Editorial Commentary: Choose Wisely: Rotator Cuff All-Suture Anchors

Michael P. McCabe, M.D., Editorial Board

Abstract: The defining feature of a surgeon's professional practice is clinical decision making coupled with surgical execution. Surgeons' decisions are continually being scrutinized, and clinicians are trained to consult and interpret the peer-reviewed literature in formulating a treatment plan. An important decision in the surgical episode of care is which implant(s) will be used, and surgeons should feel comfortable defending their implant choices. Understanding the finer details of a bench study is important in formulating a clinical opinion of a biomechanical investigation of surgical implants. The biomechanical properties of diverse brands of all-suture rotator cuff anchors are not significantly different. However, all-suture rotator cuff anchors require further comparison with traditional rotator cuff suture anchors in geriatric patients who potentially have osteoporosis.

See related article on page 2805

I was recently offered the "opportunity" for a peer-to-peer conference on a denied surgical preauthorization. Unfortunately, this is a familiar experience for all clinicians, but this particular situation actually required 2 separate peer-to-peer calls with 2 different companies for the same patient's operation. This added wrinkle doubled the workload on me and my staff (while presumably increasing the likelihood of a successful denial for the insurance company by some measurable amount). The list of grievances with the peer-to-peer process is likely similar among providers—added staff workload, scheduling inefficiencies, lost productivity, time wasted, and so on—but it seems the most aggravating aspect of this tedious part of clinical practice is the feeling that our ability to recommend what we think is best for our patients is being annexed by a third party with a financial conflict of interest. Ultimately, the peer-to-peer process threatens our control over clinical decision making.

As surgeons, we have a right to feel defensive of our abilities to recognize a clinical problem, build rapport with a patient, educate him or her on treatment options, make a recommendation, and finally, use our years of training to maximize the chance of a successful outcome. Those decisions that we make throughout the episode of care—preoperatively, intraoperatively, and postoperatively—make up the essence of our profession. It is within these nuanced decisions where the clinician thrives and the insurance approval algorithm fails.

In fact, the *Arthroscopy* home page highlights the importance of the choices a surgeon makes in his or her practice: "Every issue [of *Arthroscopy*] enables you to put into perspective the usefulness of the various emerging arthroscopic techniques. The advantages and disadvantages of these methods—along with their applications in various situations—are discussed in relation to their efficiency, efficacy and cost benefit."[1]

It is easy to view the bench study "Cyclic and Load-to-Failure Properties of All-Suture Anchors in Human Cadaveric Shoulder Greater Tuberosities" by Trofa, Ruder, Yeatts, Peindl, Habet, Saltzman, and Fleischli[2] as yet another biomechanical study showing a lack of superiority among various orthopaedic implants—in this case, 3 brands of all-suture suture anchors placed in the greater tuberosity for use in rotator cuff repair. However, it may be better to view this as non–commercially biased data to aid a surgeon's ability to choose an implant to best serve the patient's needs.

In their comprehensive discussion, Trofa et al.[2] point out that despite the advantages of all-suture anchors, "it is important to ensure that these novel anchors have sound biomechanical properties and will not lead to

The author reports no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

0749-8063/201517/$36.00
https://doi.org/10.1016/j.arthro.2020.09.009

early failure." They then synthesize their results with prior literature that suggests that all-suture anchors may be a viable choice for surgeons' clinical practice. In this case, the lack of statistically significant differences should be considered a good thing because it suggests the surgeon's choice of implant brand is not likely a major factor.

There is one major caveat regarding this particular article, though, and it directly impacts surgeon choice. The primary limitation of the study—the risk of a β error due to an underpowered study—has implications on the reliability of the results and conclusions.[2] The sample size was not determined by a power analysis but rather by the number of anchors donated by the vendors (28 each). In their March 25, 2020, revision notes to the editors, Trofa et al. reported that a post hoc analysis indicated that at 80% power, 207 to 267 samples were needed to show statistical significance (unpublished data). This would require 69 to 89 anchors per company and 35 to 45 matched pairs of cadaveric humeri—certainly a large, potentially cost-prohibitive undertaking. The authors commented, "as this is a number of samples that would be unattainable by most investigators, we have opted to omit this analysis from the manuscript" (unpublished data). I would argue that this information is critical to include in the article because I think it is important for a surgeon to be able to make his or her own calculated risk when opting for all-suture anchors based on the strength of published data, whether it be clinical outcomes or biomechanical results. The fact that the study is difficult to execute for logistical reasons is immaterial to the significance of the numbers in the post hoc calculation. Regardless, the post hoc analysis confirms that for the most part, the surgeon's choice of brand is not the issue.

However, it is important to understand that this post hoc power analysis is not for the collective biomechanical properties of this particular anchor class but rather for identifying differences among specific anchors within this class. Therefore, the more important consideration for the surgeon likely rests in the comparison of all-suture anchors to traditional solid anchors, that is, whether all-suture anchors are equal or superior to solid anchors in rotator cuff repair. In this study, the 25th to 75th interquartile ranges (and 95% confidence intervals for that matter) have load-to-failure values that fall below the recommended threshold of 250 N as reported by Mazzocca et al.[3] and cited by Trofa et al.[2] in their article. This finding suggests that some all-suture anchors may not be ideal for this application.

Furthermore, these data may actually report a best-case scenario because the age range of specimens was surprisingly young, at 48 to 68 years, with an average age of 56.3 years. In the oldest specimen, aged only 68 years, all 6 anchors failed "during deployment and manual preloading." This finding is worrisome because most surgeons routinely perform rotator cuff repair in patients older than 70 years, and we cannot infer from this study whether our senior patients have adequate bone quality for this type of fixation. From this perspective, the details within the study by Trofa et al.[2] suggest that surgeons should choose very carefully in whom they elect to use all-suture anchors for rotator cuff repair.

Considering the huge amount of data already being generated and harvested within the surgical arena and others, it is not hard to imagine a scenario in which is it routine for a surgeon not only to have to justify clinical decisions via a peer-to-peer process but also to defend the selection of particular surgical implants via a similar mechanism. Indeed, reports of a similar nature are already being produced on clinicians and used under the designation of "quality measures." In an era in which our decisions are increasingly being scrutinized by all entities involved in the surgical episode of care, surgeons need to be capable of defending those choices "in relation to their efficiency, efficacy and cost benefit."[1] Open critical assessment of clinical studies and bench research in the peer-reviewed literature will continue to help us achieve proficiency in this aspect of our practices as well.

References

1. About the Journal. *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. https://www.arthroscopyjournal.org/content/aims. Accessed September 6, 2020.
2. Trofa DP, Ruder JA, Yeatts NC, et al. Cyclic and load-to-failure properties of all-suture anchors in human cadaveric shoulder greater tuberosities. *Arthroscopy* 2020;36:2805-2811.
3. Mazzocca AD, Millett PJ, Guanche CA, Santangelo SA, Arciero RA. Arthroscopic single-row versus double-row suture anchor rotator cuff repair. *Am J Sports Med* 2005;33:1861-1868.