Simulated CBDs for PAH SpRs Project

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CASE #1

60F , HTN, chol
Passive ext. rotation is 5 degrees,
Passive abduction is 90 degrees
Active internal rotation is to her buttock
Active forward flexion is to 100 degree
Rotator cuff testing within the limited range of motion reveals grade 5 painless power throughout

CASE #1

- less prevalent than hip and knee osteoarthritis
- affects ~33% of patients over 65 years
  - only a subset are symptomatic

- Symptoms:
  - pain
  - crepitus, locking or catching
  - loss of motion
  - loss of function

CASE #1

Non-surgical

- analgesia as needed
- physical therapy
  - maintain and/or improve motion and strength
- cortisone injections
- activity modifications

CASE #1

Diagnosis

- weakness/atrophy
- tenderness
- decreased ROM
- crepitus

- Plain X-rays – 3 views
- CT scan
- Ultrasound
- MRI

CASE #1

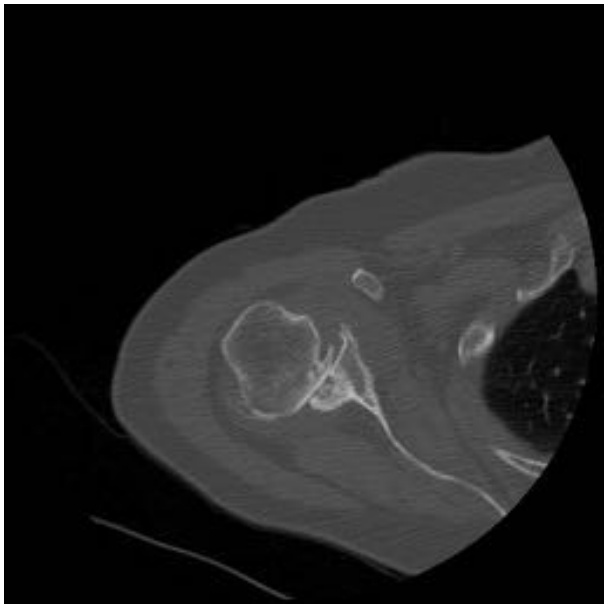
Normal Version

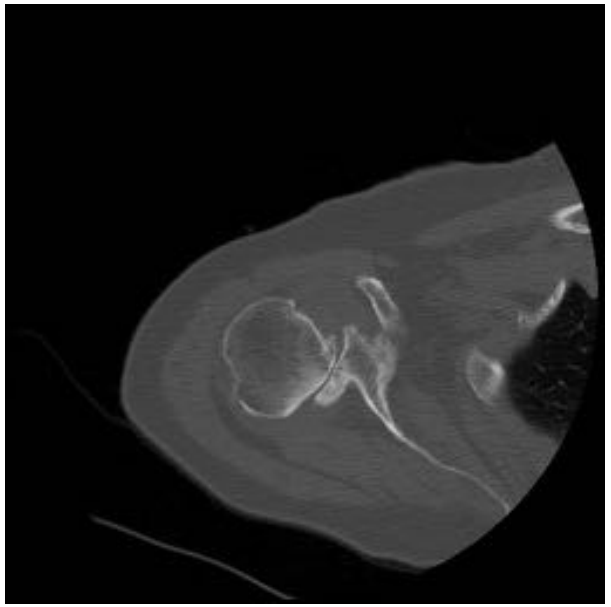
Glenoid: 2° anteversion - 7° retroversion

Humeral Head: 20° - 40° retroversion

Courtesy of Zimn

CASE #1





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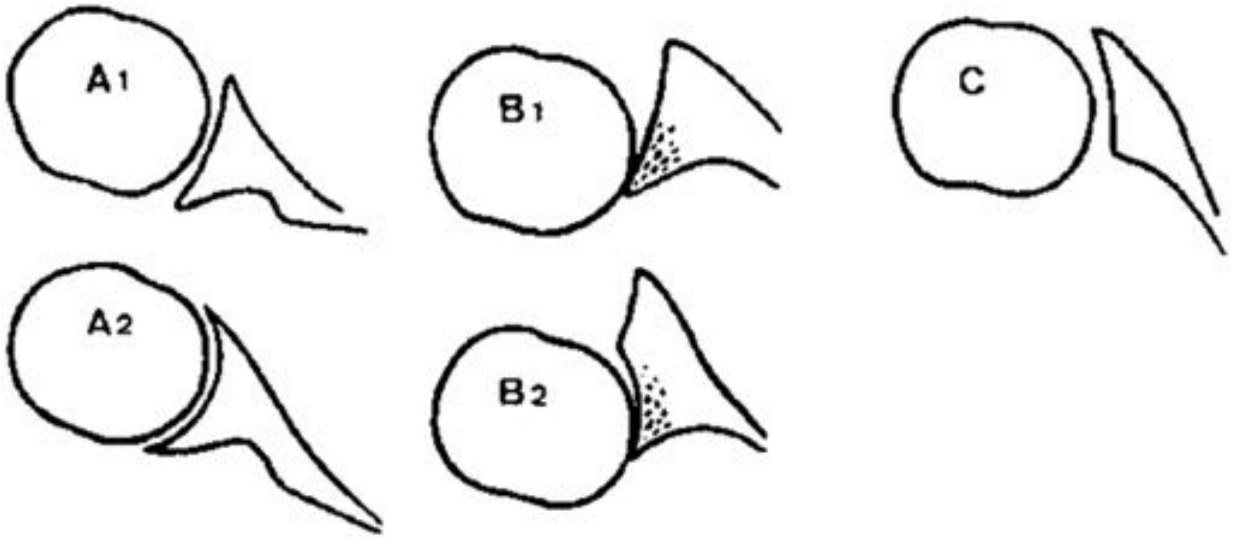
CASE #1



Walch G Badet R Boulahia A Khoury A. Morphologic study of the glenoid in primary glenohumeral osteoarthritis. J Arthroplasty. 1999 Sep;14(6)

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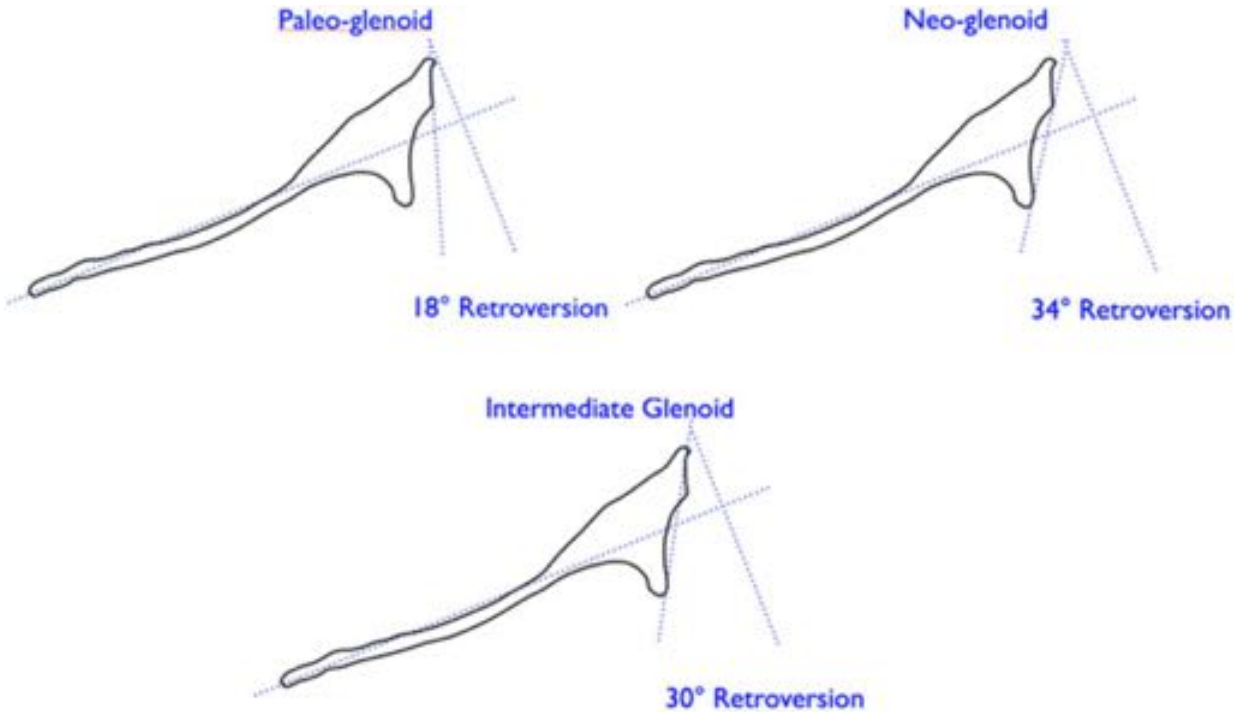
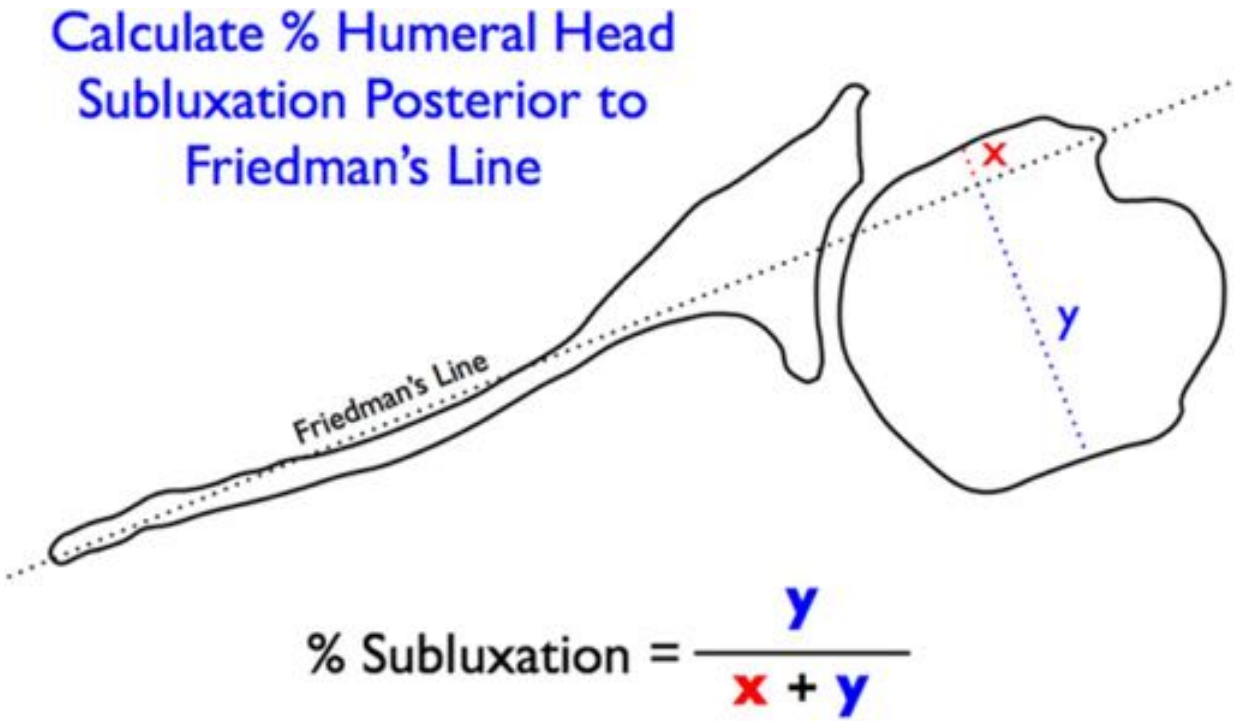
CASE #1



Mesiha M et al. JBJS Essent Surg Tech 2013;3:e21

CASE #1



Mesiha M et al. JBJS Essent Surg Tech 2013;3:e21

CASE #1

Surgical Options

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CASE #1

Hemi

- short easy procedure
- operating time
- less risk of instability
- can be revised to TSA

× less reliable pain relief

× progressive glenoid erosion may cause results to deteriorate over time

× need concentric glenoid

Total

- more consistent pain relief
- better fulcrum for active motion

× more difficult procedure

× longer OR time

× poly wear can cause loosening of both components

× more glenoid bone loss

CASE #1

What is evidence?

Kirkley et al, 2000

Gartsman, 2000

Bryant D et al, 2005

Haines JF et al 2006

CASE #1

Complications

- Instability 1.2%
  - malpositioning
  - subscap rupture
- Infection 0.5%
  - S. aureus
  - P. acnes
- Heterotopic ossification
  - 10-45%
  - males
- Glenoid loosening
- Periprosthetic Fracture
  - common in RA
  - intra-op 1%
  - post-op 0.5 - 2%
  - glenoid fractures rare
- Stiffness
- Axillary nerve injury
  - brachial plexus

CASE #1

Surgical Approach

Deltopectoral:

- cephalic vein
- conjoint tendon
- biceps tendon
- ant. ircumflex vessels
- rotator interval

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CASE #1

5 steps to the front door:

Cephalic vein

Rotator Interval

Biceps tendon

Conjoint tendon

Anterior circumflex vessels

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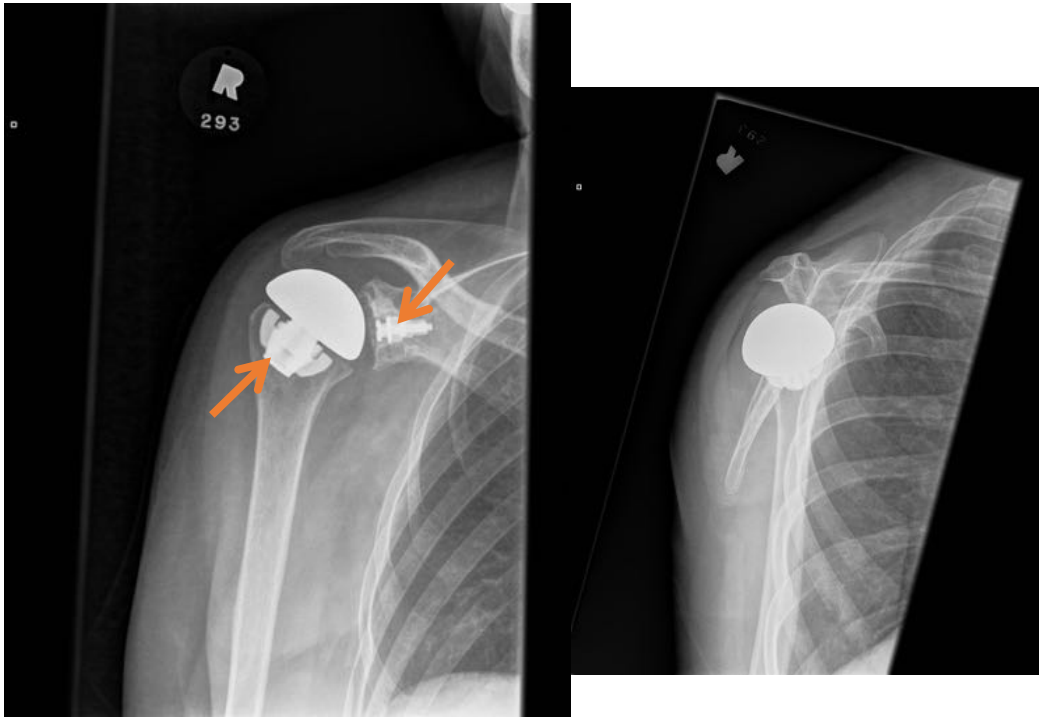
CASE #1



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CASE #1

Glenoid

Boileau P, Avidor C, J Shoulder Elbow Surg. 2002 J Aug;11(4):351-9

40 Shoulders with 3 year follow up.

- Metal-backed – 2% radiolucent lines, 100% progressive, 25% loose in 3 years. Associated with shift and osteolysis.
  - overstuffing
  - poly-metal dissociation

- Cemented – 80% radiolucent lines, 25% progressive. None loose in 3 years.

CASE #1
Humeral Components

CEMENTED	UNCEMENTED		
	STEMLESS	PROX POROUS COATED	FULLY POROUS COATED
Good for osteopenic bone Lower risk of intra-operative fracture More stress-shielding Hard to revise	Need good bone stock Lower risk intra-operative fracture Easier to revise	Need good bone stock Higher risk of intra-operative fracture Less stress-shielding Easier to revise	Need good bone stock Higher risk intra-operative fracture More stress-shielding Hard to revise

CASE #1

Cemented vs Uncemented Humeral Components

Cemented versus uncemented fixation of humeral components in total shoulder arthroplasty for osteoarthritis of the shoulder: a prospective, randomized, double-blind clinical trial-A JOINTs Canada Project.

Litchfield et al. J Shoulder Elbow Surg. 2011 Jun;20(4):529-36.

Level I evidence that cemented fixation of the humeral component provides better quality of life, strength, and range of motion than uncemented fixation.

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CASE #1

CASE #1

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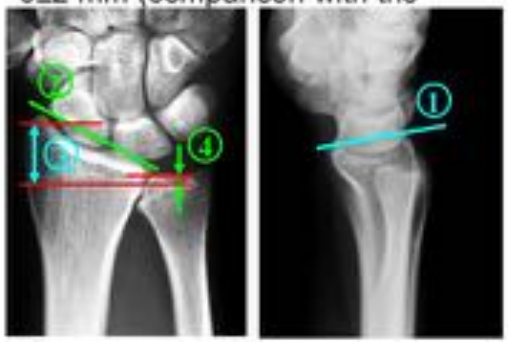
CASE #2

- 26y F
- Housewife
- Fell downstairs
- Fit and well, Rt handed

CASE #2

Radiological evaluation—remember the normal anatomy

1. Palmar tilt — average 11°(1–21) → dorsal tilt
2. Radial tilt — average 23°(13–30)
3. Radial length — average 10 mm
4. Ulnar variance — 0±2 mm (comparison with the intact side)



CASE #2

CASE #2
Fracture Stability

LaFontaine

- Initial dorsal angulation greater than 20 degrees
- Dorsal comminution
- Intraarticular
- Associated ulnar styloid
- Age greater than 60

Weder

- Dorsal comminution volar to midaxial line

Abbaszadegan

- Axial shortening 4mm or more

CASE #2

Extraarticular Alignment

Axial load shifts with increasing dorsal tilt

	Axial Load	
	Radius	Ulna
Normal	80%	20%
Dorsal tilt 20	50%	50%
Dorsal tilt	33%	67%

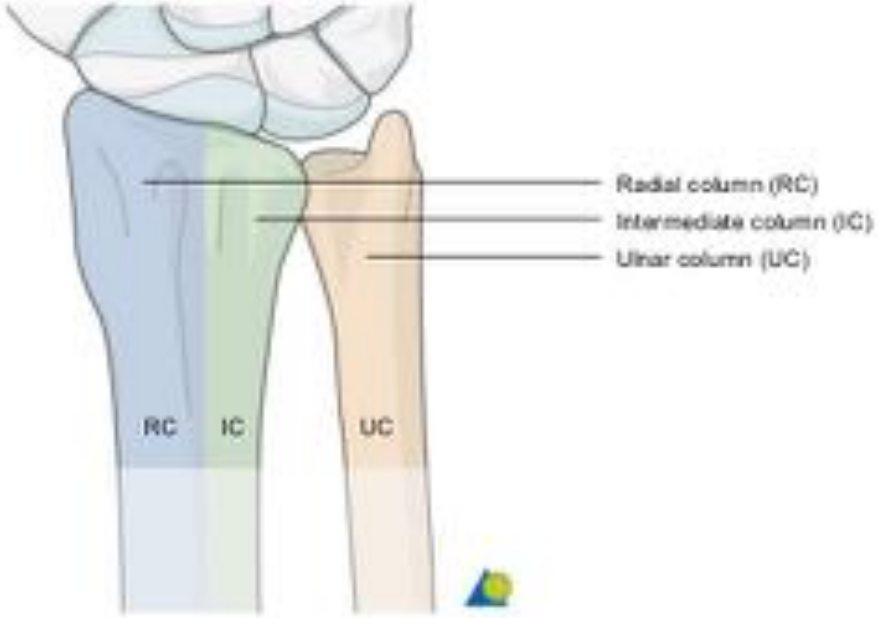
Short: J Hand Surg 12A: 529,1987

CASE #2

Which column affected?

CASE #2

The three-column concept



CASE #2

- Radial Column

  Important for ligament support

- Intermediate Column

  Load transmission

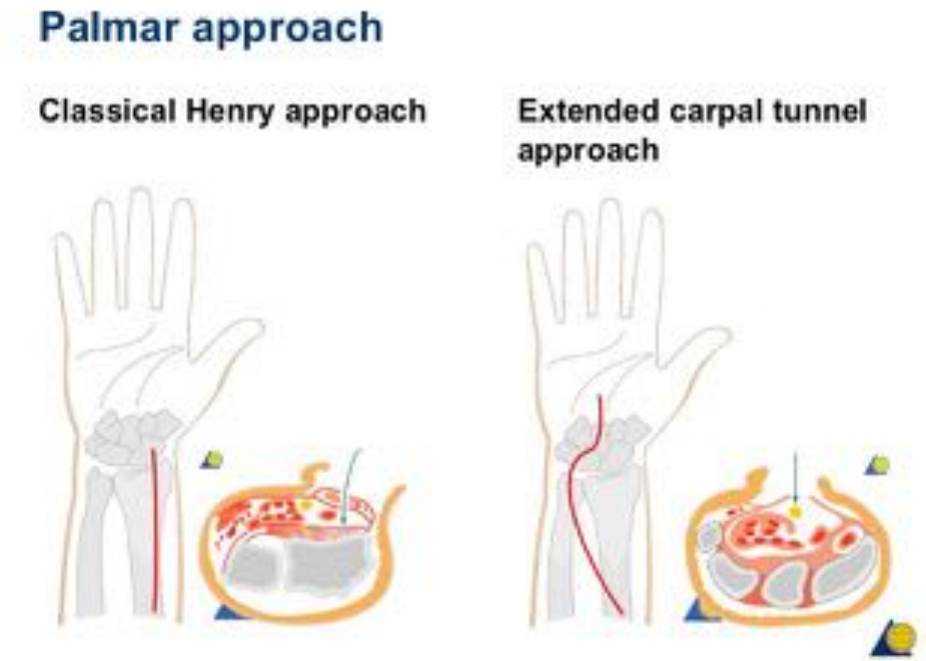
- Ulnar Column

  Forearm rotation
  Secondary load transmission

Rikli DA, Regazzoni P. Fractures of the distal end of the radius treated by internal fixation and early function. A preliminary report of 20 cases. J Bone Joint Surg. 1996

CASE #2

Approach



CASE #2

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CASE #3

- 31y M
- Post man, also manual labour
- Fit and Well
- High energy fall

CASE #3

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CASE #3

CASE #3

Elbow Dislocations

- Simple
- Complex
- Terrible Triad

CASE #3

Elbow Stabilizers

Primary

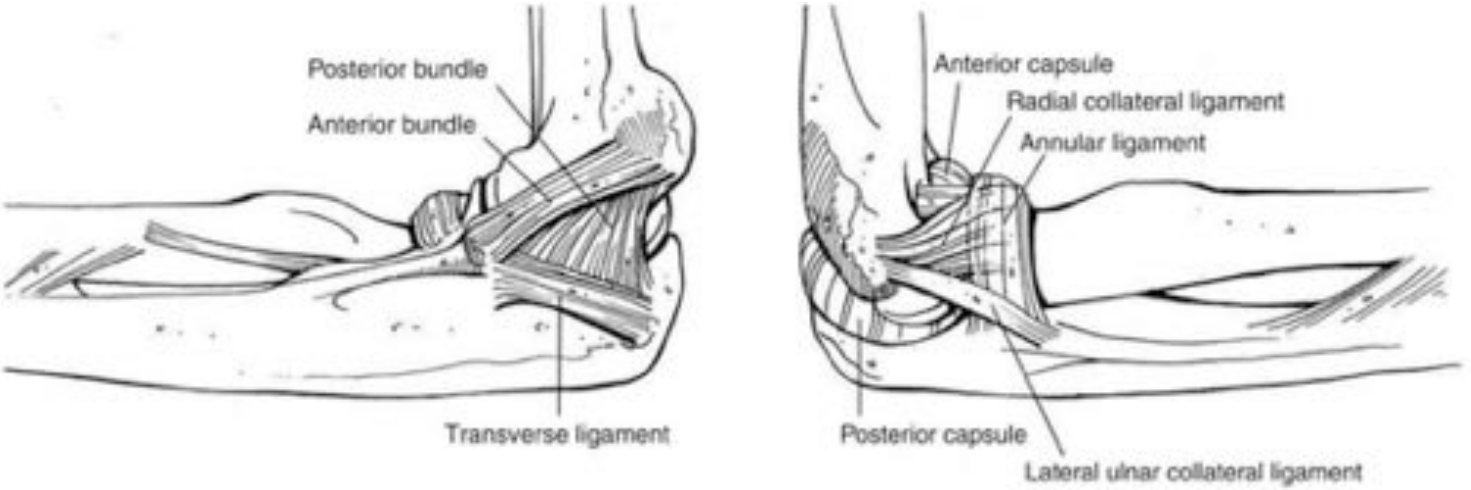
- Ulnohumeral Articulation
- MCL
- LCL

Secondary

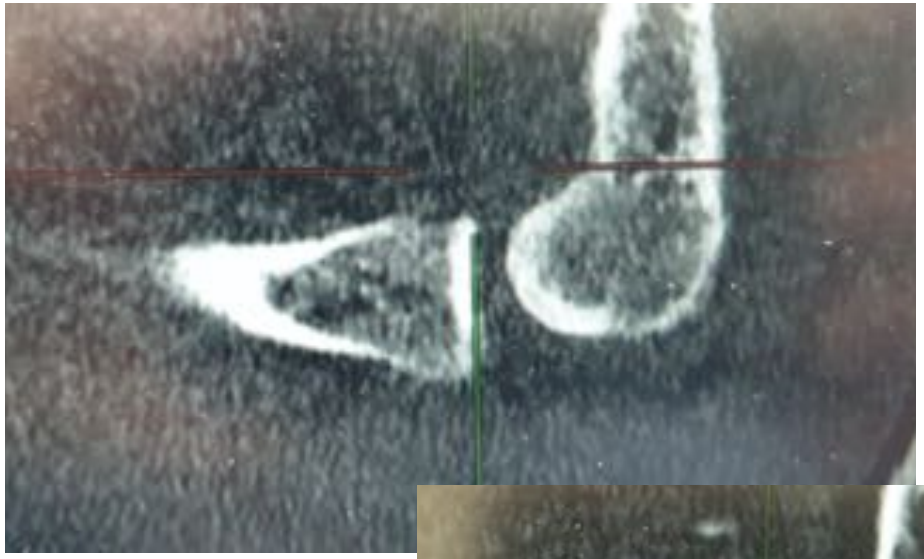
- Radial Head
- Joint capsule
- Common Flexor and Extensor Origins

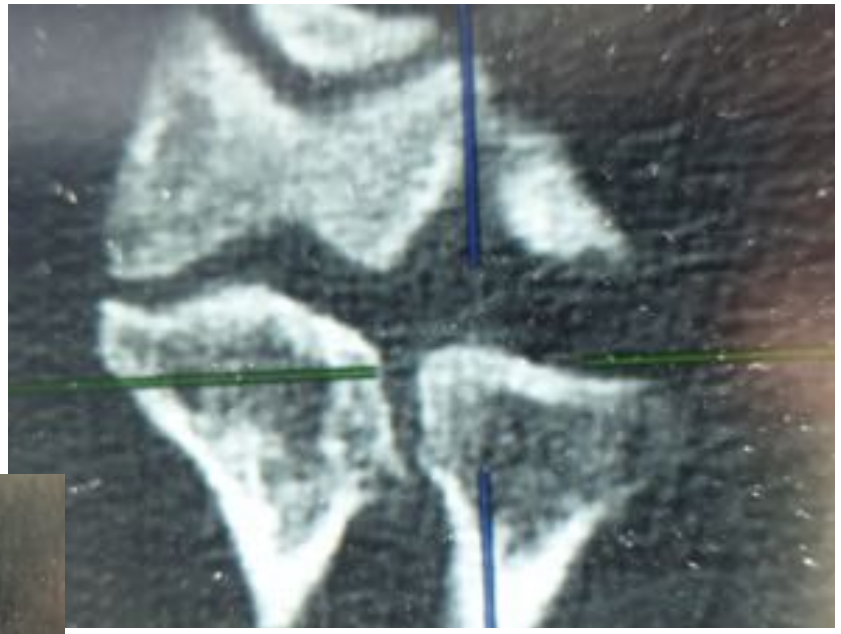
CASE #3

Elbow ligaments



CASE #3





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CASE #3

Non Surgical treatment

- ✓ After reduction joint should concentrically reduced
- ✓ Extend approximately to 30 degrees before becomes unstable
- ✓ Allows early ROM

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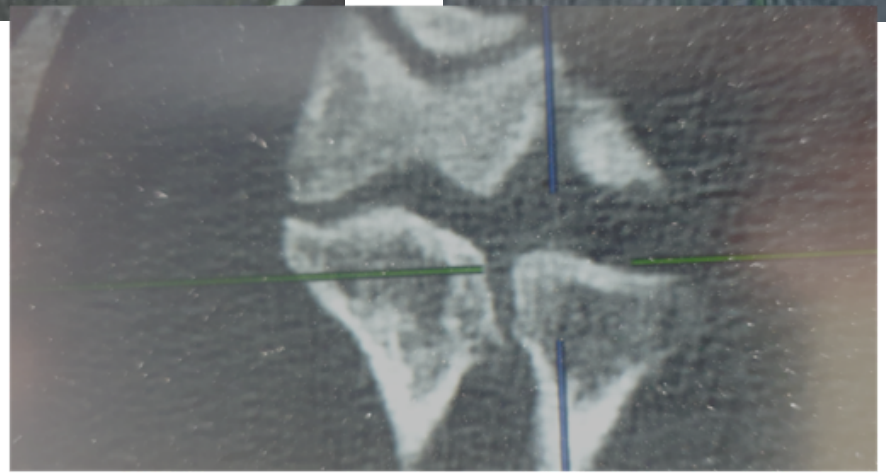
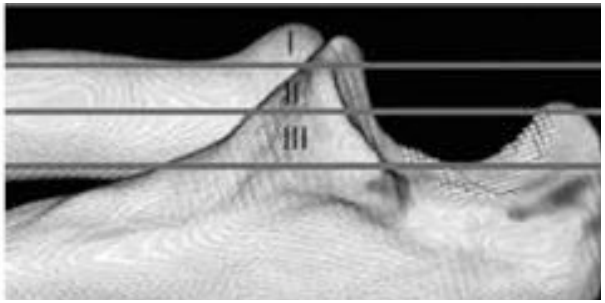
CASE #3

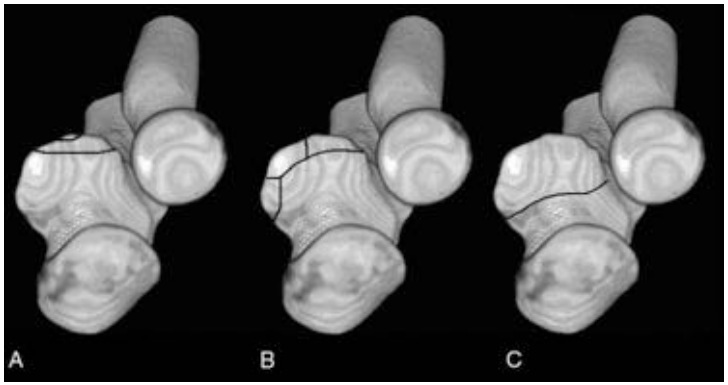


CASE #3

Coronoid fractures



Regan - Morrey



O'Driscoll

Which one common in terrible triad?

CASE #3

What to do with Coronoid and Radial head?

The Effect of Radial Head Excision and Arthroplasty on Elbow Kinematics and Stability

Daphne M Beingessner[1], Cynthia E Dunning, Karen D Gordon, James A Johnson, Graham J W King

JBJS Am, 2004 Aug

Beingessner DM, Stacpoole RA, Dunning CE, Johnson JA, King GJ: The effect of suture fixation of type I coronoid fractures on the kinematics and stability of the elbow with and without medial collateral ligament repair. *J Shoulder Elbow Surg* 2007;16:213-217.

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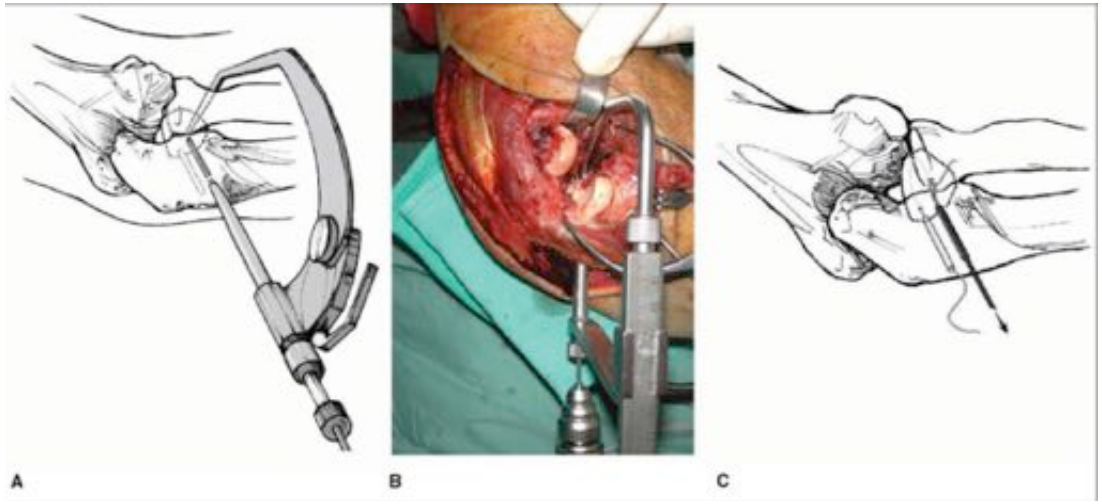
CASE #3

Coronoid Fixation



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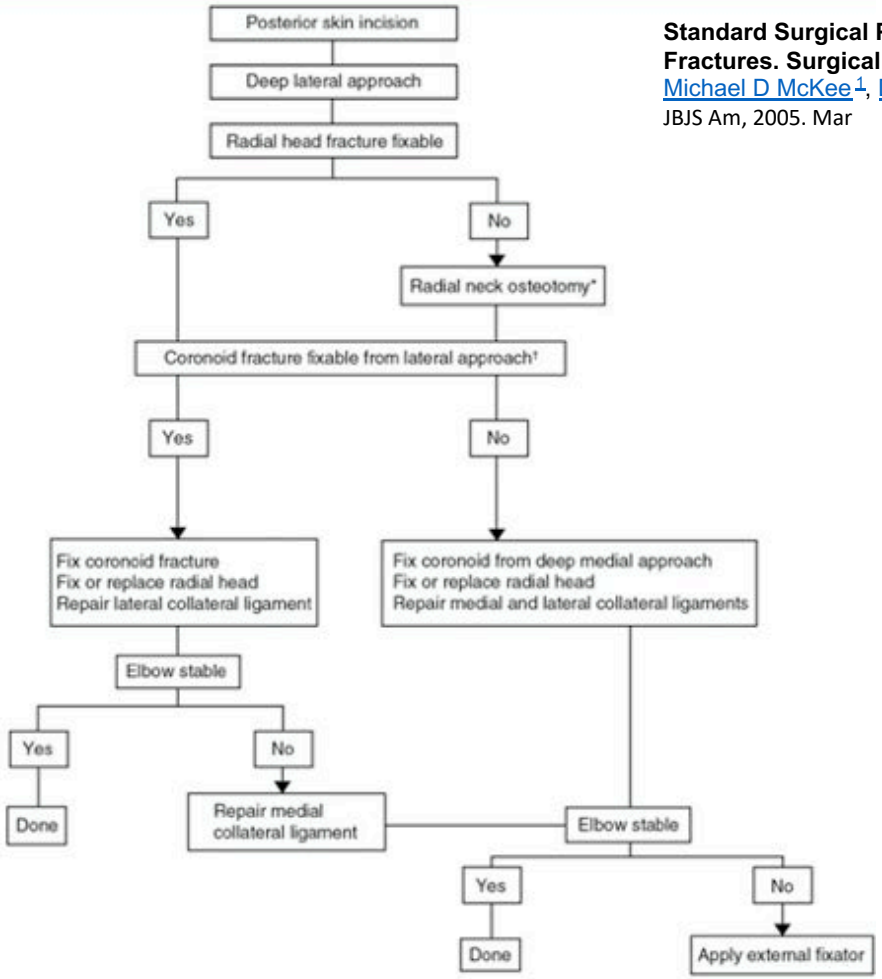

Standard Surgical Protocol to Treat Elbow Dislocations With Radial Head and Coronoid Fractures. Surgical Technique

Michael D McKee[1], David M W Pugh, Lisa M Wild, Emil H Schemitsch, Graham J W King

JBJS Am, 2005. Mar

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CASE #3

CASE #3

1 y postop

CASE #3

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