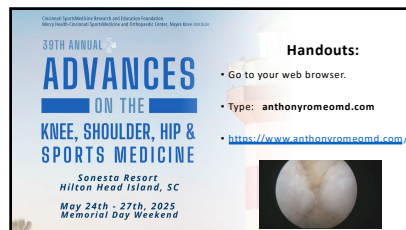
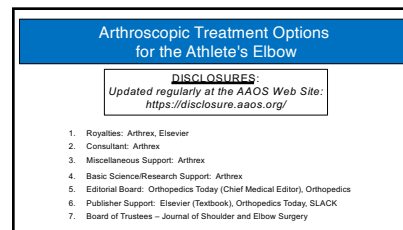




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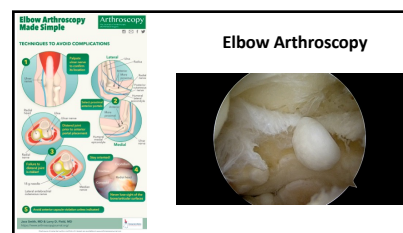
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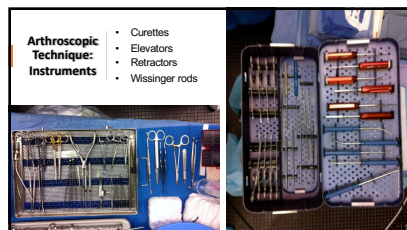
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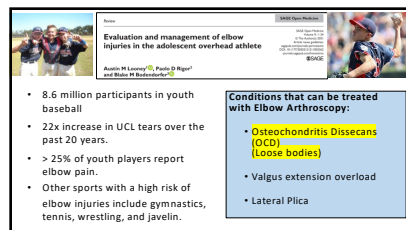
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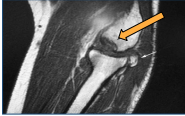
9



10

Osteochondritis Dissecans (OCD)

- Disorder of subchondral bone resulting in fragmentation of cartilage and underlying bone
- Typically, in adolescents (13 – 17 years of age)
- Ultimately, idiopathic disorder



11

OCD = Panner's Disease?



12

Panner's Disease

- Less than 13 years old
- Believed to be caused by interference in blood supply
- Most common in dominant elbow in boys between 5-12
- Results in resorption & eventual repair



13

Panner's vs. OCD?

- Radiographs demonstrate fragmentation of entire capitulum (versus focal lesion in OCD)
- Condition is self-limiting and resolves with rest (3-6 months)



14

Osteochondritis Dissecans (OCD)

- Most common in overhead athletes (baseball) as well as gymnasts
- Repetitive valgus forces on elbow with compression against capitulum (baseball)
- Repetitive elbow compression with axial force through hands/wrist (gymnastics)



15

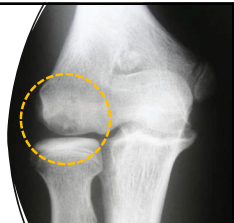
Etiology?

Localized injury

- Bone
- Cartilage

Single vs Chronic
Compromised Vascularity

Combination of genetic, traumatic, and vascular factors



16

Etiology

Prevalence and Clinical Characteristics of Osteochondritis Dissecans of the Humeral Capitellum Among Adolescent Baseball Players

Risk Factors:

- Started baseball at younger age
- Played for longer periods of time
- Had experienced more elbow pain
- No correlation with position played



17

Clinical Presentation

- Lateral elbow pain associated with activity
- In sports with repetitive upper extremity use
- Loss of elbow motion
 - Flexion contractures 15+ degrees in some cases



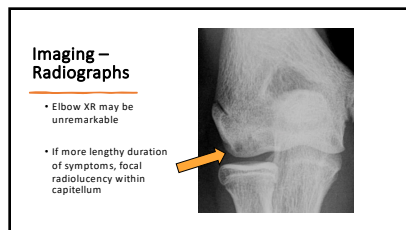
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Clinical Presentation

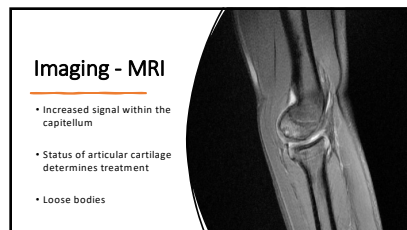
- Tenderness over radiocapitellar joint
- Mechanical symptoms (locking, catching) indicates possible presence of loose body



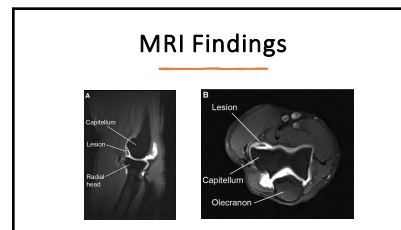
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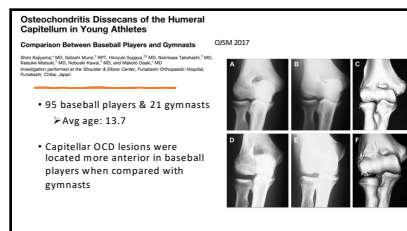
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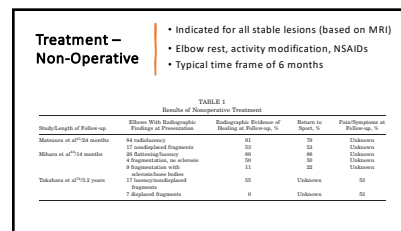
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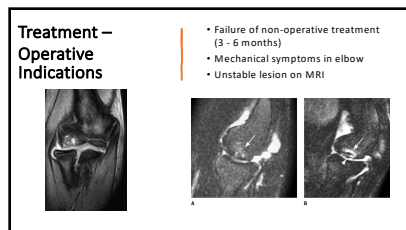
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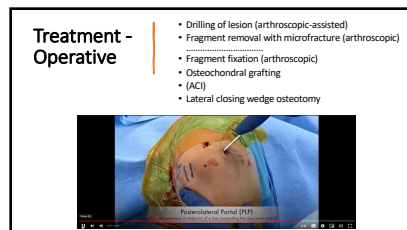
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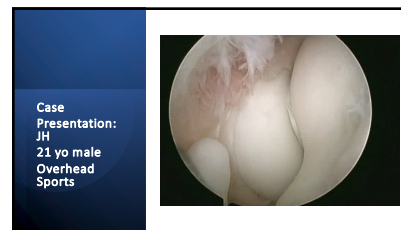
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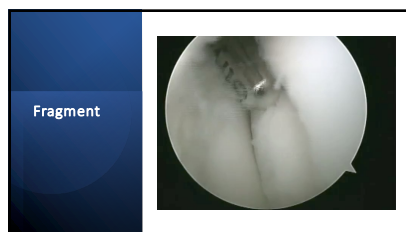
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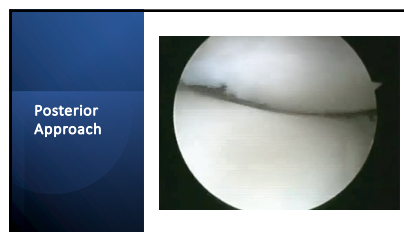
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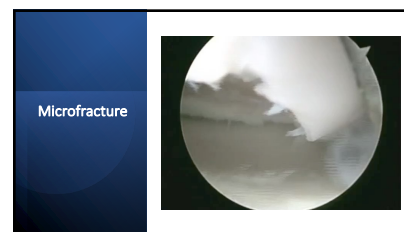
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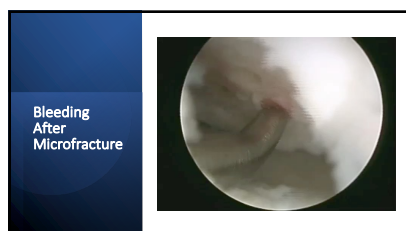
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32



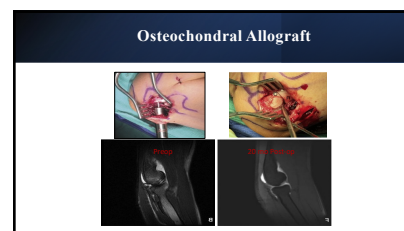
33

Osteochondral Allograft

Fresh osteochondral allograft transplantation for osteochondritis dissecans of the capitulum in baseball players
J Shoulder Elbow Surg (2016) 25, 1839–1847
Raffy Mirzayan, MD^{*,*}, Michael J. Lim, MD^{*}

Nine baseball players-15.3 yrs (14-18)
Fresh Femoral Hemicapitulum
All Scores saw significant improvement (p<0.01)
• Mayo Score improved 57.8 to 98.9
• DASH Score improved 22.4 to 44.8
• DASH improved 35.2 to 5.4
• VAS improved 32.8 to 82.5
All patients returned to baseball and were active for at least 2 yrs

42



43

Systematic Review:
30 out of 278 Studies

Treatment Strategies and Outcomes for Osteochondritis Dissecans of the Capitulum

Grade 1 & 2 = Nonoperative
Grade 3 & 4 = Operative

Grade	Treatment	Patients	Follow-up (yrs)	Return to Sport (%)	Complications (%)
Grade 1	Nonoperative	10 (33.3)	1.0	100	0
	Operative	2 (6.7)	1.0	100	0
Grade 2	Nonoperative	10 (33.3)	1.0	100	0
	Operative	2 (6.7)	1.0	100	0
Grade 3	Nonoperative	10 (33.3)	1.0	100	0
	Operative	2 (6.7)	1.0	100	0
Grade 4	Nonoperative	10 (33.3)	1.0	100	0
	Operative	2 (6.7)	1.0	100	0

47

Return to Sport

Return to Sports by UCB Grade and Treatment Type^{a,b}

Grade	Treatment	Patients	Return to Sport (%)
Grade 1	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100
Grade 2	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100
Grade 3	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100
Grade 4	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100

Grade 3 & 4 = POOR Results with Nonoperative Treatment

48

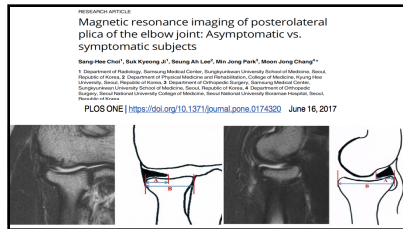
107 Cases

Grade 1 & 2 = Nonoperative
Grade 3 & 4 = Operative

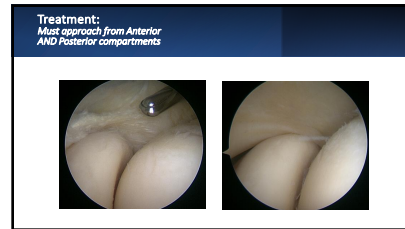
Grade	Treatment	Patients	Return to Sport (%)
Grade 1	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100
Grade 2	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100
Grade 3	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100
Grade 4	Nonoperative	10 (33.3)	100
	Operative	2 (6.7)	100

60

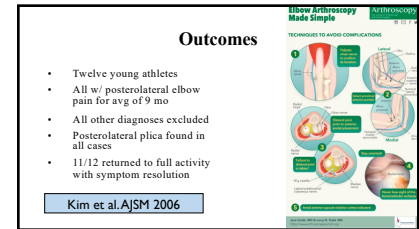
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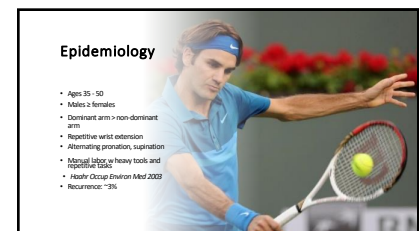
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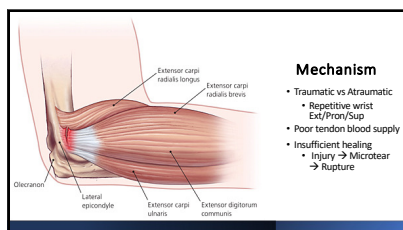
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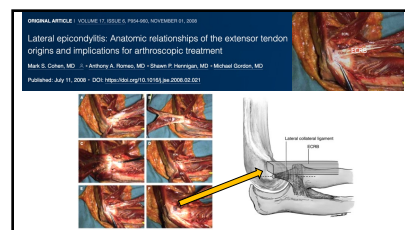
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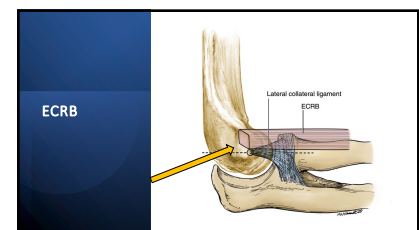
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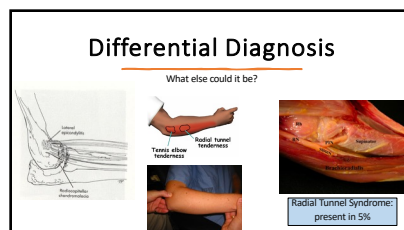
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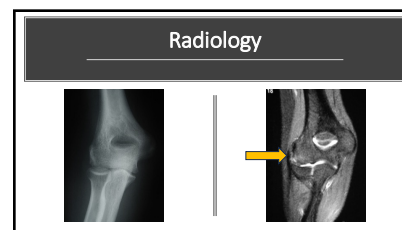
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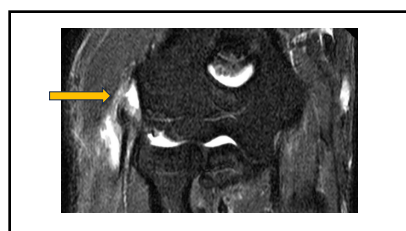
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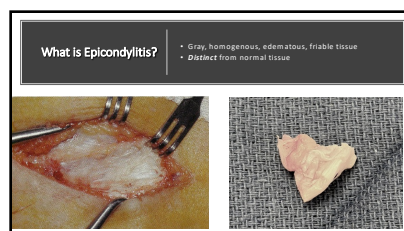
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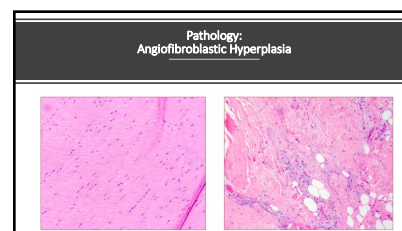
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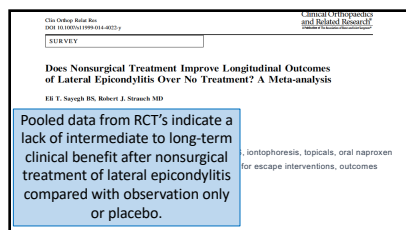
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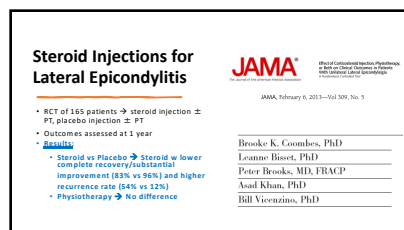
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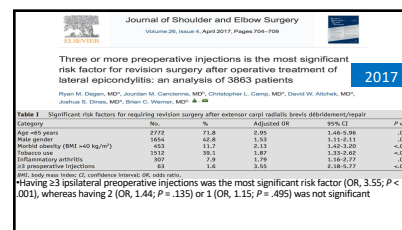
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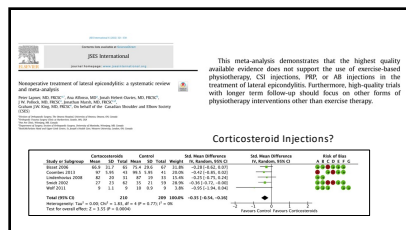
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86



87



88

Lateral Epicondylitis Treatment

- PT / OT
- Elbow bracing
- Modalities
- Wrist bracing
- Cortisone injections
- PRP injections
- Tenex
- Nitrous patches
- Botox
- Debridement (open or arthroscopic) with or without repair

92

Conclusion:
This meta-analysis demonstrates that the highest quality available evidence **does not support**

- Exercise-based physiotherapy
- CI injections
- PRP

Recommendation:
PT should focus on other forms of physiotherapy interventions other than exercise therapy

93

Operative Treatment

- Open
- Percutaneous
- Arthroscopic

Failure of > 6 months Non-operative Treatment

94

Surgical technique-open

95

Arthroscopic Technique

96

Surgical technique-arthroscopic

Techniques in Shoulder and Elbow Surgery 2010

97

Rehabilitation

- Sling
- A/AA ROM E/W/H
- Isometric to tolerance
- Modalities
- Work/home modifications
- Functional progression

98

Rush Experience (2010)

Arthroscopic debridement of the extensor carpi radialis brevis for recalcitrant lateral epicondylitis

99

Outcomes

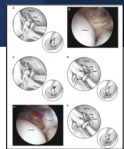


Table 1: Demographics

Age	42 ± 7.3
Gender	24 (56.5%) Female
Duration	2.1 (range)
History	2.5 ± 4.4 (range)
History of prior surgery	0%
History of compensation	20%
History of ulnar nerve	20%

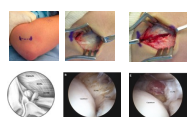
Table 2: Results

Preoperative	Postoperative	Mean (range)
Visual analog pain	0.2 ± 0.2	0.2 (0-1)
Visual analog function	0.2 ± 0.2	0.2 (0-1)
Visual analog satisfaction	0.2 ± 0.2	0.2 (0-1)

100

Factors Associated with Increased Likelihood of Requiring Operative Treatment

- Radial Tunnel Syndrome
- History of a Prior Corticosteroid Injection
- Workers' Compensation
- Multiple Visits to Surgeon



101

Medial Elbow

Main anatomic structures:

- Medial Epicondyle
- Flexor Pronator Mass
- Ulnar Collateral Ligament
- Ulnar nerve



102



- Medial Epicondyle
- UCL
- Sublime Tubercle
- Ulnar Nerve
- Flexor Mass Origin/MT Junction
- Olecranon

103

Golfer's Elbow (Medial Epicondylitis)

Pathologic Area:

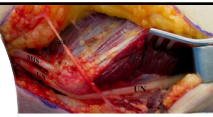
- region where deep fibers of the flexor tendons and pronator teres originate from the medial epicondyle
- Proximal to the Ulnar Collateral Ligament



104

Medial Epicondylitis

- 10% of the population
- < 1% prevalence
- 5-10x less common than LE
- Commonly ages 30-60
- No permanent sequelae
- Generally resolves with or without treatment in 12-18 months...which is NOT ACCEPTABLE in ATHLETES



105

Risk Factors

- sports that require repetitive wrist flexion/forearm pronation during ball release
- common in golfers, baseball pitchers, javelin throwers, bowlers, weightlifters, racquet sports
- tennis
- late ball strike (racquet head behind elbow at ball contact)
- poor forehand stroke mechanics
- failure to use vibration dampeners attached to strings
- athletes, may develop in response to large valgus forces on elbow
- jobs involving lifting >20kg, forceful grip, exposure to constant vibration at elbow (plumbers, carpenters, construction workers)

20-30% may present with Ulnar Neuropathy Symptoms

106

Medial Epicondylitis: evaluation and management

Review: J Am Acad Orthop Surg. 2016 Jun;23(6):348-55. doi: 10.5435/JAOS-D-14-00145.

Nrav H Amin, Neil S Kumar, Mark S Schickendantz

PMID: 26601427 DOI: 10.5435/JAOS-D-14-00145



Repetitive eccentric loading of the muscles conducting wrist flexion and forearm pronation combined with valgus overload at the elbow

107

Sport-Specific Treatment

Equipment

Technique

Elbow Pad

Concentric and Eccentric resistance exercises

Golf

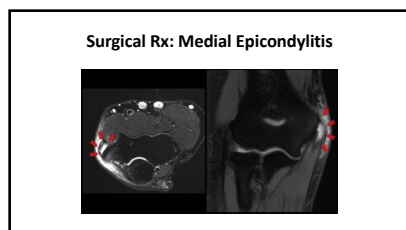
- Clubs: Length, shaft weight, club head weight, club head strike zone
- Proper technique
- Often found in the trail arm of the swing
- Pronator Teres more likely in amateurs

Tennis

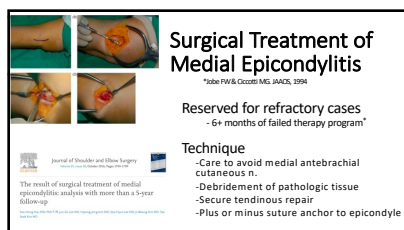
- Racquet size, weight, head weight, strike zone, string tension
- Poor forehand stroke, late ball strike, open stance



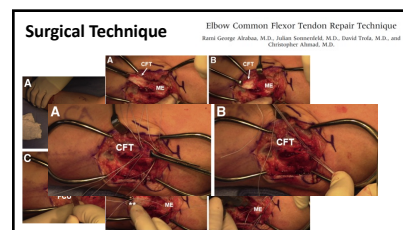
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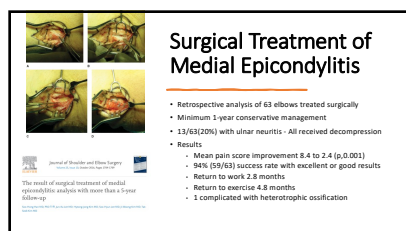
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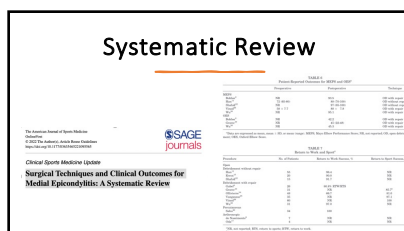
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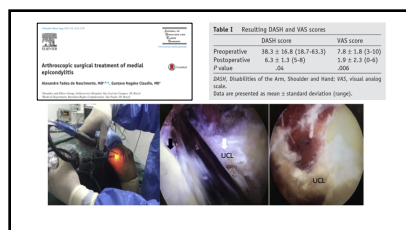
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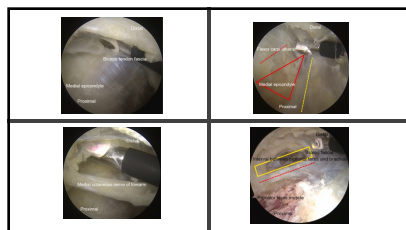
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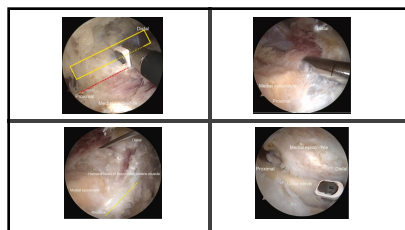
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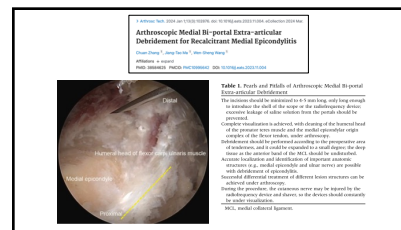
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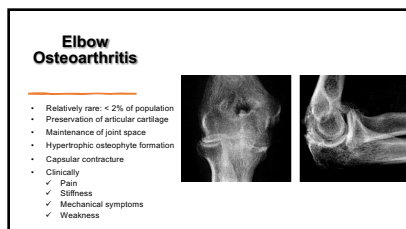
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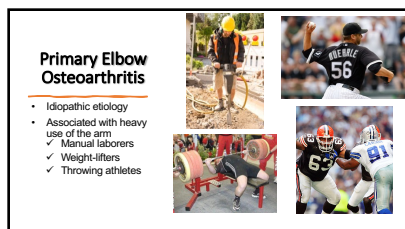
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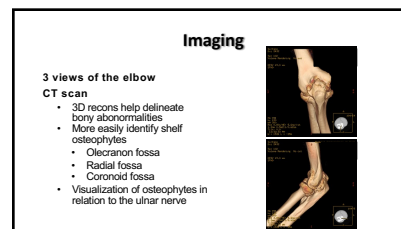
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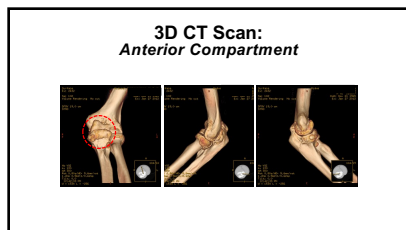
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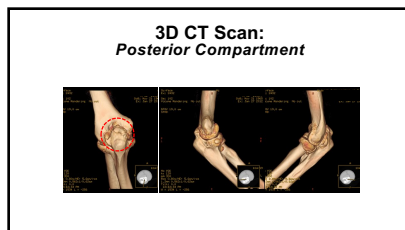
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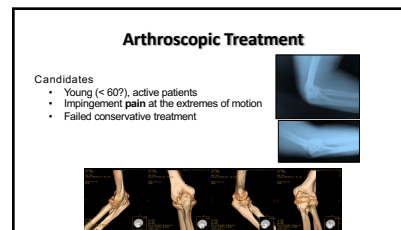
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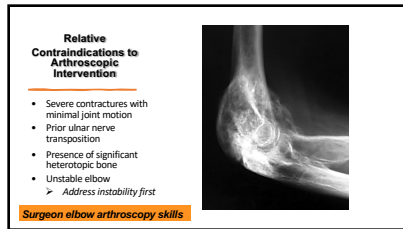
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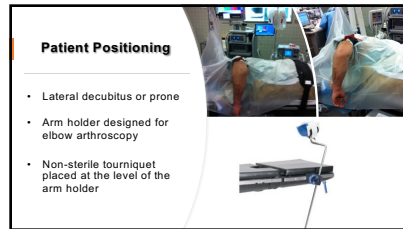
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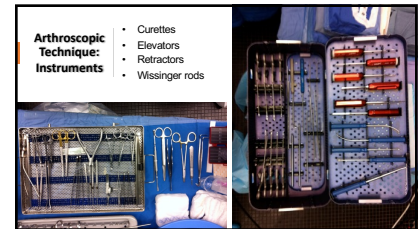
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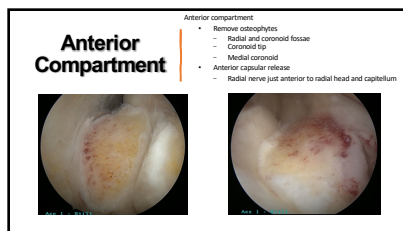
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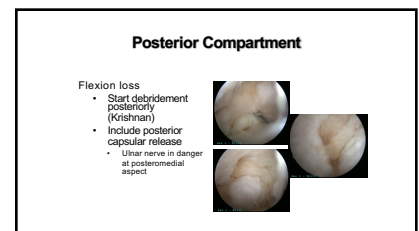
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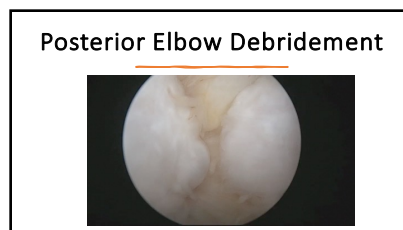
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140



141

Intraoperative Range of Motion



142

Post Op

- Drains per surgeon's discretion
- Soft compressive dressing
- Continuous passive motion per surgeon's discretion for 3-4 weeks post-op
- Formal therapy to begin POD#1
- Indomethacin post-op
- Heterotopic ossification prophylaxis
- Helps with inflammation during rehab



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Early Postoperative ROM



144

Arthroscopic Management of the Stiff Elbow

Dr. Anthony A. Romeo, MD
Chicago, Illinois, USA

JAAOS 2011

Author	Year	Study Type	Sample Size	Follow-up (years)	Primary Outcome	Secondary Outcome
Chen et al.	2008	Retrospective	10	2.5	ROM	Complications
Chen et al.	2009	Retrospective	10	2.5	ROM	Complications
Chen et al.	2010	Retrospective	10	2.5	ROM	Complications
Chen et al.	2011	Retrospective	10	2.5	ROM	Complications
Chen et al.	2012	Retrospective	10	2.5	ROM	Complications
Chen et al.	2013	Retrospective	10	2.5	ROM	Complications
Chen et al.	2014	Retrospective	10	2.5	ROM	Complications
Chen et al.	2015	Retrospective	10	2.5	ROM	Complications
Chen et al.	2016	Retrospective	10	2.5	ROM	Complications
Chen et al.	2017	Retrospective	10	2.5	ROM	Complications
Chen et al.	2018	Retrospective	10	2.5	ROM	Complications
Chen et al.	2019	Retrospective	10	2.5	ROM	Complications
Chen et al.	2020	Retrospective	10	2.5	ROM	Complications
Chen et al.	2021	Retrospective	10	2.5	ROM	Complications
Chen et al.	2022	Retrospective	10	2.5	ROM	Complications
Chen et al.	2023	Retrospective	10	2.5	ROM	Complications
Chen et al.	2024	Retrospective	10	2.5	ROM	Complications
Chen et al.	2025	Retrospective	10	2.5	ROM	Complications

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Complications

- Heterotopic ossification
- Nerve injury
- Septic arthritis
- Compartment syndrome
- Persistent portal drainage



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Thank you!

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