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Return to Work and Sport after Rotator Cuff Repair



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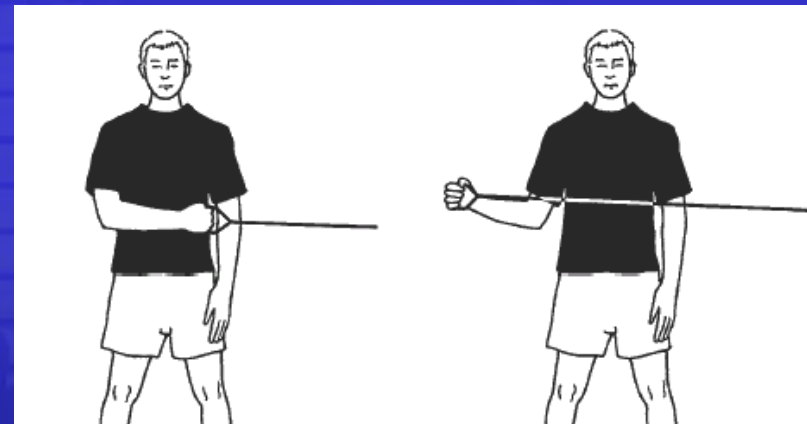
Symptoms of Rotator Cuff Repair

- Shoulder pain
- Difficulty Sleeping
- With or without injury
- Weakness
- Difficulty with overhead use



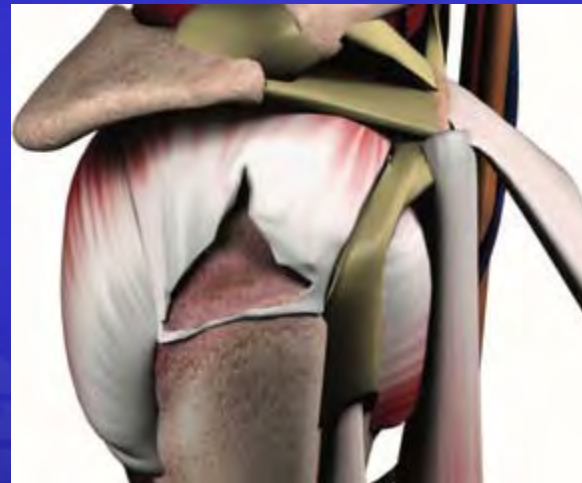
Treatment of Rotator Cuff Tear

- Physio
 - Partial rotator cuff tears
 - Chronic full thickness tears
 - Elderly, less active



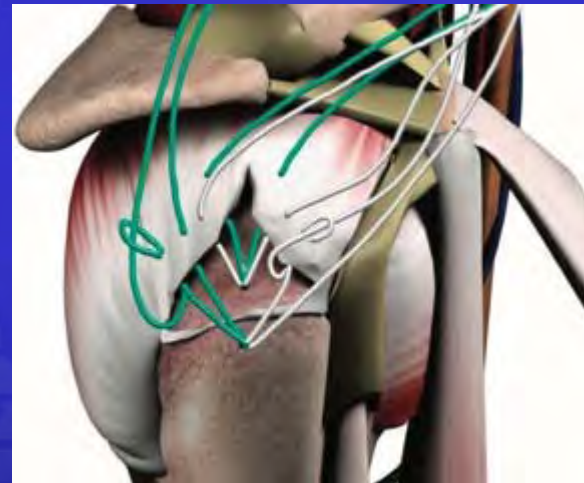
Treatment of Rotator Cuff Tears

- Surgical Treatment
 - Fail non-operative treatment
 - Acute full thickness rotator cuff tears
 - Younger, active patients
- Full thickness tear
 - Complete detachment of tendon/muscle



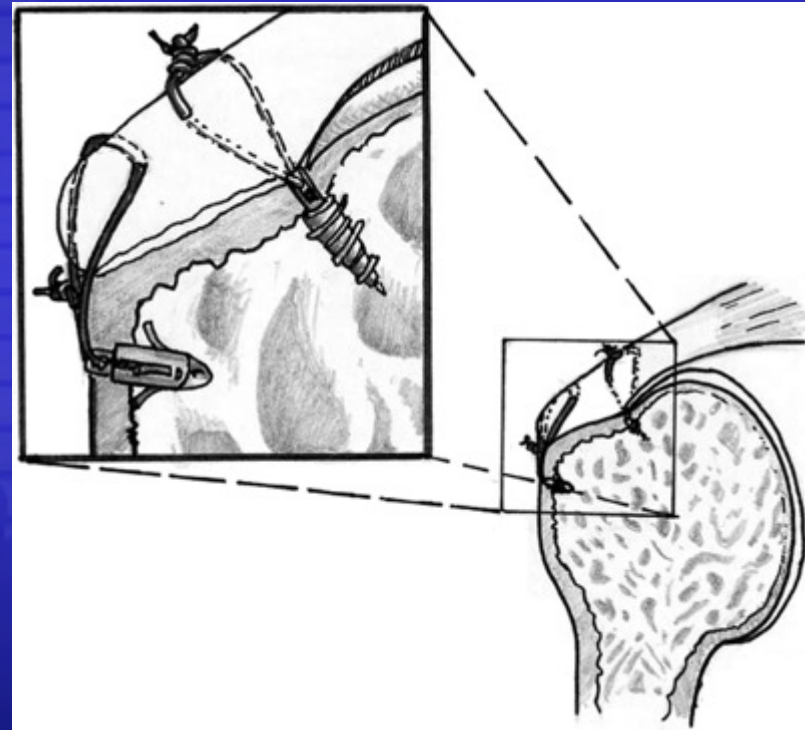
Surgical Treatment

- Shoulder arthroscopy
- Preparation of the greater tuberosity
- Anchors in bone
- Unbreakable sutures
- Suturing of the rotator cuff



Goals of Rotator Cuff Repair

- Initial strength of the repair
- Keep Rotator cuff apposed to bone
- Eventual biological healing of tendon to bone
- Restoration of strength and function



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How do we optimize environment to improve outcomes?

- Early On
 - Mechanical Strength
 - Strong anchors
 - Strong sutures
 - Prevent pull-out of rotator cuff tissue
 - LIMIT ACTIVE MOTION
 - EVEN LIMIT PASSIVE MOTION

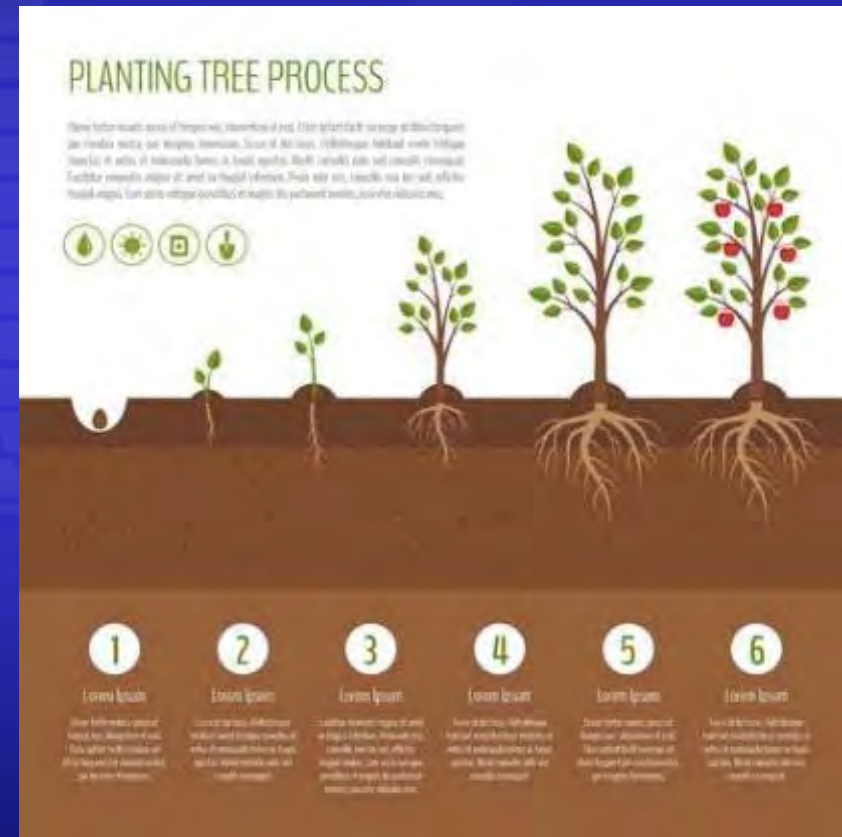


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Rely on Biological Healing to improve strength

- Time Zero
 - No biological healing
- Must allow time for healing of rotator cuff attachment
- Growth of attachment leads to strength
- Like mature roots in soil.



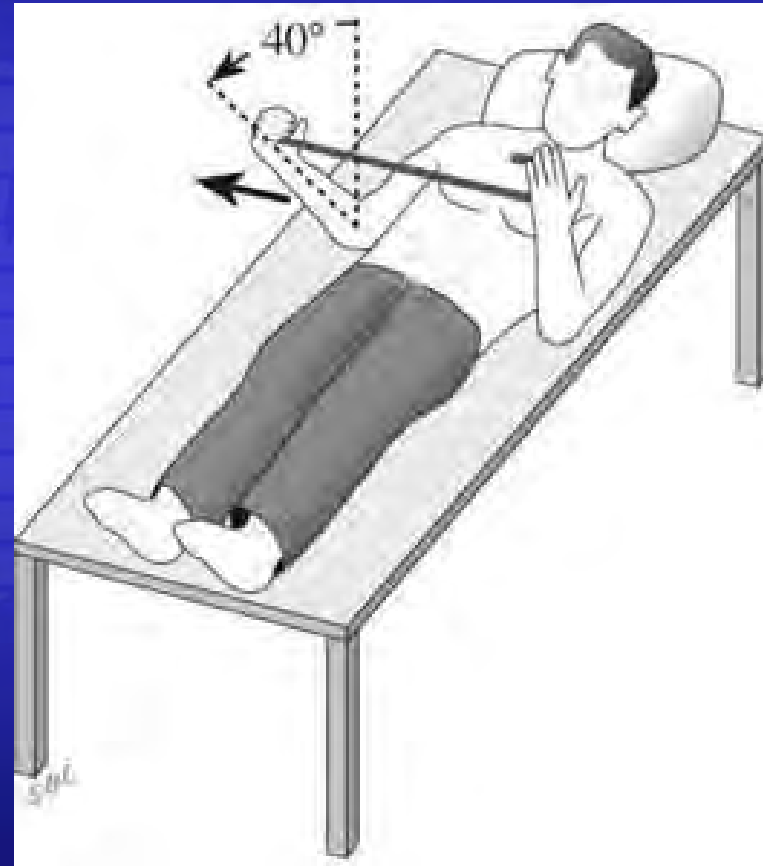
Rotator Cuff Healing

- Sonnabend et al. JBJS 2010
 - Studied healing of rotator cuff repair in baboon
 - Sharpeys fiber's develop at 12-15 weeks, maturation
 - Limit strengthening until this time.



Limited Rehab Protocol

- 0-6 weeks- Sling only, Passive ER, no FF
- 6-12 weeks- full passive ROM, no strength, active to shoulder
- 12 weeks begin strength, therabands
- 6 months- full activity



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Does this plan work?

- Re-tears occur after rotator cuff repairs
- 10%-94% re-tears
- Interestingly good outcomes achieved
- Evidence of weakness in re-tear group.
- Robinson, Lam, JSES, 2017.
- Galatz, Ball. JBJS (A) 2004.
- Kim, Shin. JBJS 2012.



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Re-tears

- Revision rotator cuff repairs, 2 year follow up.
- 52% re-tear rate
- Related to patient age and size of original tear
- Retears had poorer outcomes and reduced strength.
- Keener, Wei, Galatz, JBJS 2010.



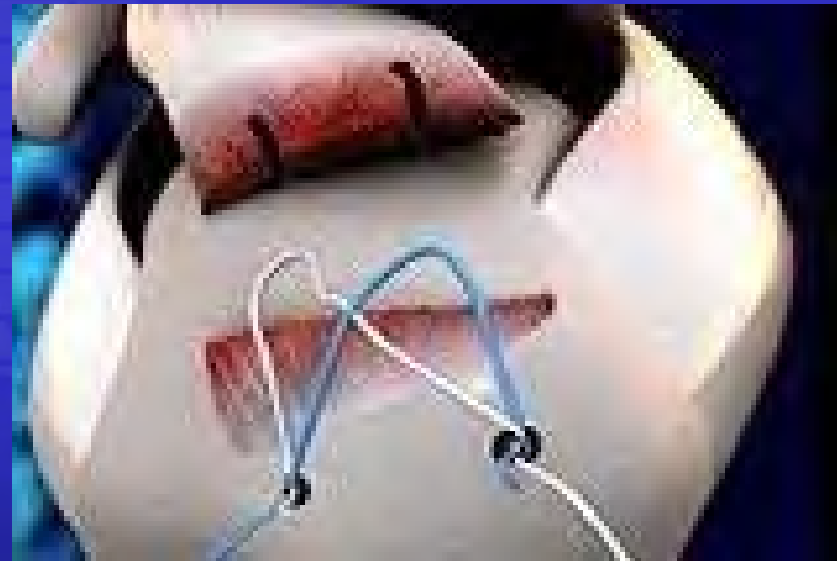
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Conclusions

- We are still getting significant re-tears of the rotator cuff with current techniques
- Re-tears lead to weakness and potentially poorer outcomes
- Perhaps improve biology



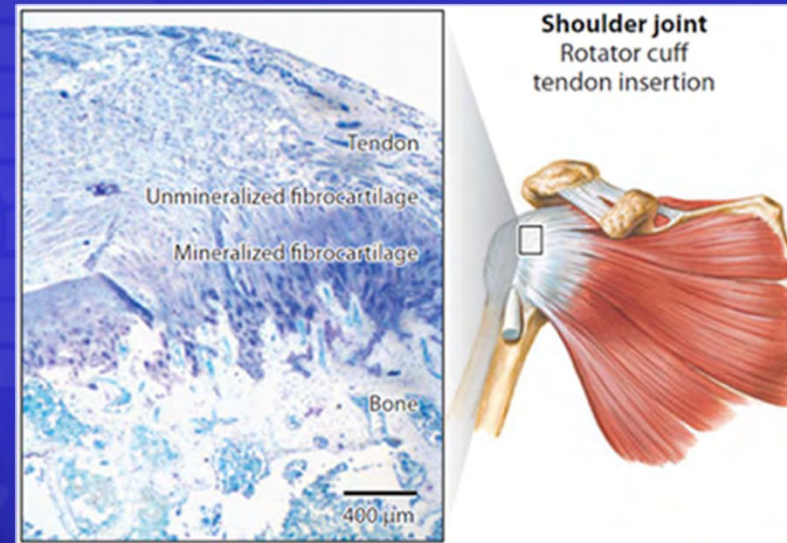
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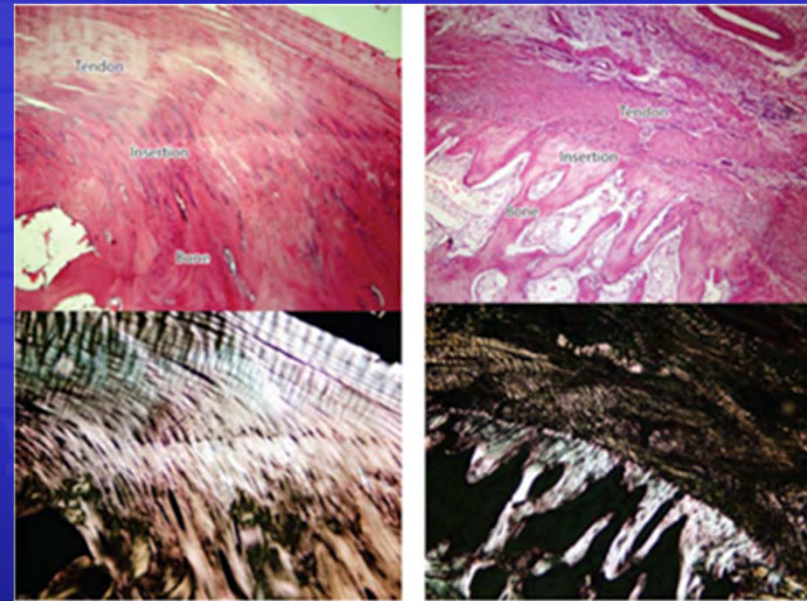
Tendon Bone Healing

- Normal layers of enthesis
 - Tendon
 - Unmineralised fibrocartilage
 - Mineralised fibrocartilage
 - Bone



Rotator cuff healing

- Healing tendon to bone is NOT like original.
- Mechanically inferior.
- Can we improve the biology of the attachment?



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Current studies to enhance Biology- enhance integrity

- Recent studies are done on rats
- Assess repair integrity biologically
- Results with FGF, IGF-1, mesenchymal stem cells, bone marrow stimulation all promising



PRP injections- No Benefit

- Prospective RCT trials
- Humans
- No differences in MRI structural integrity, and NO differences in functional scores
- Did NOT improve early tendon-bone healing.



Patient Population

- Broad Range Activity Levels
 - Sedentary Work
 - Athletes
 - Workers Comp
- Differences:
 - Goals
 - Expectations
- May lead to different outcomes



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Athletes have higher demands



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Pat Rafter

- No 1 ranking in 1999
- US Open titles 1997 and 1998
- Runner up Wimbledon 2000 and 2001
- Claim to Fame??
- Only player undefeated against Roger Federer 3-0



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Pat Rafter

- Rotator cuff tear in 1999
- Underwent surgery
- Retired from tennis 2001
- Unable to return to level of play



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Baggage Handlers

- Routine lifting 23 to 32 kilograms
- Pushing
- Pulling
- Bending
- Stooping



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What is different about return to sport and Work?

- Higher Expectations
 - Strenuous activity
 - Explosive movements
 - Maintain strength and ability to lift
 - Use arms overhead work
 - Repetitive movements



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Athlete and Worker Time Pressure

- Desire to return to pre-injury level as soon as possible
- We must respect healing rates of tendon to bone
- Optimize reattachment
- Maximise chances
- Avoid re-tears



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Can athletes return to SPORT after rotator cuff repair?

- Under 70 years old
- Sling 4 weeks, strength at 3 months
- Tennis, swimming, golf
- 86% returned to sport
- Mean time 6 months
- Stabilisation 11 months
- Antoni and Klouche, et al. Ortho and Traumatology, 2016.



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Return to Sport

- 80% return at equal or higher level compared to before surgery
- 20% returned at an inferior level of play.
- Antoni and Klouche, et al. Ortho and Traumatology, 2016.



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Return to Sport

- Metanalysis
- 26 studies reviewed, 860 patients, mean 3.5 yr follow up.
- Return to sport 85%
- 66% equivalent level
- 4 to 17 months
- Only 50% in competitive athletes
- Klouche, Lefevre, Am Journal Sports Med, 2016.



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Return to sport

- 51 tennis players, 4 yr follow up
- 80% able to return to tennis
- Average 10 months after surgery
- Sonnery-Cottet, Edwards. Am Journal Sport Med 2002



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Summary

- About 80% return to sport
- 6 months to return
- Up to 17 months to stabilize
- Harder challenge for competitive athletes (50%)



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Return to WORK after rotator cuff repair

- 254 patients
- 60% return to work
- Type of work did NOT affect return, just time away from work
- AGE >55 big factor
 - Retirement
- Outcome, symptoms prevented return to work
- Nove-Josserand, Liotard. Ortho and Traumatology, 2011



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WC patients did worse than non WC?

- Looked at WC vs. non WC.
- WC had lower recovery in all outcomes
- When factored in that WC were smokers and larger tears, outcomes were more equal
- Balyk, Luciak-Corea. Clin Ortho Rel Research, 2008.



WC do worse because WC?

- Took into account age, sex, smoking, work demands, tear size, education levels.
- Even when accounting for all of these factors WC patients did worse overall.
- Supports WC do worse
- Henn, Kang, JBJS 2008



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Return to Work- Compliance

- WC patients demonstrated high non-compliance 52% compared to nonWC (4%)
- When WC patients were compliant, far better outcomes
- Cuff, Pupello. J Shoulder Elbow Surgery 2012



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Summary

- WC patients generally to worse than non-WC patients
- NOT due to increase activity level
- Other issues around WC – compliance? biopsychosocial?
- Type of work did not affect return to work



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What can we do to help return to level of work and sport?

- Respect the rehabilitation process
- Better compliance
- Better communication with employers
- Time to healing
- Prevent re-tears



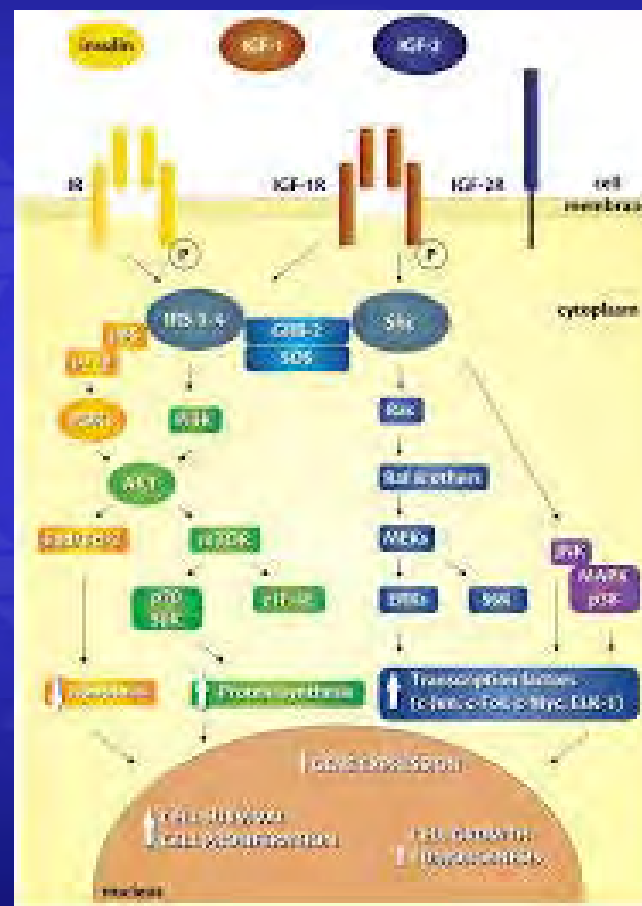
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Future

- Biological enhancement of rotator cuff repair
- Prevent re-tears
- Improve overall strength



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Thank you



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