

## Could Disruption of the Shoulder Superior Capsule Be the “Essential Lesion” of Rotator Cuff Disease? Possibly, but Questions Remain...



**Abstract:** Rotator cuff disease remains a complex clinical problem with significant variation in pathology, clinical presentation, and management options. Functionally, humeral head depression is critical in restoring or maintaining arm elevation, and the shoulder superior capsule serves in this important function. Could disruption of the shoulder superior capsule be the “essential lesion” of rotator cuff disease? Possibly, but many questions remain unanswered, and substantial scientific evidence is required before we can assert with certainty that disruption of the superior capsule with resultant superior instability of the humeral head is the essential lesion of rotator cuff disease.

Rotator cuff disease remains a treatment challenge for orthopaedic shoulder surgeons.<sup>1-15</sup> Specifically, limited surgical options are available for younger patients with large, functionally irreparable tears with minimal arthritis. Recently, there has been significant interest in superior capsular reconstruction (SCR) as a management option for this difficult patient group.<sup>16-23</sup>

In their expert opinion article “The Rotator Cuff and the Superior Capsule: Why We Need Both,” Adams et al.<sup>24</sup> boldly declare that disruption of the superior capsule with resultant superior instability of the humeral head is the “essential lesion” of rotator cuff disease. The authors make a cogent argument supporting their thesis, and the article, found in this month’s issue, is not to be missed.

Essential lesion? This obvious reference by Adams et al.<sup>24</sup> is to Bankart,<sup>25</sup> who is often credited for identifying a lesion of the anterior, inferior shoulder glenoid as the “essential lesion” of anterior shoulder dislocation. To be fair, however, Bankart’s observation has stood the test of time (since 1923), whereas only time will tell if the bold declaration of Adams et al. that disruption of the superior capsule is the essential lesion of rotator cuff disease will prove true when judged over the years.

One thing that is for certain—as Adams et al.<sup>24</sup> acknowledge—is that at this point in the debate, support for SCR is largely based on expert opinion, as we await publication of supportive clinical outcome data. We also note that Adams et al. have significant, and appropriately disclosed, commercial conflicts of interest that could bias their opinions. To be fair, however, SCR does not appear to be a “single-company technique,” as the SCR could be

performed with instruments and implants available from more than one company. In addition, as we cover all bases, readers are urged to review the instructive and well-prepared technical note with video “Arthroscopic Superior Capsular Reconstruction for Massive Irreparable Rotator Cuff Repair” by Burkhart et al.<sup>26</sup> in this month’s *Arthroscopy Techniques* ([www.arthroscopytechniques.org](http://www.arthroscopytechniques.org)), our companion journal. Likewise, readers may read and view previously published *Arthroscopy Techniques* articles regarding SCR by Tokish and Beicker,<sup>17</sup> Petri et al.,<sup>20</sup> and Hirahara and Adams<sup>23</sup> as cited earlier.

Returning to “The Rotator Cuff and the Superior Capsule: Why We Need Both,” Adams et al.<sup>24</sup> assert, “The superior capsule is attached to the undersurface of the supraspinatus and infraspinatus muscle-tendon units, and it resists superior translation of the humeral head... [and it is] the defect in a superior capsule that is the ‘essential lesion’ in a superior rotator cuff tear, as opposed to the defect in the rotator cuff itself.” They further “propose that rotator cuff repair must restore the normal [superior] capsular anatomy to provide normal biomechanics of the joint and thus a positive clinical outcome.”

Yet, rotator cuff disease represents a spectrum of pathologic patterns that may occur as a result of various pathologic mechanisms. In addition, there is significant variation in clinical symptoms associated with a rotator cuff tear. As Editors who are obligated to encourage and publish but also to question new ideas, and who ourselves have repaired rotator cuff tears with positive outcomes absent (knowingly) having repaired the superior capsule, we wonder: Is it really possible that there exists a single essential lesion of rotator cuff disease? And, if yes, is it likely that disruption of the superior capsule is such a lesion?

We have additional bases for such questions. Some patients have improvement in pain and function after

rotator cuff repair despite failure of the rotator cuff (and presumably the superior capsule) to heal.<sup>27</sup> Similarly, some patients who have known full-thickness tears of the superior rotator cuff (and presumably the superior capsule) may be asymptomatic.<sup>28</sup> In addition, in patients who have partial bursal-sided tears, intratendinous tears, or small full-thickness tears in which the rotator cable<sup>28</sup> (and presumably the superior capsule) remains intact, pain can be significant and functionally limiting.<sup>29-35</sup> Lastly, in reviewing the technique for SCR, Burkhart et al.<sup>26</sup> recommend the use of a dermal allograft, which may exceed the anatomic and biomechanical properties of the normal superior capsule and result in a nonanatomic functional restraint. Perhaps SCR should be confined to limited indications, as a “salvage” procedure, when more conventional rotator cuff repair options are limited.

That said, early reports of outcomes after SCR have been favorable, and we hold senior and corresponding author (and Arthroscopy Association of North America Past President) Stephen S. Burkhart, M.D., in the highest regard as an expert on this topic, for many good and obvious reasons, and as specifically evidenced by his cited publications.<sup>19,24,26,28,35</sup> Although, as with any new procedure, long-term clinical data are necessary to validate outcomes and indications, and although skepticism is required for the reasons iterated earlier, if there is an essential lesion of rotator cuff disease, it would not surprise us in the least that Dr. Burkhart and his team would be among the first, and among the most clear and compelling authors, to make the importance of SCR evident to *Arthroscopy* readers.

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If a picture is worth a thousand words, then a video is worth an entire textbook.

*Arthroscopy* has always been focused on its roots—providing practical, clinically relevant peer-reviewed information for the practicing arthroscopist. As the journal has grown, more articles have focused on higher-level research, including randomized trials, meta-analyses, and controlled studies. However, as Editors of *Arthroscopy*, we want to make sure to still provide our readers with instructional Technical Notes

and cutting-edge “pearls” that are clinically focused but peer-reviewed. In the digital age, written text alone does not equal the educational value of a multimedia presentation, hence the birth of *Arthroscopy Techniques*, *Arthroscopy's* online video companion.

When *Arthroscopy Techniques* (also known as “A-Tech”) first began in 2012, our library of articles with videos was limited. What we lacked in numbers, we made up for in quality. Each video was peer reviewed and available to the public, not just journal subscribers. The videos were then, and remain, succinct and direct: They are no longer than 4.5 minutes, and each includes a voiceover of the authors describing each step in the technique. Each video is also supplemented with a written description of the technique