

Natural History of RTC Disease Is Non Op Treatment OK in a Young Person?

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COI Disclosure Information

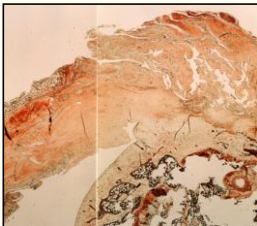
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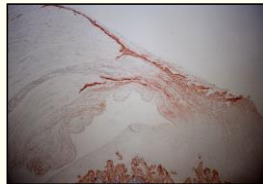
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Rotator Cuff Healing

- Imperfect process
 - Fibrovascular scar, disorganized reparative process



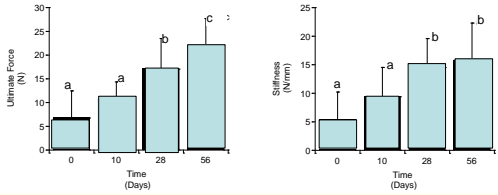
8 week
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Uninjured

Galatz, JOR, 2006

Biomechanics



Structural properties 1/2 normal
 Material properties 1/10 normal
 $a < b < c$ ($p < 0.05$)

Overall, RTC repair tissue 1/5 to 1/10 of normal!!

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Factors Associated with Healing

- Natural history
 - Age of onset
 - Progression with time
- Repair construct
 - Single vs double row, anchors
 - Technique, suture configuration
- Environmental Factors
 - Smoking, other exposures(?)
- Biology
 - Age, medical comorbidities (hypercholesterol, diabetes)

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Rotator Cuff Healing

- First thing we know is...

Not Everyone Heals the Tear

- Harryman- JBJS 1991
 - 60% healed
 - High failure rate in larger tears
 - Healed tears did better
 - Age significant factor!!

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RTC Healing

- Boileau- JBJS, 2005
 - 65 supraspinatus tears
 - 71% healed
 - AGE factor influencing healing
 - Over 65 yo, 43% chance of healing (68 vs 58)
- Lichtenberg, Habermeyer- Knee Surg Sports Traum, 2006
 - 53 supraspinatus tears
 - 75% healed
 - Age negative prognostic factor (65 vs 59)

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Rotator Cuff Tear

THE OUTCOME AND REPAIR INTEGRITY OF COMPLETELY ARTHROSCOPICALLY REPAIRED LARGE AND MASSIVE ROTATOR CUFF TEARS

BY LEESA M. GALATZ, MD, CRAIG M. BALL, FRACS, SHARLENE A. TERRY, MD, WILLIAM D. MIDDLETON, MD, AND KEN YAMAGUCHI, MD

Investigation performed at the Shoulder and Elbow Service, Departments of Orthopaedic Surgery and the Mallinckrodt Institute of Radiology, Washington University School of Medicine, Barnes-Jewish Hospital, St. Louis, Missouri

- 94% persistent tear
- avg ASES score 80/100
- 17/18 patients >60 yo

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JBJS '04

Takedown Repair of PTRCT

- Washington Univ Experience
 - 43 double row, primary repairs
 - Ultrasound imaging modality
 - 38/43 (88%) healed
 - Age most significant factor
 - Healed- 51.8 yrs
 - Not healed-62.7 yrs

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Kamath, JBJS, 2009

Double Row Repair

- Washington Univ. experience
 - 49 repairs
 - 51% healed, 49% defect
 - 67% single tendon healed
 - 36% multi tendon healed
 - Size- $p=0.03$
 - Age- $p=0.006$ (63 vs 55)
 - Healing status had no effect on functional outcome

Tashjian, AJSM, epub

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Double Row Revision Repair

- Washington University
- 21 repairs
- 48% intact
 - 7/10 (70%) single tendon
 - 3/11 (27%) multi tendon
- Age ($p=0.05$)
- # tendons ($p=0.05$)
- Intact repairs-better Constant and strength

Keener, JBJS, 2010

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Operative Treatment

- | | |
|--|--|
| <ul style="list-style-type: none"> • Pros <ul style="list-style-type: none"> – History of great results – Restore anatomy – Change progression of tear – Pain relief | <ul style="list-style-type: none"> • Cons <ul style="list-style-type: none"> – Risks of surgery – Time off work – Long rehabilitation – \$\$ |
|--|--|

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More Importantly!

What are the risks of Nonoperative Treatment?

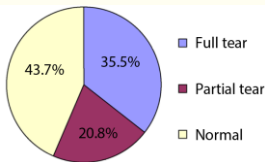
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THE DEMOGRAPHIC AND MORPHOLOGICAL FEATURES OF ROTATOR CUFF DISEASE

A COMPARISON OF ASYMPTOMATIC AND SYMPTOMATIC SHOULDERS
By KEVIN YAMAGUCHI, MD, KRISTENTONEN DENSON, MD, WILLIAM D. MISSELETON, MD, CHARLES F. HILLBERRY, PhD, LEESA M. GALATZ, MD, AND STEPHEN A. TRIFLETI, MD
Investigation performed in the Department of Orthopaedic Surgery and the Department of Diagnostic Radiology, MRF Institute of Radiology, Barnes-Jewish Hospital, Washington University School of Medicine, St. Louis, Missouri

588 patients with unilateral shoulder pain

Bilateral shoulder ultrasounds



Prevalence of tear in asymptomatic shoulders with contralateral symptomatic full thickness tear

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588 patients with unilateral shoulder pain

Bilateral shoulder ultrasounds

Cuff disease correlates with age

50% likelihood of a bilateral rotator cuff tear after age of 66

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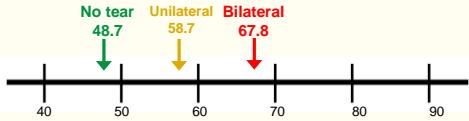
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By Ken Yamashita, MD, Konstantinos Drotos, MD, William D. Middleton, MD, Charles E. Bechtold, PhD, Leesa M. Galatz, MD, and Stephanie A. Teffs, MD
Investigation performed at the Department of Orthopaedic Surgery and the Department of Diagnostic Radiology, Hill Institute of Pathology, Hermon-Jacobi Hospital, Saintagene University School of Medicine, St. Louis, Missouri

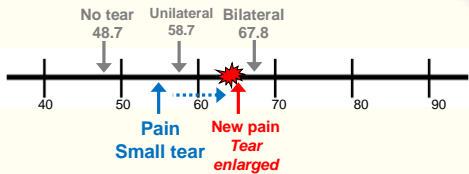
588 patients with unilateral shoulder pain
Bilateral shoulder ultrasounds

Cuff disease correlates with age



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Increase in cuff disease with age



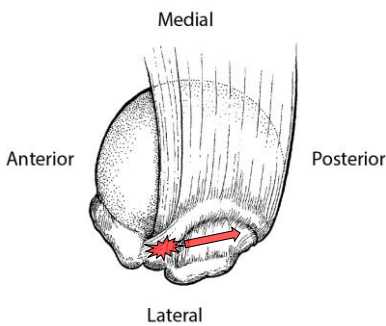
Decrease in cuff healing with age

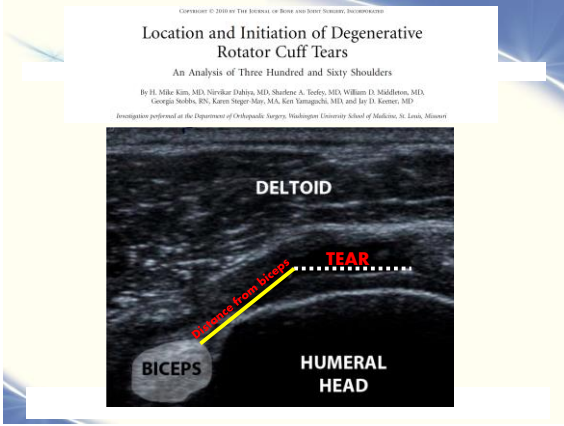
1. Risk of tear enlargement?
2. Risk of fatty muscle degeneration?
3. Risk of alterations to glenohumeral kinematics?

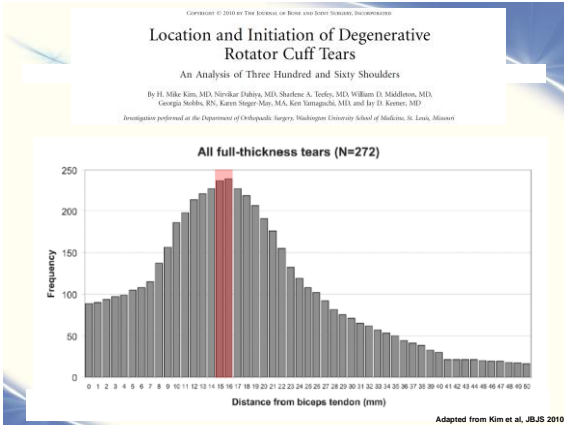
Risk of **irreversible changes** dictate urgency for surgery

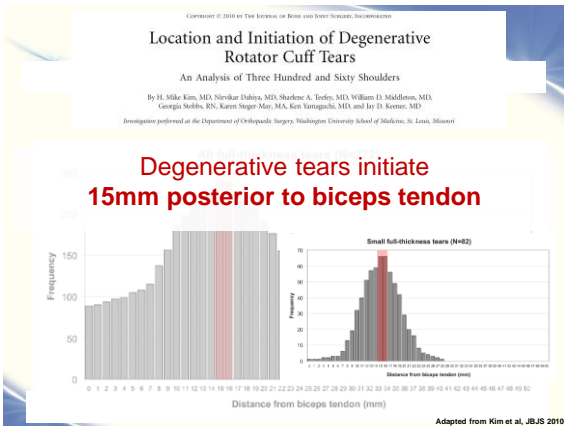
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Tear Initiation (Old Dogma)

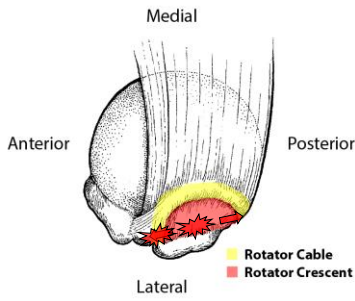






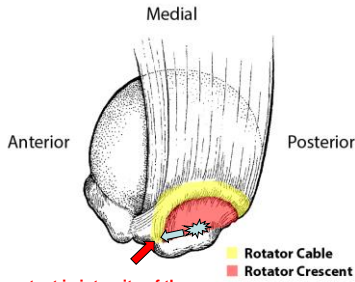


Tear Initiation



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Tear Size and Location



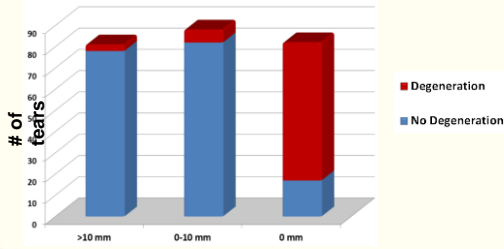
How important is integrity of the anterior cable / anterior supraspinatus?

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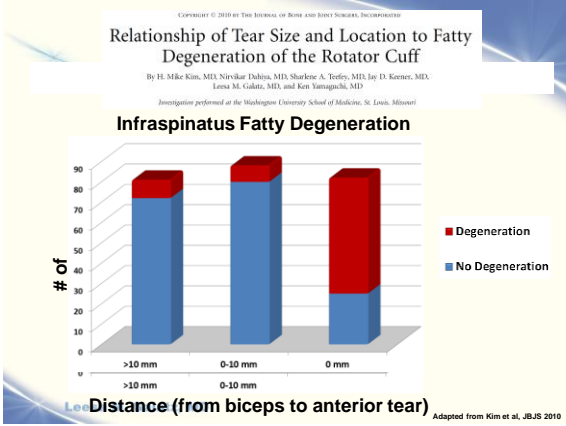
Relationship of Tear Size and Location to Fatty Degeneration of the Rotator Cuff

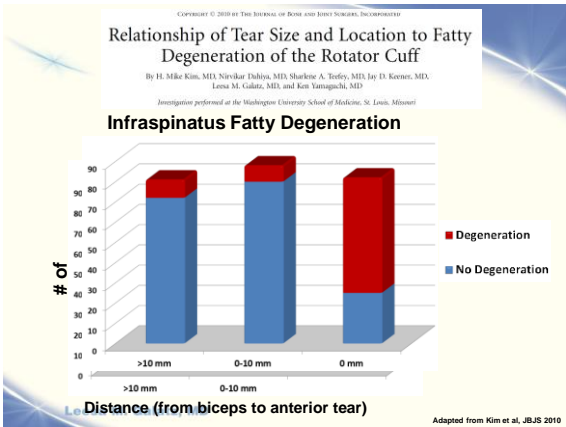
By H. Mike Kim, MD, Nirvikar Dhabia, MD, Sharlene A. Trofey, MD, Jay D. Keener, MD, Leesa M. Galatz, MD, and Ken Yamaguchi, MD
Investigation performed at the Washington University School of Medicine, St. Louis, Missouri

Supraspinatus Fatty Degeneration



Adapted from Kim et al., JBJS 2010





Integrity of anterior supraspinatus tendon important to development of fatty degeneration

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Longitudinal Survivorship

Prospective longitudinal study

Purpose: to report long-term risk of tear enlargement and symptom progression

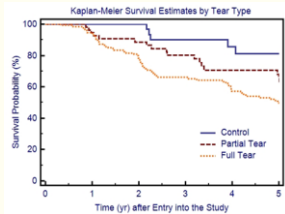
224 patients
(118 full, 56 partial, 50 controls)

Enrolled over 12 years

Annual U/S, x-ray, clinical evaluation

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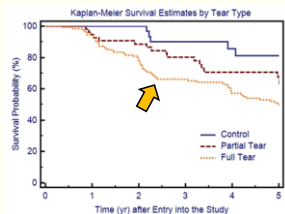
Longitudinal Survivorship



49% of all tears enlarged >5mm at median 2.8 years
Development of pain associated with enlargement

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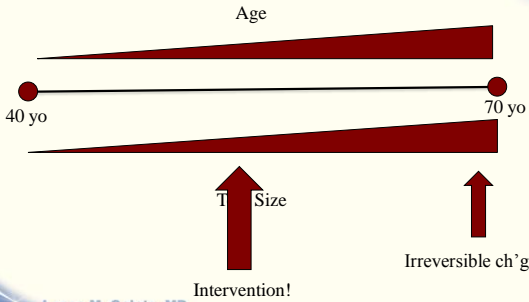
Longitudinal Survivorship



Full thickness tears more likely to enlarge (61%)
Full thickness tears associated with muscle degeneration

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Rotator Cuff Tears



Treatment Rationale

	Surgical	Conservative
Age	<60	>65
Tear size	Larger	Smaller
Tear location	Involves anterior supra	Crescent tear
Tear type	Full-thickness	Partial-thickness

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Thank you