

# Editorial Commentary: Overtensioning of Rotator Cuff Tear Repair Predisposes to Failure of Complete Healing



Bum Jin Shim, M.D., Ph.D.

**Abstract:** Overtension repair of rotator cuff tear may predispose to the failure of postoperative integrity of the rotator cuff tendon. Surgeons should consider the size of the rotator cuff tear and maintain adequate tension for successful rotator cuff repair. Feel the tension on the tendon: too much can poison the outcome.

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The topic of “repair tension” for rotator cuff tear remains a challenging subject. Takeda, Fujii, Suzue, Miyatake, Kawasaki, and Yokoyama recently published a study titled “Repair Tension During Arthroscopic Rotator Cuff Repair is Correlated With Preoperative Tendon Retraction and Postoperative Rotator Cuff Integrity.”<sup>1</sup> In their study, intraoperative repair tension is correlated with tear size in the mediolateral direction and is effective for predicting rotator cuff integrity postoperatively. They found that cutoff value of repair tension for retear after surgery was 26.0 N for medium-to-massive full-thickness tears and 35.6 N for large-to-massive tears. Although there was some argue of validity of the tensiometer that authors used, they thought that the cutoff value is not the definite value to determine the fate of a repaired tendon. In my opinion, Takeda et al. should be congratulated for finding correlations between intraoperative repair tension and preoperative factors as well as postoperative rotator cuff integrity. This work allows us to consider the tension as a significant factor for rotator cuff repair.

Various studies have dealt with the effect of repair tension and the fact that tension affects the healing rate of the tendon after repair is well known.<sup>2</sup> It seems obvious that overtension at the time of surgery will

adversely affect the rotator cuff repair integrity. However, further research may be needed on the criteria of “over.” The strength of tendon repair changed considerably according to amount and direction of the tension. In my experience, measuring repair tension and taking a direction of tension are not easy work and require a lot of experience. I think the sensation in the hand (or finger) is important when measuring the tension and taking a direction. If you measure the repair tension every time when you perform surgery, you can feel how much tension is applied to your hand (or finger) at 35N on the tensiometer and which direction is adequate for the repair. However, it will take time to get used to it. This may be time-consuming, and you should always think about the fact that patient is under general anesthesia. I don’t know how many suture anchors the authors used, but it will take long time if surgeons measure each strand tension for multiple suture repairs. If the surgery is prolonged and adversely affects the patient, it can become a “penny wise and pound foolish” situation. If the surgeons are skilled, it’s a bit vague, but it can be important to find the “feeling.”

For the understanding of this valuable study, one significant question remains. Does successful rotator cuff repair really mean rotator cuff integrity? One of the things people often mistake is to judge that failure means structural discontinuities. Although many studies suggest that intact repairs can be associated with significantly better clinical outcomes compared with retears, unlike other parts such as the hand or knee, maintaining the balance of “force couple” is critical in the shoulder. Although this study excluded the patients with a partial repair, partial reattachment of the rotator

Hallym University Chuncheon Sacred Heart Hospital

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cuff tendons provides significant clinical improvement, especially in chronic or massive rotator cuff tears. Even if there are structural discontinuities, it can show satisfactory clinical outcomes such as pain score, functional score, patient's satisfaction, and so on. Therefore, I think, in addition to the relationship between repair tension and structural assessment, correlation with clinical outcome is necessary.

There is a maxim "To go beyond is as wrong as to fall short." Of course, tension shouldn't be too little. Although it may be difficult, the most important thing is that too much is as bad as too little. Too much tension will kill the tendon! It is important to keep the tension "adequate."

I hope that shoulder surgeons worldwide continue to have the opportunity to think about how to reduce the

repair tension for rotator cuff tear surgery in their own way. As with "proper social distancing" in the COVID-19 pandemic period, it will be important to maintain the adequate relationship between "tension and tendon."

### References

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