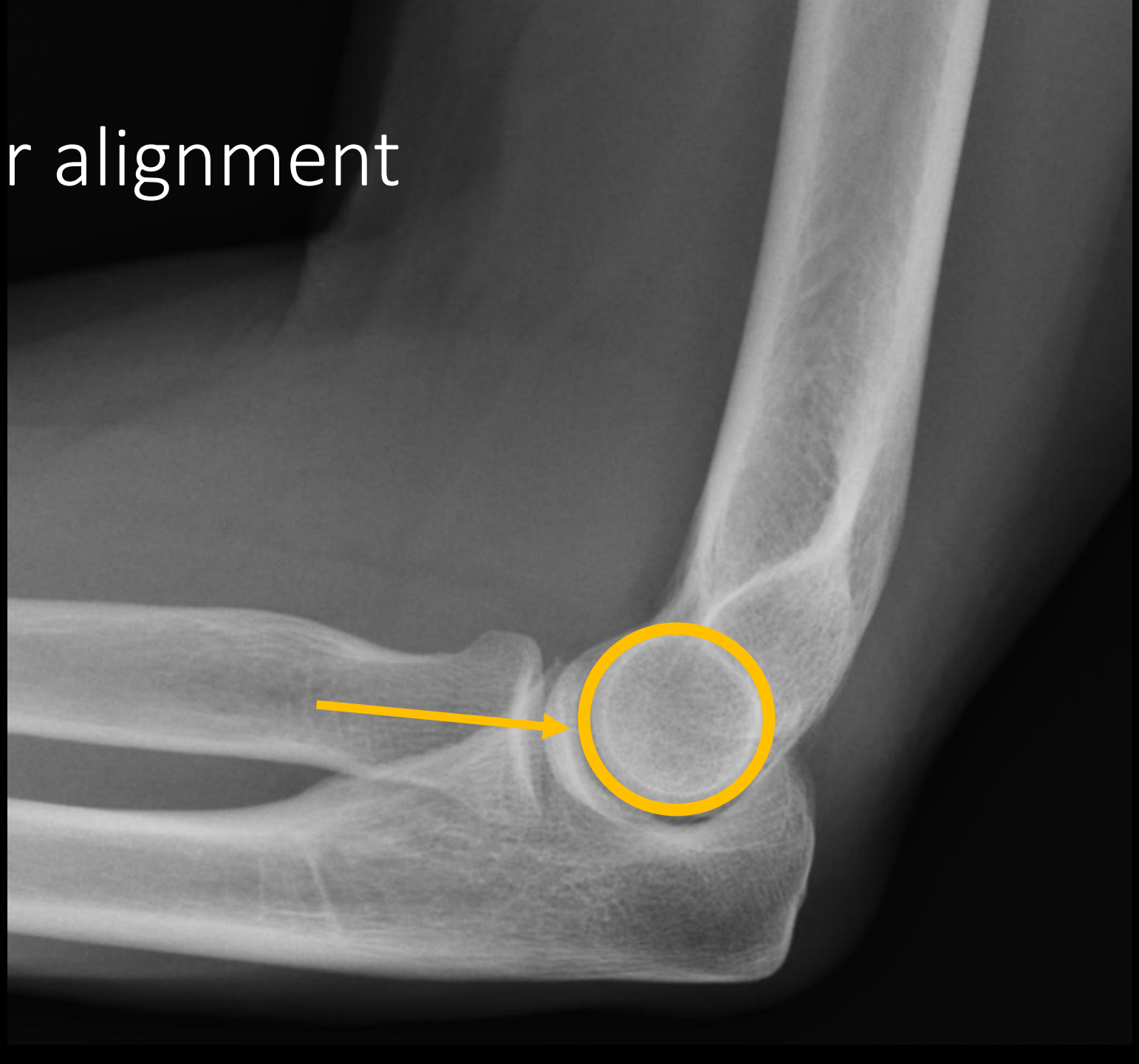
Distal 1/3rd radius and the distal radioulnar joint (DRUJ)

DRUJ injury may be subtle, particularly in a pt already casted elsewhere.

A high level of suspicion is needed


BBFA
Galleazi
Monteggia

Radiocapitellar alignment

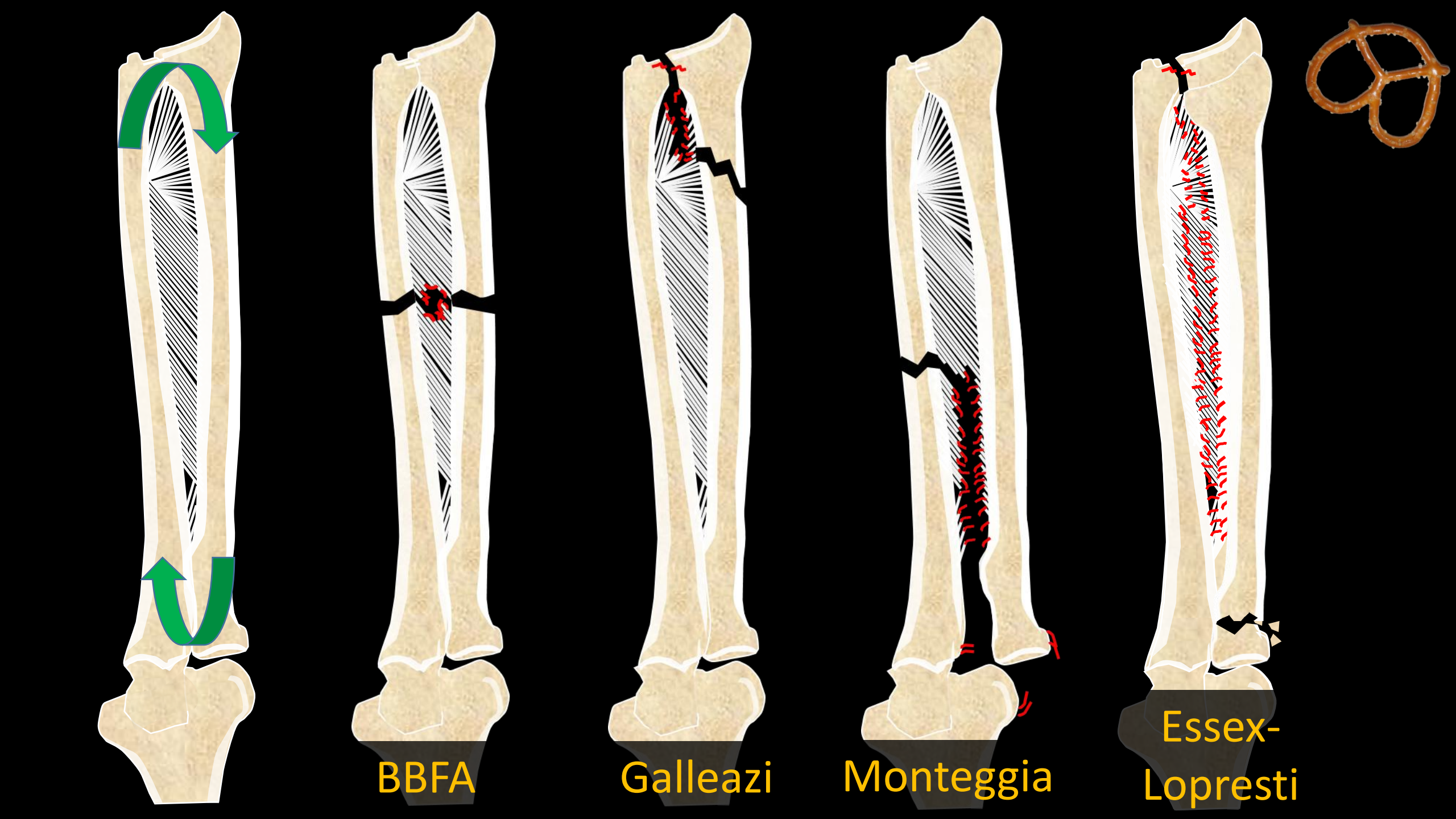


Monteggia fractures

Proximal 1/3rd radius and radiocapitellar dislocation

Anterior dislocation of the radial head more common in children, posterior more common in adults

May be associated with other injuries, including olecranon fx and “terrible triad”


BBFA
Galleazi
Monteggia
Essex-
Lopresti

Essex-Lopresti fractures

Radial head +/- neck , DRUJ dislocation, rupture of IO membrane

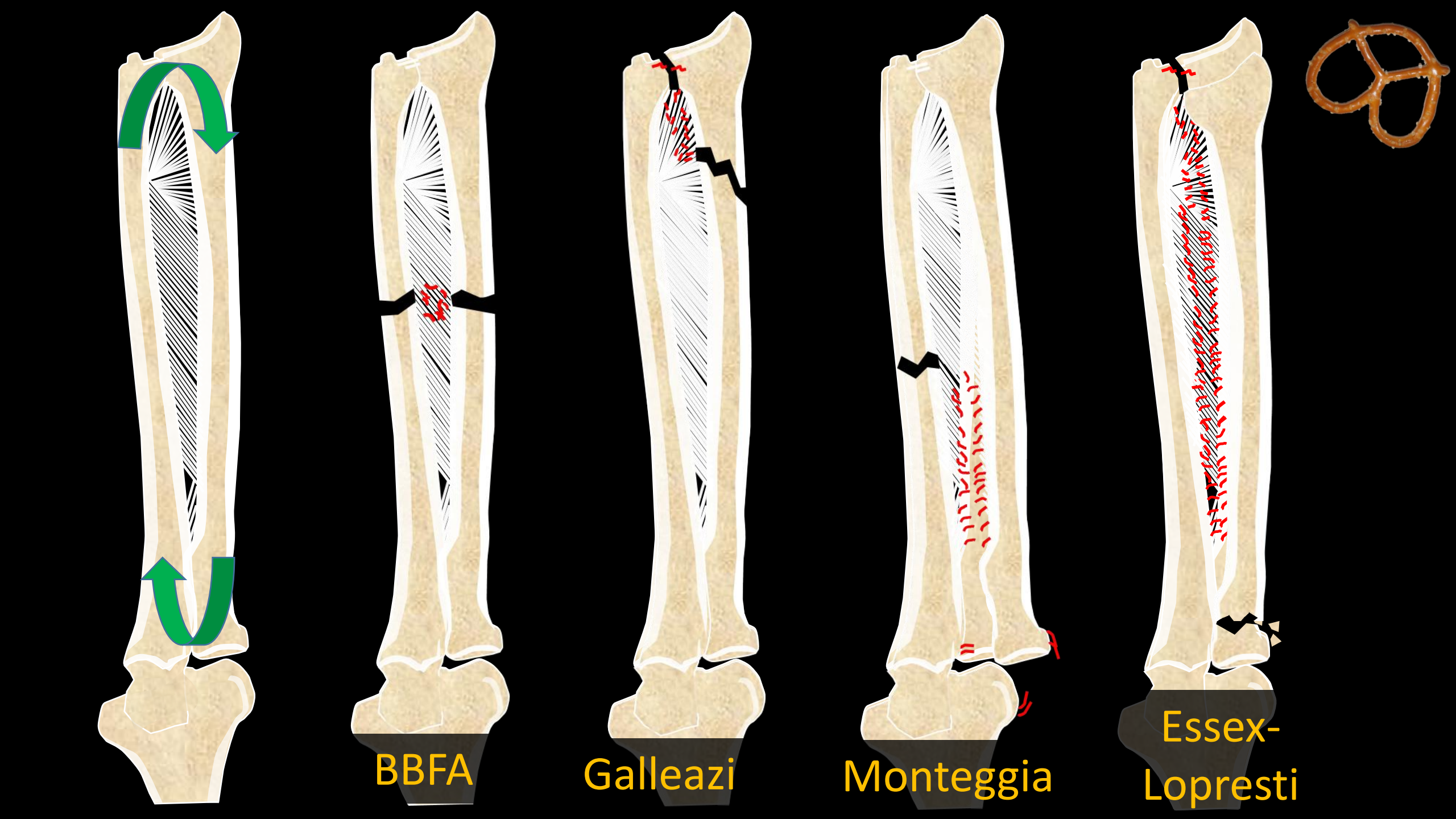
This one is a particular problem, because radial head fractures are common

Delayed diagnosis of the wrist injury can result in permanent stiffness and disability

Resection of the comminuted radial head fragment to treat the radial head frx will result in proximal migration of the radius


R
38


R
25


BBFA
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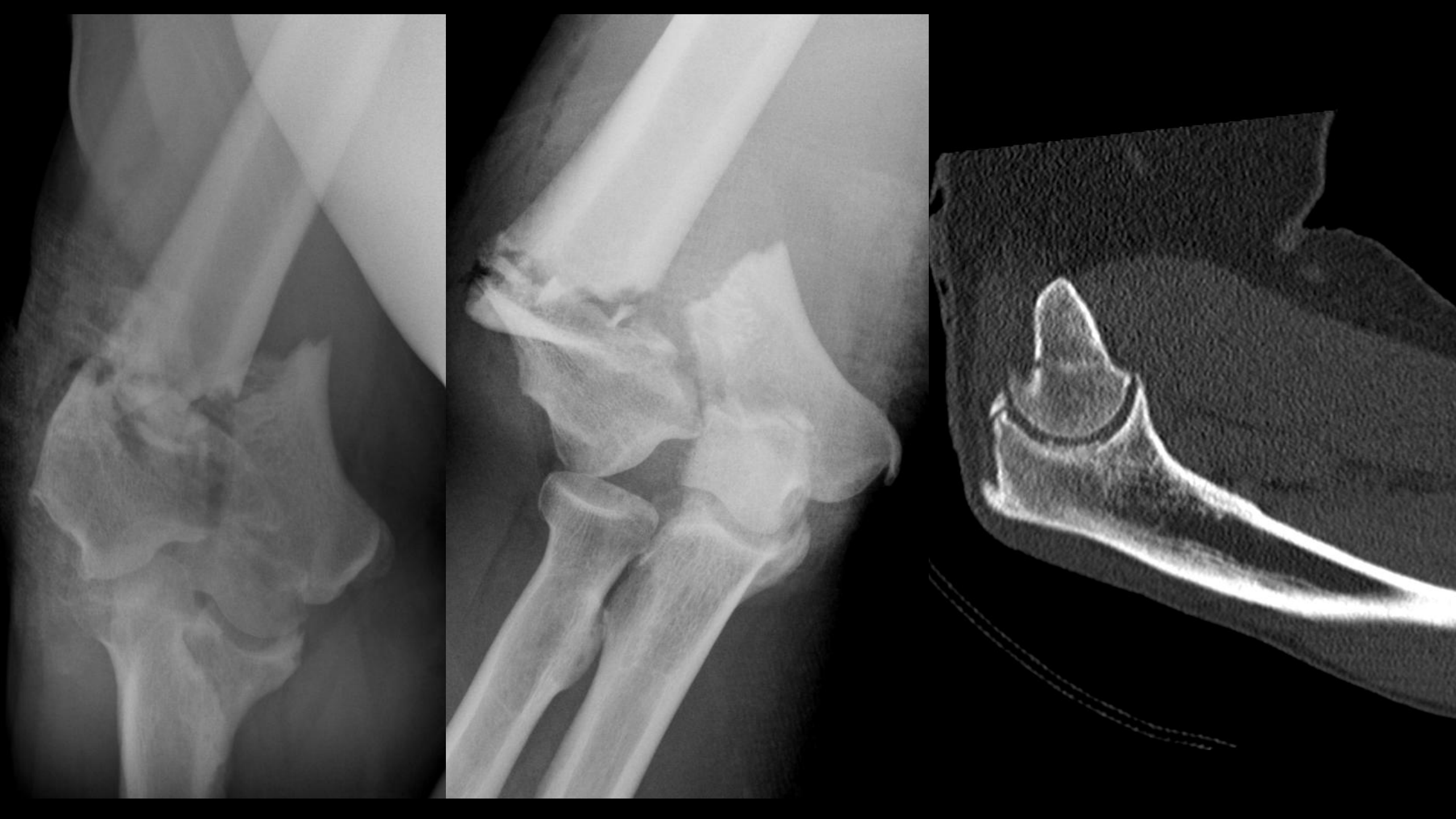
There’s one more


R
cm

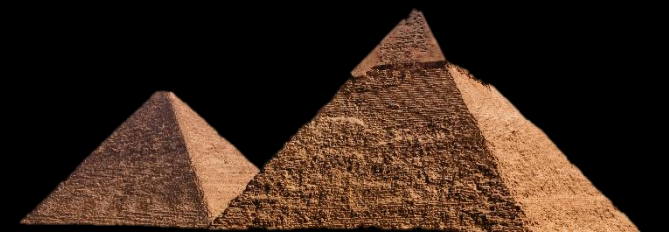

A word to the wise…or
beware the pitfall



Olecranon osteotomy – used for adequate exposure of the joint for repair of intra-articular elbow fractures

Elbow dislocations and the “terrible triad”

- Radial head fracture
- Coronoid process fracture
- Medial ligamentous instability



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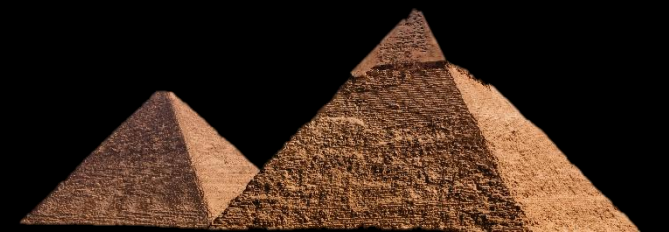

Radial head fracture:

- Displacement (>2mm?)
- Comminution
- Associated radial neck fracture
- Associated dislocation

Partial articular or complete

Ruchelsman, DE, Christoforou D, Jupiter Jb. Fractures of the Radial Head and Neck. J Bone Joint Surg Am, 2013: 95: 469-78

Radial head fracture:

Partial articular or complete

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Radial head fracture:

Partial articular or complete

% articular surface involvement

Ruchelsman, DE, Christoforou D, Jupiter Jb. Fractures of the Radial Head and Neck. J Bone Joint Surg Am, 2013: 95: 469-78

Radial head fracture:

≥ 3 gets arthroplast‘ee’

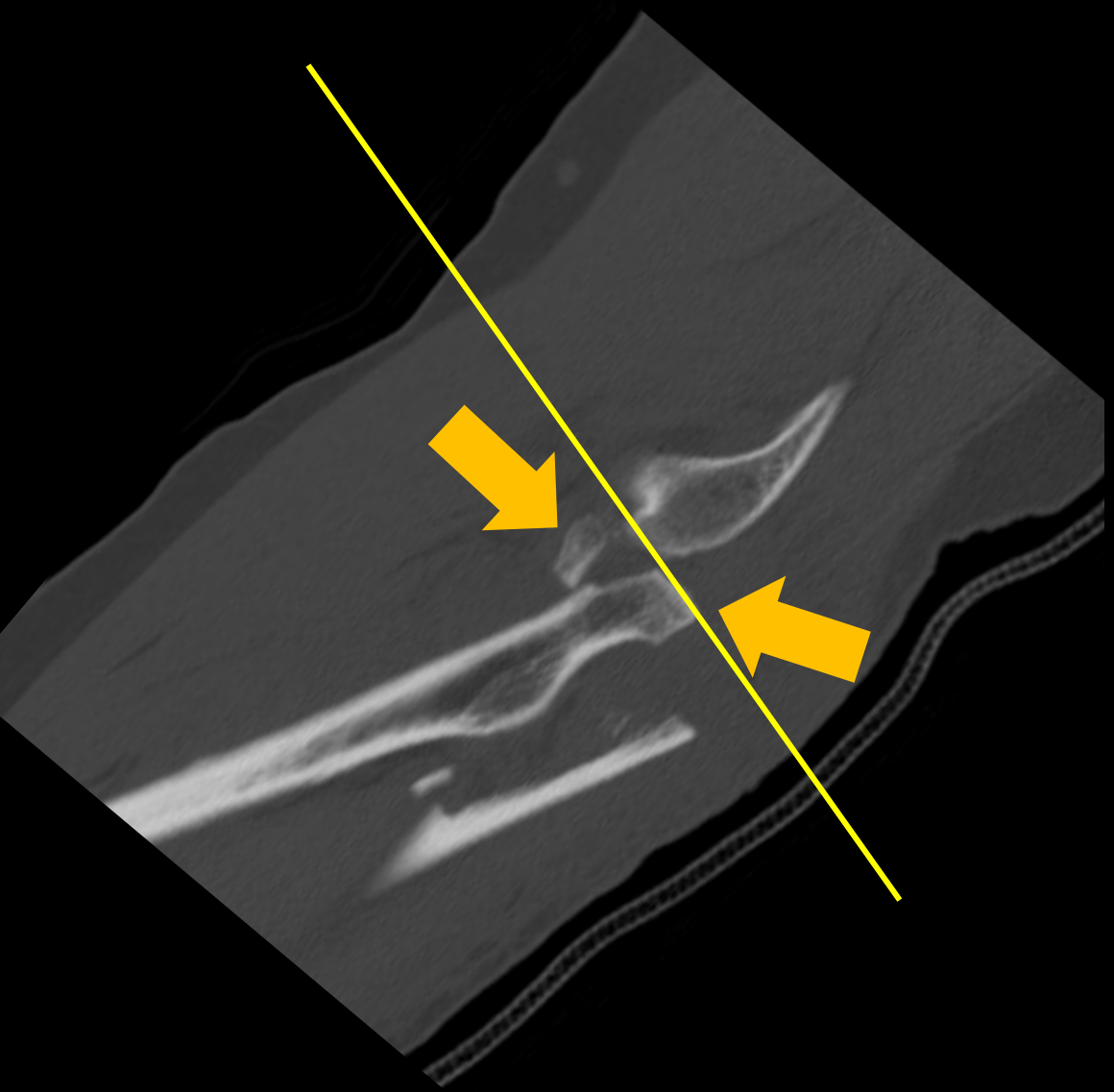
Partial articular or complete

% articular surface involvement

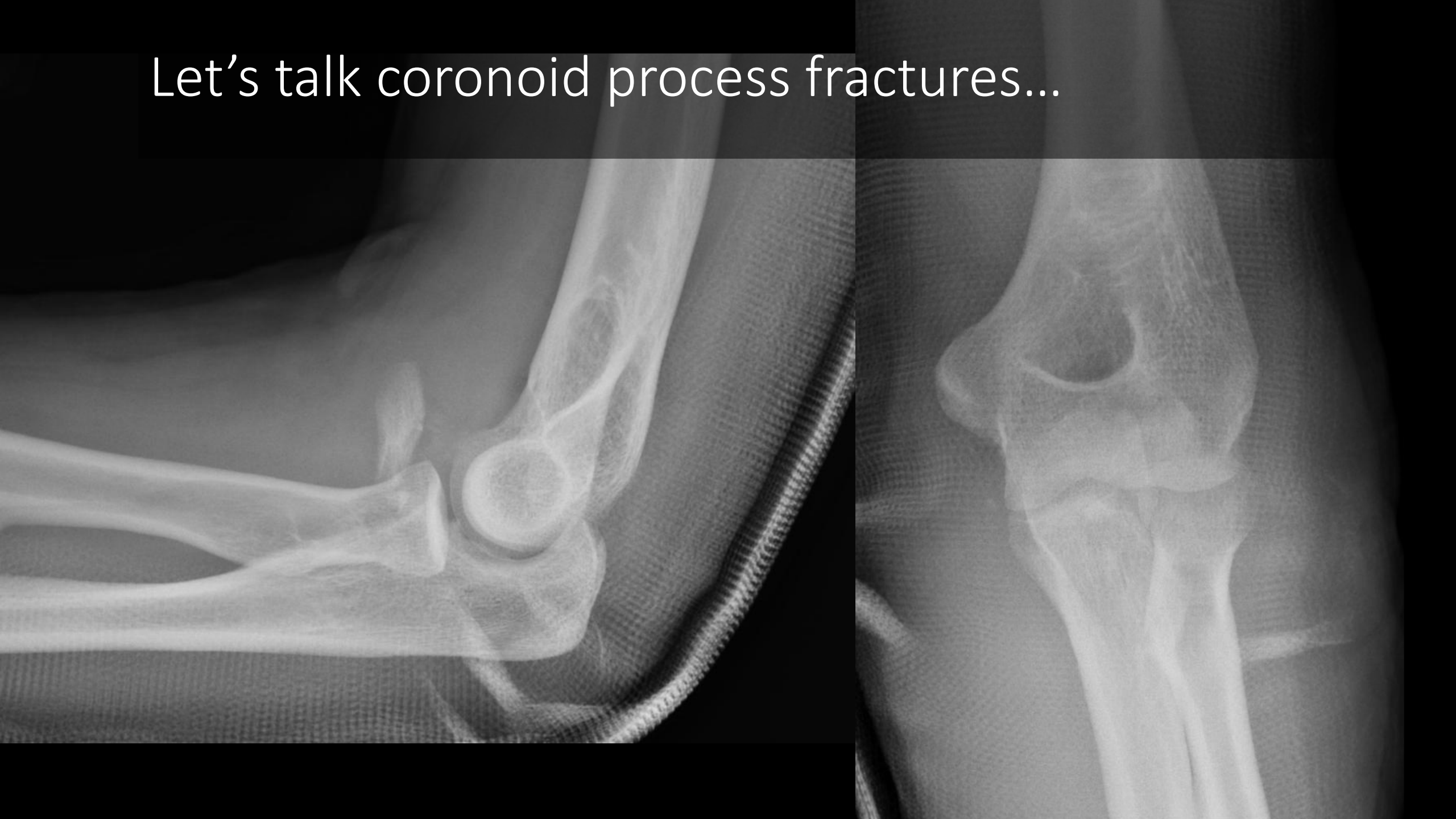
articular surface fragments

Ruchelsman, DE, Christoforou D, Jupiter Jb. Fractures of the Radial Head and Neck. J Bone Joint Surg Am, 2013: 95: 469-78

Cases



Let’s talk coronoid process fractures…



Coronoid process fracture classification options

Regan and Morrey classification

Type I: tip fracture

Type II: ≤50%

Type III: >50%

O'Driscoll classification

Tip:

1. ≤2mm of coronoid height
2. >2mm of coronoid height

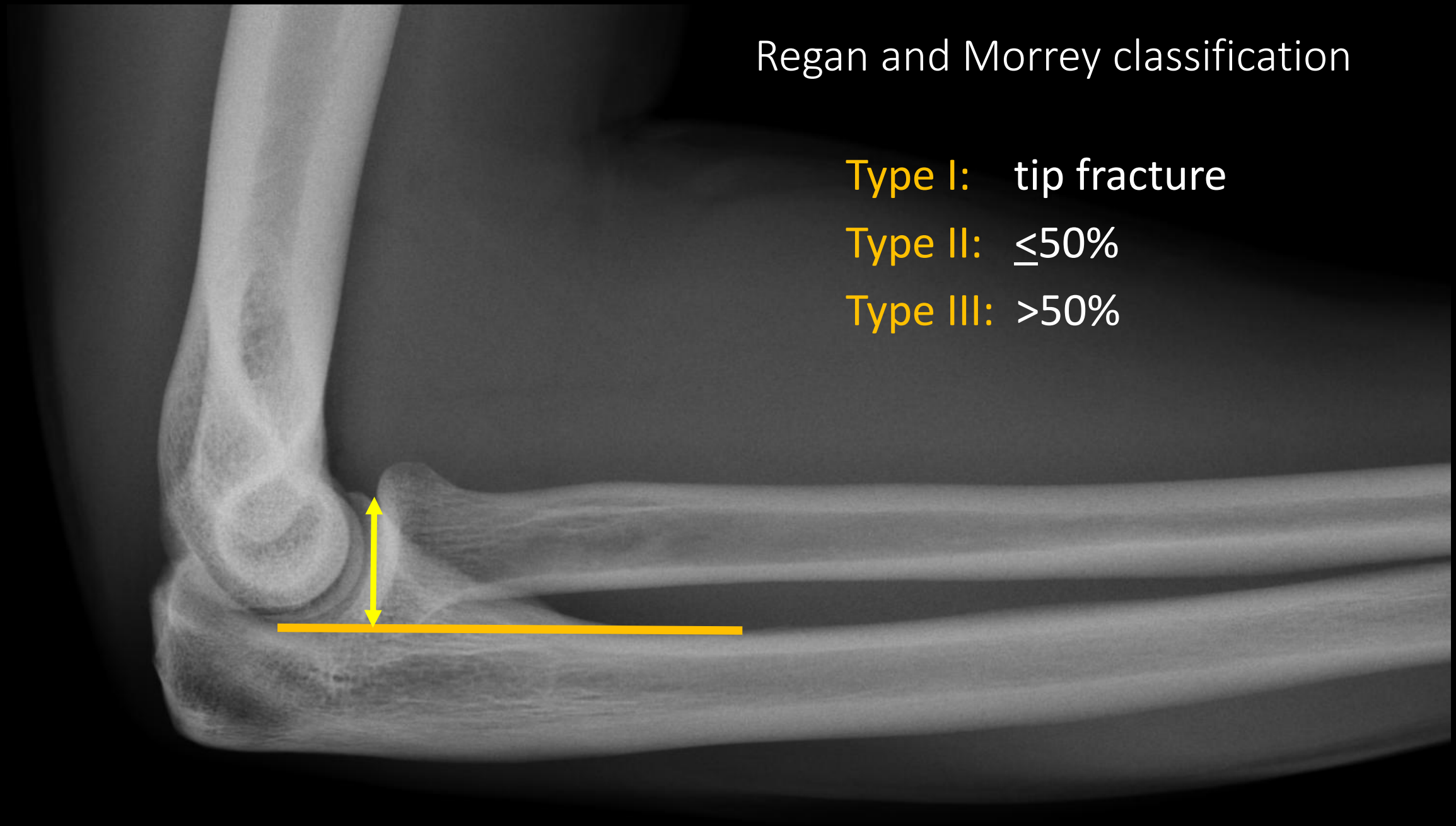
Anteromedial:

1. Anteromedial rim
2. Anteromedial rim + tip
3. Anteromedial rim + sublime tubercle

Base:

1. Involving body and base
2. Transolecranon basal fracture

Regan and Morrey classification



Type I: tip fracture

Type II: ≤50%

Type III: >50%

Coronoid process fracture classification options

Regan and Morrey classification

Type I: tip fracture

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Type III: >50%

But of course the surgeons are using this one (impacts management more)

O'Driscoll classification

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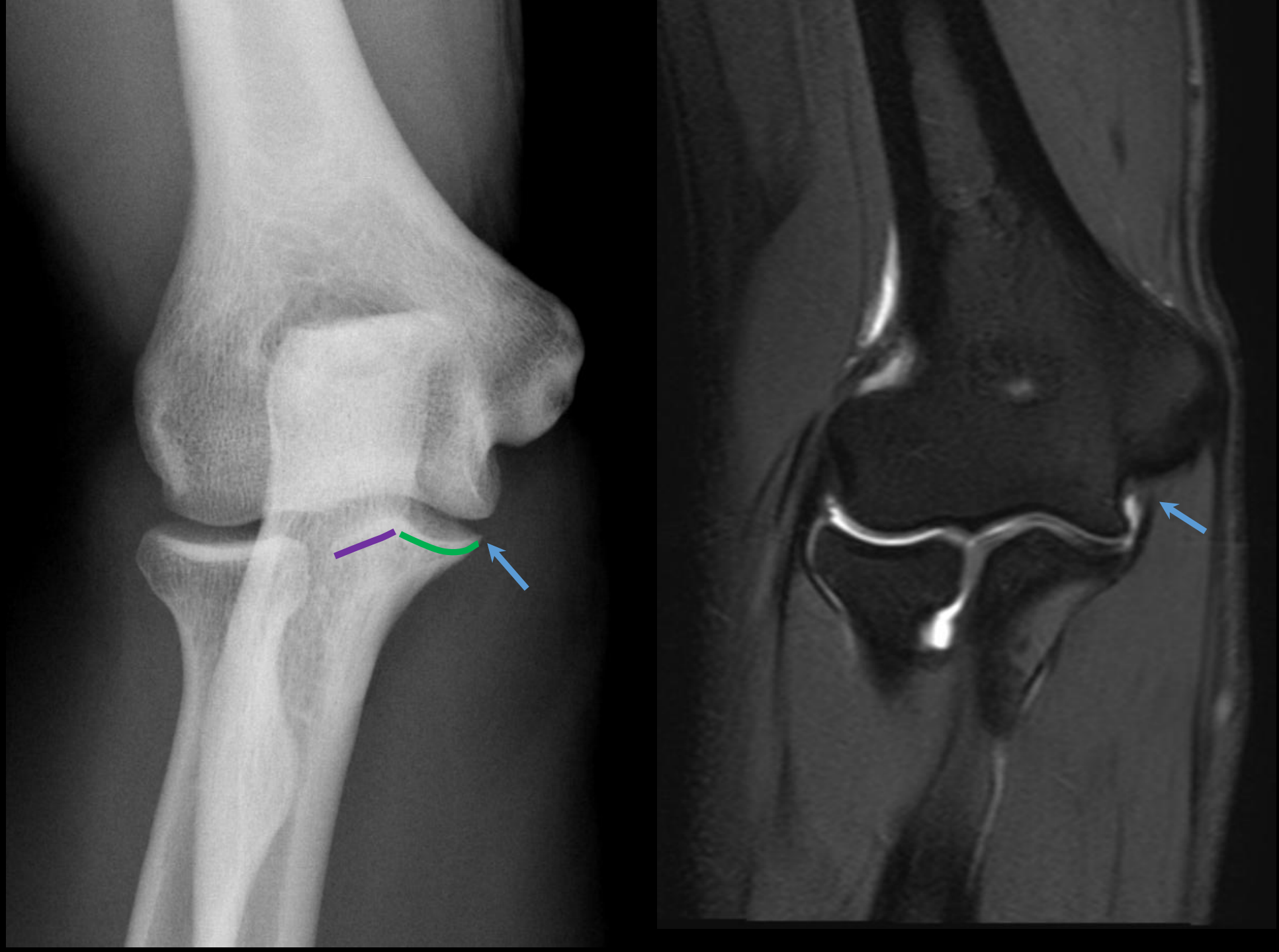
Ever noticed that the coronoid process isn’t a smooth arc?

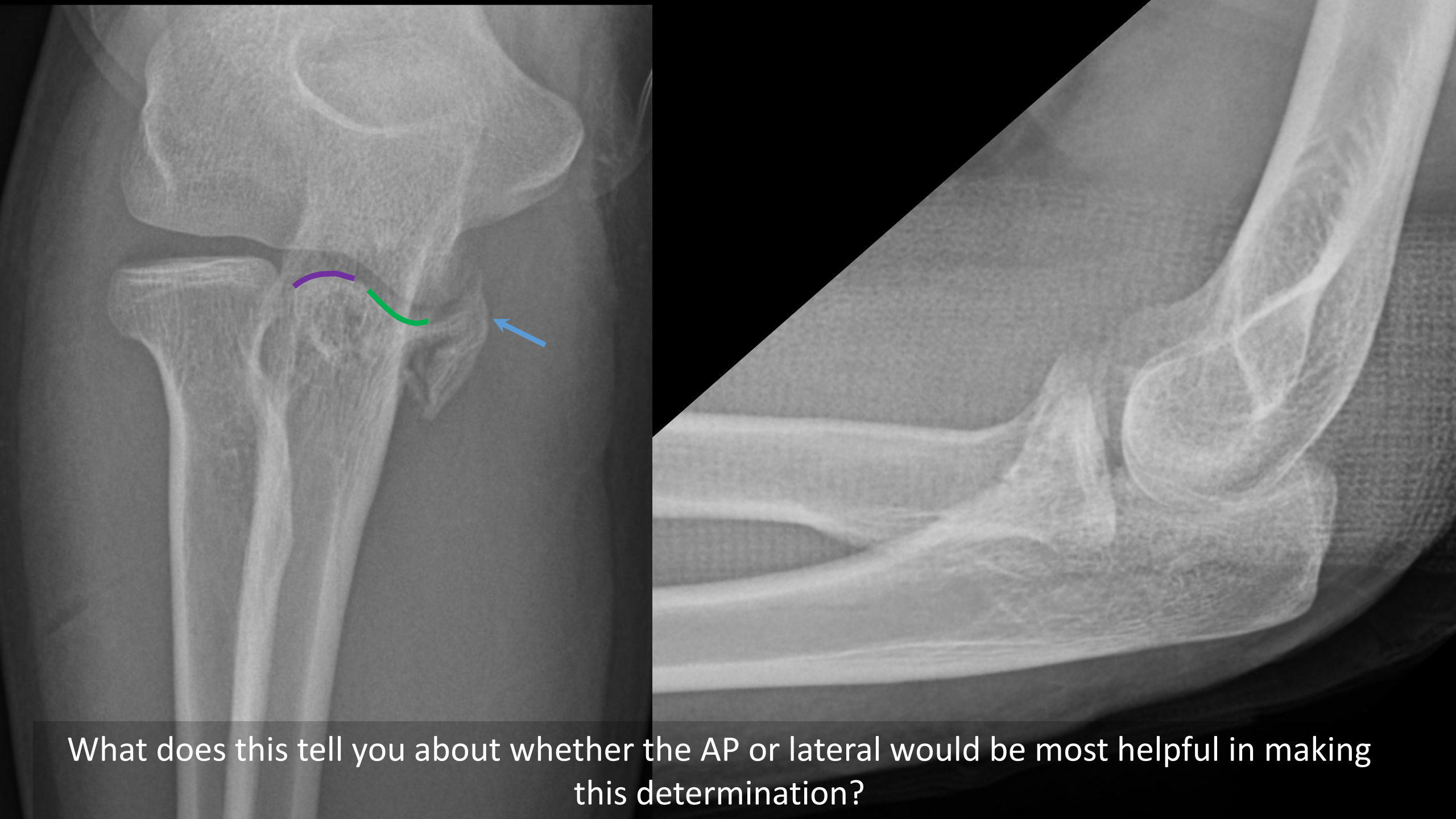
Sublime tubercle

Anteromedial rim

Anterolateral rim

Lesser sigmoid notch





What does this tell you about whether the AP or lateral would be most helpful in making this determination?

Tip:

1. ≤2mm of coronoid
2. >2mm of coronoid

Anteromedial:

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2. Anteromedial rim + tip
3. Anteromedial rim + sublime tubercle

Base:

1. Involving body + base
2. Transolecranon basal fracture

Tip:	Anteromedial:	Base:
It's at the tippity tip (mm)	1. It gets the anteromedial rim (+/- tip) 2. It gets the sublime tubercle	It gets everything, it's at the base

Let’s try a CT case

Fracture of the anteromedial facet and tip, but NOT the sublime tubercle

Tip:	Anteromedial:	Base:
It's at the tippity tip (mm)	1. It gets the anteromedial rim (+/- tip) 2. It gets the sublime tubercle	It gets everything, it's at the base

Drop sign

A persistent increased ulnohumeral distance (≥4mm) on the lateral view after elbow reduction is called a “drop sign” and is an indicator of continued instability following reduction.

Coonrad R, Roush T, Major N, Basamania C. The Drop Sign, a Radiographic Warning Sign of Elbow Instability. Journal of Shoulder and Elbow Surgery. 2005;14(3):312-7

In summary….

Expect the Pretzel

≥3 gets arthroplast'ee'

Partial or complete? %?

Sublime tubercle is key

(think AP and coronal CT images)

Additional Reading

- OTA radial head fx management: https://ota.org/sites/files/2021-06/UE%209%20Radial%20Head%20and%20Neck%20Fractures.pdf
- Ruchelsman, DE, Christoforou D, Jupiter Jb. Fractures of the Radial Head and Neck. J Bone Joint Surg Am, 2013: 95: 469-78
- Coonrad R, Roush T, Major N, Basamania C. The Drop Sign, a Radiographic Warning Sign of Elbow Instability. Journal of Shoulder and Elbow Surgery. 2005;14(3):312-7
- Flores D et al. Distal Radioulnar Joint: Normal Anatomy, Imaging of Common Disorders and Injury Classification. Radiographics, 2022: 43: 1
- Sheehan, S, Dyer G, Sodickson A, Patel K, Khurana B. Traumatic Elbow Injuries: What the Orthopedic Surgeon Wants to Know. Radiographics 2013: 33(3): 869-888