

ROTATOR CUFF TEARS – REHAB OR SURGERY: WHAT IS THE EVIDENCE TELLING US



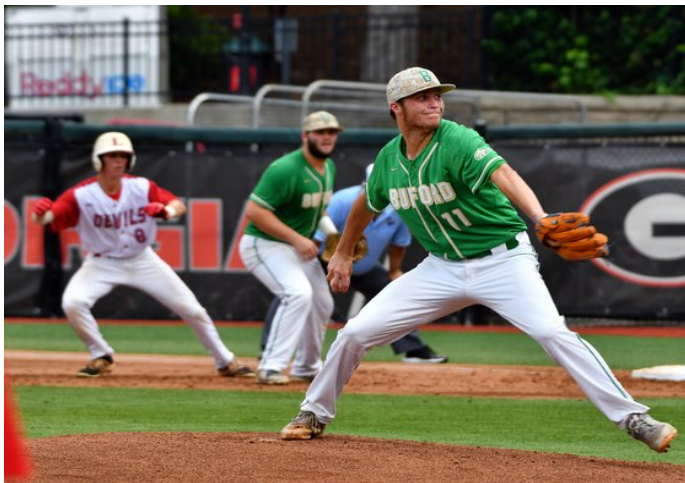
Michael Newsome PT, OCS, SCS, CSCS

RC TEARS – REHAB OR SURGERY

- RC tears are the most frequent tendon injury in the adult population
- Spectrum of RC injuries
- RC is subject to an inherent degenerative process similar to thinning and graying of the hair (Teunis 2014)
- Older adults have atraumatic RC tears from overuse and long standing degeneration. Patients under 40 have traumatic full thickness tears or elite throwers with partial thickness tears stemming from chronic overuse (Lazarides 2015)

RC TEARS – REHAB OR SURGERY

- Factors to consider
 - Partial or full thickness tear
 - Traumatic or atraumatic tear
 - Age
 - Athletes: competitive/recreational/overhead



PREVALENCE OF RC TEARS

- Prevalence of RC tears increases with age (Teunis 2014)
 - 9.7% < 20 years old
 - 62% > 80years old
- Asymptomatic shoulders (Kim 2009)
 - 0% between 40-49
 - 10% between 50-59
 - 20% between 60-69
 - 40% between 70 79

PREVALENCE OF RC TEARS

- 47% of university baseball players have partial RC tears but does not cause shoulder pain or weakness (Mihata 2019)
- 4% of college football players had RC tears at the 2004 NFL combine (Kaplan 2005)



NATURAL HISTORY OF RC TEARS

- Athletes
 - No partial RC tears progressed to full thickness tears 15 years after retirement in professional team handball players with a mean age of 30 (Schar 2018)
 - MRI findings of asymptomatic shoulders in elite overhead athletes with a mean age of 26 showed that 40 % of dominant shoulders had partial or full thickness tears and 0% in the nondominant shoulders. None of the athletes had any subjective symptoms or required any treatment 5 years after MRI (Connor 2003)



NATURAL HISTORY OF RC TEARS

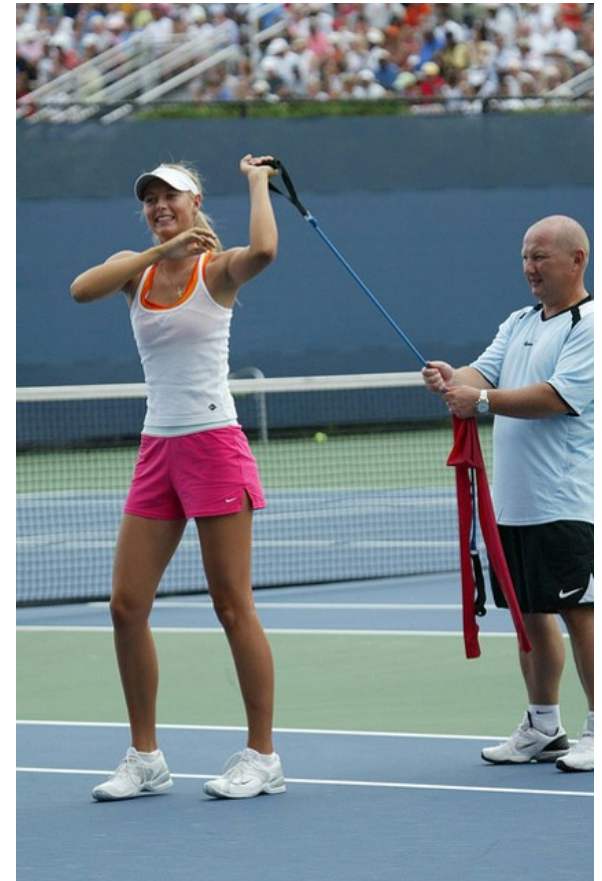
- Asymptomatic shoulders
 - 18 % of asymptomatic full thickness tears and 40% of partial tears showed progression at 2 year F/U. Pain development in shoulders with an asymptomatic tear is associated with an increase in tear size. Average age 63 (Mall 2010)
 - 36% of asymptomatic RC tears developed shoulder symptoms at 3 year F/U. There was an increase in tear size with the symptomatic group (10.6mm) compared with the asymptomatic group (3.3mm) (Moosmayer 2013)
 - 5 year F/U of asymptomatic patients reveal tear enlargement (>5mm) in 61% of FT tears, 44% in PT tears and 14% in controls. The presence of tear enlargement was associated with onset of new pain. Average age 62 (Keener 2015)

NATURAL HISTORY OF RC TEARS

- Symptomatic shoulders
 - At a mean F/U of 19 months 16% of high grade PT tears (>50%) increased in size. Average age 62 (Kong 2019)
 - At a mean F/U of 20 months 52% of the FT tears increased in size compared to 8% of the PT tears. Only 17% of the patients who were 60 yrs old or less got worse compared to 54% of the patients over 60. Average age 58 (Maman 2009)
 - At a mean F/U of 29 months 49% of the tears increased in size, 43% had not changed and 8% decreased in size. Patients treated nonoperatively should be routinely monitored for tear progression if they remain symptomatic. Average age 54 (Safran 2011)
 - At a mean F/U of 24 months 82% of FT tears and 26% of PT tears increased in size. Average age 63 (Kim 2017)
 - In a systematic review showed that 40% of asymptomatic FT tears progress at average F/U of 46 months and 34% of symptomatic FT tears progress at average F/U of 37 months (Kwong 2019)
 - In a systematic review the development of symptoms and anatomical deterioration are often correlated. F/U is necessary to avoid irreparable stage of RC tear (Eljabu 2015)

NONOPERATIVE RC REHABILITATION

- Nonoperative treatment is indicated for the initial treatment of partial RC tears in overhead athletes (Liu 2018)
- RC repair after 6 months of nonoperative treatment for partial thickness RC tears showed superior functional outcomes compared to immediate repair. A trail of nonoperative care is reasonable and immediate surgical repair is not crucial for treatment of partial thickness RC tears (kim 2018)



NONOPERATIVE RC REHABILITATION OUTCOMES

- PT for 6-12 weeks is effective for treating symptomatic atraumatic, small/medium RC tears in 75% of patients at 2 year follow up. Patients elected to undergo surgery less than 25% of the time with the majority deciding to have surgery between 6-12 weeks. Average age 62 (Kuhn JSES 2013)
- Patients decision to undergo surgery is influenced more by low expectations regarding effectiveness of PT than by pt. symptoms or RC size (Dunn 2016)
- Modifiable factors in patients with symptomatic, atraumatic RC tears (Harris AJSM 2012)
 - ST Dyskinesis
 - FF and abduction ROM
 - FF and abduction strength
- 88% of RC tears that were treated with medication, injection and PT had no pain or only slight pain and 70% had no problems with ADLs at 13 year follow up. Average age 62 (Kijima JSES 2012)

NONOPERATIVE RC REHABILITATION

- What does nonoperative rehab look like? (Kuhn 2013)
 - Stretching
 - RC/Scapular strengthening
 - Manual therapy (STM/Jt. Mob to GH, scapula and thoracic spine)



NONOPERATIVE RC REHABILITATION FOR OVERHEAD ATHLETES

- Dynamic joint stabilization
 - Axial loading with CKC exercises
 - Upper body balance exercises
- Reactive neuromuscular control exercises
 - Plyometrics
 - Perturbation training
 - Body blade
- Sports specific training



RC REPAIR OUTCOMES

- Structural defects after RC repair range from 13-94% (Dodson 2010)
- Evidence suggests that patients with a healed tendon have better RC strength than those with repeat tears (Narvani 2020)
- Outcomes are improved whether or not the repair restored the integrity of the RC (McElvany 2015)



RC REPAIR RETURN TO SPORT IN ATHLETES

- Shoulder surgery on MLB players showed about 30% involved the RC with 84% of them were debrided. Overall RTS rate was 63% (Chalmers 2019)
- Debridement of small partial thickness RC tears in professional baseball pitchers showed that 76% RTS but only 55% were able to return at same level or higher (Reynolds 2008)
- RC repairs on adolescent athletes had a 93% RTS rate at the same level but in overhead athletes 64% had to switch positions (Azzm 2018)
- FT RC repairs in 16 professional baseball players only one pitcher and one position player was able to return to professional baseball (Mazoue 2006)
- Systematic review on RTS after RC repair (average age 42) showed 85% RTS with 66% at same level. Only 50% of professional and competitive athletes returned to same level of play (Klouche 2015)
- Systematic review on RTS after RC repair showed 73% of recreational and 61% competitive athletes were able to return to same level of play. A subset of baseball and softball players showed the only 38% return to the same level of play (Altintas 2019)

RCT ON REHAB VS. SURGERY

- Moosmayer (2010, 2014, 2019) showed no significant difference in outcomes (Constant score and ASES) at 5 years but 10 year follow up favored the surgical group
 - Atraumatic/traumatic, small/medium size RC tears
 - Average age 60
 - Retear rate of 34% at 10 years
 - 41% of rehab group had >10mm tear enlargement
 - 27% of rehab group crossed over to surgery

RCT ON REHAB VS. SURGERY

- Kukkonen (2014, 2015) showed no significant difference in Constant score between PT, acromioplasty/PT, RC repair/acromioplasty/PT at 2 year follow up
 - Atraumatic supraspinatus tear
 - Average age 65
 - Crossover to surgery was 3%
 - No significant RC tear progression in nonrepaired groups

RCT ON REHAB VS. SURGERY

- Heerspink (2015) there was no difference in functional outcomes between RC repair and conservative treatment (PT, injection, medication)for degenerative RC tears at one year
 - Average age 60
 - Atraumatic small RC tears
 - 73% retear rate



RCT ON REHAB VS. SURGERY

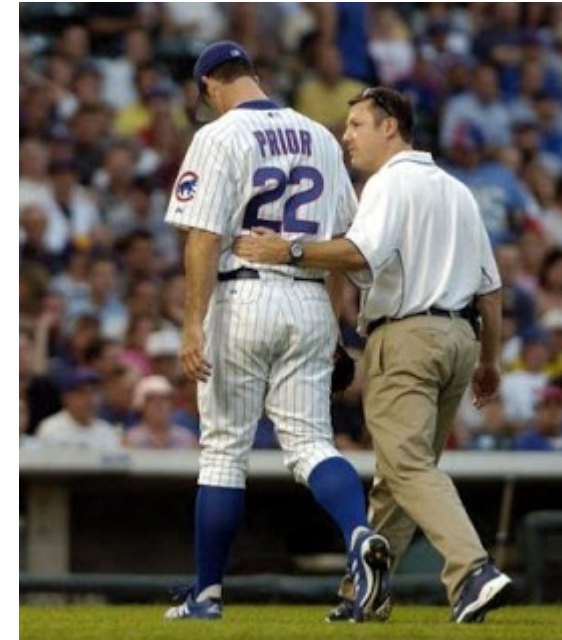
- Ranebo (2020) found no significant difference in clinical outcomes between RC repair and PT at 12 months for small, acute, **traumatic RC tears**
 - Average age 60
 - Retear rate was 6.5%
 - Tear progression was >5mm in 30% of PT group
 - Average tear size was 9.7mm

FOOD FOR THOUGHT

- Concern that a RC tear will progress in size is one of the reasons why surgical repair is considered at an early stage
- RC tears are prevalent, affecting at least 10% of population > 60 years old in US
- That would mean that more than 6 million people in US have RC tears
- About 250,000 RC repairs performed in the US each year (Colvin 2012)
- Means that fewer than 5% of population with a RC tear in the US undergoes surgery each year

KEY POINTS

1. Partial RC tears should be treated nonoperatively in all groups of patients for 12 weeks
2. Small to medium full thickness, atraumatic RC tears
 - Start with rehab for 12 weeks
 - If improvement but recurrence of symptoms (pain, weakness or loss of active elevation) then return to physician because of concern about tear progression
 - If no improvement with rehab then return to physician (no harm waiting 3-6 months for surgery)
 - Athletes/overhead athletes?
3. Traumatic RC tears
 - Acute traumatic do better than nontraumatic with RC repair surgery (Braune 2003)
 - Small, acute, traumatic RC tears will improve with PT (Ranebo 2020)
 - Athletes/overhead athletes?



THANK YOU

