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Locating the rotator cable during subacromial arthroscopy: bursal- and articular-sided anatomy

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Background: The rotator cable (RCa) is an important articular-sided structure of the cuff capsular complex that helps prevent suture pull out during rotator cuff repairs (RCRs) and plays a role in force transmission. Yet, the RCa cannot be located during bursal-sided RCRs. The purpose of this study is to develop a method to locate the RCa in the subacromial space and compare its bursal- and articular-sided dimensions.

Methods: In 20 fresh-frozen cadaveric specimens, the RCa was found from the articular side, outlined with stitches, and then evaluated from the bursal side using an easily identifiable reference point, the intersection of a line bisecting the supraspinatus (SS) tendon and posterior SS myotendinous junction (MTJ). Four bursal-sided lengths were measured on the SS-bisecting line as well as the RCa's outside anteroposterior base. For the articular-sided measurements, the rotator cuff capsular complex was detached from bone and optically scanned creating 3D solid models. Using the 3D models, 4 articular-sided lengths were made, including the RCa's inside and outside anteroposterior base.

Results: The RCa's medial arch was located 9.9 ± 5.6 mm from the reference point in 10 intact specimens and 4.1 ± 2.4 mm in 10 torn specimens ($P = .007$). The RCa's width was 10.9 ± 2.1 mm, and the distance from the lateral edge of the RCa to the lateral SS insertion was 13.9 ± 4.8 mm. The bursal- and articular-sided outside anteroposterior base measured 48.1 ± 6.4 mm and 49.6 ± 6.5 mm, respectively ($P = .268$). The average inside anteroposterior base measurement was 37.3 ± 5.9 mm.

Discussion: The medial arch of the RCa can be reliably located during subacromial arthroscopy using the reference point, analogous to the posterior SS MTJ. The RCa is located 10 mm in intact and 4 mm in torn tendons ($P = .007$) from the posterior SS MTJ. If the above 6-mm shift in location of the RCa is not taken into consideration during rotator cuff suture placement, it could negatively affect time zero repair strength. The inside anteroposterior base of the RCa measures on average 37 mm; therefore, rotator cuff tears measuring >37 mm are at risk of rupturing part or all of the RCa's 2 humeral attachments, which if not recognized and addressed could impact postoperative function.

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The rotator cable (RCa) is an important articular-sided structure within the rotator cuff capsular complex; it plays an important role in force transmission during shoulder motion and in suture pullout strength following a rotator cuff repair (RCR).[2-4,17,22,26,39] Structurally, the RCa is a semilunar band of collagen fibers that arches around the lateral rotator cuff, called the crescent area (Fig. 1).[4,10,11,33] It attaches anteriorly on the humerus through the coracohumeral ligament and posteriorly between the insertions of the infraspinatus (IS) and the teres minor (TM) muscles.[4,10,33] Its articular-sided dimensions are an anteroposterior base of 41 mm, inside mediolateral diameter of 14 mm, and width 12 mm (Fig. 1).[4] The RCa is reported to be 2-3 times thicker than the crescent area and is believed to distribute the supraspinatus (SS) and IS contractile force around the crescent area to its 2 humeral attachments, acting like a suspension bridge cable.[3,4,22,26] The RCa's unique shape and dimensions explains why small to medium-size crescent area rotator cuff tears remain asymptomatic and how a partial RCR can improve shoulder function.[2,3,22,26] Further, vertically placed RCR sutures medial as opposed to lateral or within the RCa have greater pullout strength following an RCR.[39]

Yet, the location of the RCa during a bursal-sided arthroscopic RCR is unknown.[14] The RCa can only be seen during repair from the articular side because it is located under the thick longitudinal and crossing fibers of the SS and IS tendons.[1,4,10] As expected, the shape and dimensions of the RCa have only been described and quantified from the articular side after dissecting the rotator cuff capsular complex off its glenoid and humeral insertions.[1,4,10] Disturbing the footprint of the rotator cuff-cable complex could lead to measurement error and an erroneous understanding of the RCa's dimensions.

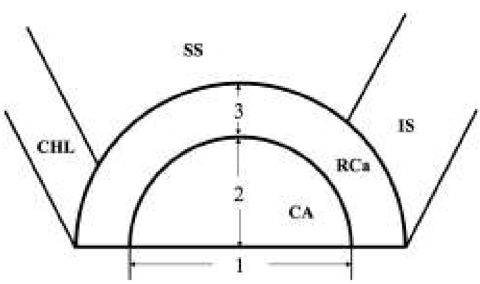

Figure 1 Schematic illustrating the anatomy of the rotator cable (RCa). Notice the RCa arches around the crescent area (CA). The numbers represent the current accepted dimensions of the RCa: number (1) is its humeral anteroposterior base, (2) is its inside mediolateral diameter, and (3) is its width. *CHL*, coracohumeral ligament; *SS*, supraspinatus; *IS*, infraspinatus.

The SS muscle/tendon and posterior half of its myotendinous junction (MTJ) are readily visualized during bursal-sided arthroscopy and aligned perpendicular to each other, thereby creating a dependable reference point that could be used in locating the RCa in the subacromial space.[27,34,38] In clinical practice, the reference point can be simply found at the posterior half of the SS MTJ. [27,34,38]

The purpose of this study was to develop a straightforward reproducible method using the above reference point to locate the RCa during bursal-sided arthroscopic RCRs and compare its bursal- and articular-sided dimensions. Knowing the bursal- and articular-sided location of the RCa in uninjured and injured shoulders could aid in improving our understanding of rotator cuff pathology and improve time zero repair strength. Our hypothesis is that a method can be developed to locate the medial arch of the RCa from the bursal side by using the above reference point and measure its inside and outside anteroposterior base. Further, the RCa's articular- and bursal-sided dimensions will be similar.

Materials and methods

This is a cadaveric study that used a bursal-sided reference point to locate the RCa from the subacromial space and further compares the RCa bursal- and articular-sided dimensions.

Specimens without a medical history or evidence of inflammatory arthritis, fracture, or surgery were included. Twenty cadaveric specimens, scapula to fingertip, with an average age of 75.1 ± 14 (median 77.5, range 32-94) years, met the inclusion criteria. Nine were right arms. The skin and muscles were removed down to the level of the rotator cuff, scapula, and humerus. The humeral shaft was transected at the level of the deltoid insertion. The acromion was osteotomized at its junction with the scapular spine to increase the visualization of the SS muscles. The specimens were divided into 2 groups according to the state of the rotator cuff tendon as intact or full-thickness tear. The tear sizes were measured in the anteroposterior direction.[16]

An inferior capsulectomy was performed between the anterior and posterior inferior glenohumeral ligaments, preserving the subscapularis and the TM muscles and tendons.[28] The humeral head was osteotomized along its anatomic neck from inferior to superior to allow for visualization of the articular side of the rotator cuff tendon (Fig. 2, *A*). The osteotomy was done to preserve the humeral and glenoid attachments of the rotator cuff capsular complex. The bursal and articular surfaces of the rotator cuff and

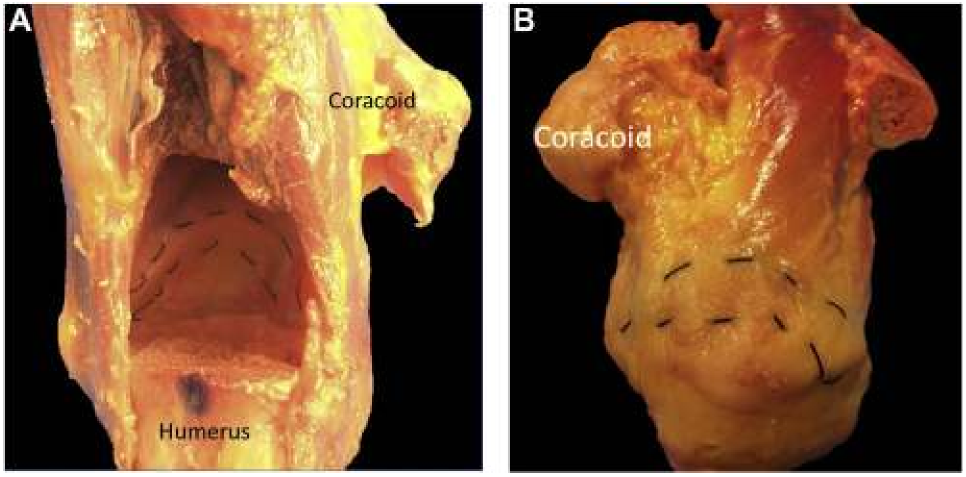

Figure 2 (**A**) Photograph showing the outlined articular-sided RCa. The exposure needed to visualize the RCa was provided by an inferior capsulotomy and humeral osteotomy. The rotator capsular complex remains intact. (**B**) Illustration of the outlined RCa from the bursal side.

capsule were examined for the presence of an RCa. The RCa was considered present when a semilunar band of collagen fibers originating at the CHL and terminating above the TM tendon could be seen with nonmagnified vision or clearly felt as a thickened semilunar structure.[4,10] Once the cable was identified from either the bursal or articular side, the RCa was outlined with a running silk suture on a straight needle along its medial and lateral borders (Fig. 2, *A* and *B*). A straight needle was used to ensure accuracy of the marked border. The shape of the rotator cable was categorized as either arc, U-, or Y-shaped. The humeral osteotomy was anatomically reduced and fixed with bone screws. Heavy no. 2 braded sutures were placed in each of the rotator cuff tendons (SS, IS, and TM) in a Krackow fashion; 2 sutures were placed into the subscapularis upper and lower halves. The sutures were tensioned during the measurements.

Two reference lines were used to locate a bursal-sided reference point that could be replicated during subacromial arthroscopy. The first line ran medial to lateral bisecting the long axis of the SS muscle/tendon, called the SS-bisecting line (Fig. 3, solid white line), and the second line coursed anterior to posterior parallel to the most lateral aspect of the posterior SS MTJ, called the SS MJT line (Fig. 3, dashed white line). The SS MJT line was always located on the posterior half of the SS tendon.[27,34,38] The intersection of these 2 lines were used to create the reference point developed for measuring 4 bursal-sided lengths on the SS-bisecting line: length A was the distance from the reference point to the lateralmost SS insertion; length B was from the reference point to the medial RCa; length C^b was from the medial RCa to the lateral RCa, or the width of the RCa; and length D^b was from the lateral RCa to the lateralmost SS insertion. To account for the curved shape of the humerus, all distances were marked with a string, and the length of the string was measured using a scientific caliper (L.S. Starrett, Athol, MA, USA) with an accuracy of 0.01 mm. For intact rotator cuff tendon specimens, the ratio of length B to length A was calculated. This B-A ratio was determined to account for specimen-size differences.

If both humeral insertions of the RCa remained intact, the bursal-sided anterior-to-posterior base (length E^b) of the rotator cable was measured from the distal medial anterior suture to the distal medial posterior suture (Fig. 4). Length E^b measures the outside anteroposterior humeral base of the RCa.

The rotator cuff capsular complex was sharply removed from the humerus and glenoid for articular-sided measurements (Fig. 5, *A*). The tissue was then secured onto a custom frame and optically scanned using a noncontact measurement system (FaroArm; Faro, Inc., Lake Mary, FL, USA). Three-dimensional solid models were generated from the scans using modeling software (Geomagic; 3D Systems, Rock Hill, SC, USA) (Fig. 5, *B*). Four lengths were measured directly from the rotator cuff capsular complex tissue using a scientific caliper and the same lengths from the 3D constructed models using the above software. The following articular-side lengths were measured: length F, representing the inside anteroposterior RCa's humeral base; length E^a, the outside anteroposterior RCa's humeral base (corresponding to length E^b, which is the bursal-sided outside anteroposterior RCa's humeral base); length D^a, the mediolateral radius of the RCa (corresponding to length D^b, which is the bursal-sided mediolateral radius of the RCa); and length C^a, the width of the RCa (corresponding to length C^b, which is the bursal-sided width of the RCa).

Statistical analysis used an unpaired Student *t* test to compare between the intact rotator cuff and full-thickness rotator cuff tear group. A paired Student *t* test was used to compare bursal- and articular-sided measurements. In order to evaluate whether the length B–length A ratio was predictive for the medial position of the rotator cable, the intact rotator cuff specimens were randomly allocated into 2 equal subgroups, groups 1 and 2, of the intact specimens. The B-A ratio, the ratio values of the 2 groups, were compared with the parametric unpaired *t* test. Statistical significance was set at $P < .05$.

Results

Ten of the 20 specimens had intact rotator cuffs. The other 10 presented with a rotator cuff tear: 1 small (<1 cm), 3 medium (1-3 cm), and 6 large (3-5 cm). The average tear

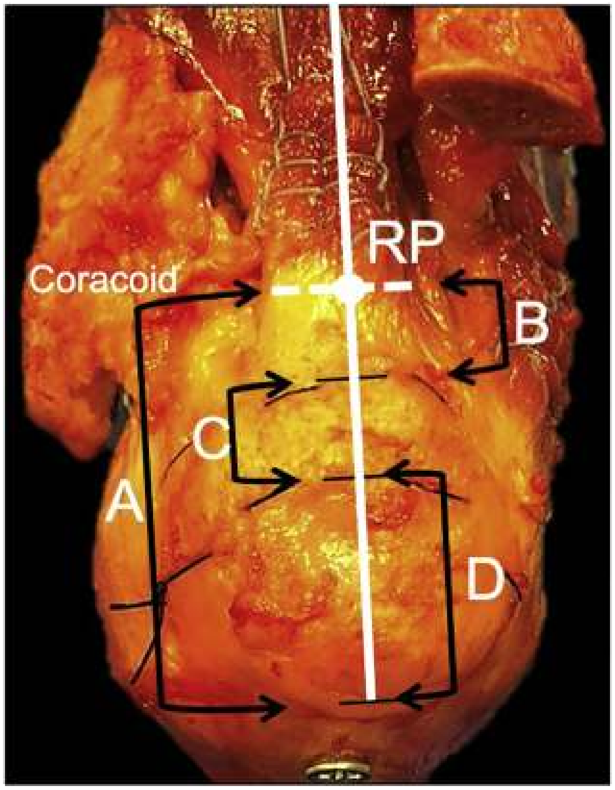

Figure 3 Supraspinatus (SS)–bisecting line (solid white line) and the SS myotendinous junction (MTJ) line (white dashed line) intersecting and forming the reference point (RP) at the posterior SS MTJ. Four bursal-sided lengths were measured on the SS-bisecting line: length A (A) was the distance from the RP to the lateralmost SS insertion, length B (B) was from the RP to the medial rotator cable (RCa), length C^b (C) was the width of the RCa, and length D^b (D) was from the lateral RCa to the lateralmost SS insertion.

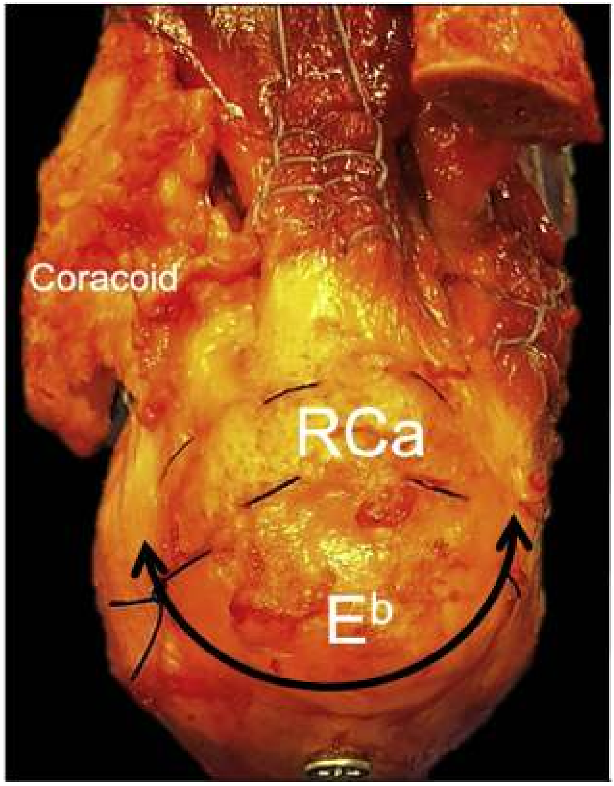

Figure 4 Figure shows length E^b (E), the distance of the outside humeral anteroposterior base of the rotator cable (RCa).

size was 3.0 ± 1.7 cm. The RCa was not visible from the bursal side in any of the specimens; it was visible from the articular side in 19 of the 20 specimens. In the 1 specimen that the RCa was not clearly seen but could be palpated, the RCa was outlined and included in the data analysis. The width of the RCa in the tear group could not be reliably measured, because in 6 of 10 specimens, the rotator cuff tear involved the cable at the SS-bisecting line. For the intact specimens, the shape of the cable was an arch in 9 and a Y in 1.

Bursal-sided RCa measurements

The distance from the reference point to the lateralmost SS insertion (length A) for the intact group measured 34.6 ± 9.3 mm. The mean distance from the reference point to the medial RCa (length B) for the intact group was 9.9 ± 5.6 mm and for the tear group was 4.1 ± 2.4 mm ($P = .007$). The mean width of the RCa (length C^b) was 10.9 ± 2.1 mm, and the distance from the lateral RCa to the lateralmost SS insertion (length D^b) was 13.9 ± 4.8 mm. The raw data are presented in Supplementary Material S1.

The mean ratio of the length of the SS tendon that lies medial to the rotator cable to the whole tendon length (length B–length A ratio) for the intact rotator cuff group was 0.27 ± 0.13. There was no significant difference ($P = .18$) between the B-A ratios for the randomly divided 2 subgroups, indicating that the ratio values of the specimens in group 1 were within the 95% confidence interval of the average ratio value of group 2. The statistical comparison is presented in Supplementary Material S2.

The bursal-sided outer humeral base of the RCa (length E^b) for the intact and tear groups were 46.3 ± 7.1 mm and 51.2 ± 4.2 mm, respectively ($P = .149$). The combined bursal-sided outer humeral base of the RCa (length E^b) was 48.1 ± 6.4 mm.

Articular-sided RCa measurements

Two specimens (nos. 6 and 10) could not be measured from the articular side with the laser micrometer because of poor tissue quality, leaving 8 specimens for analysis. There were no significant differences ($P \geq .169$) between the caliber and laser micrometer for the three 3D measurements, so we elected to report the laser micrometer numbers (Supplementary Material S3). The inside (length F) and

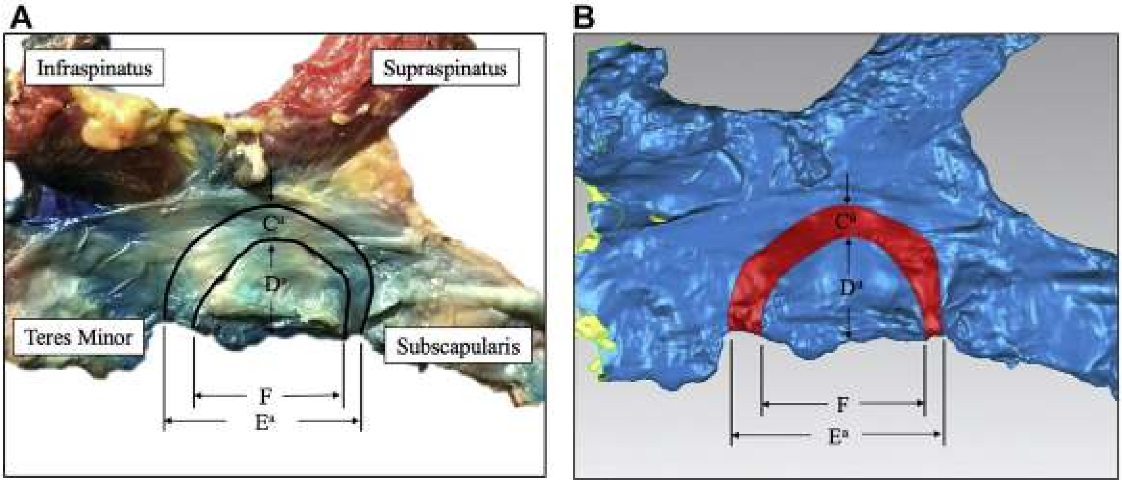

Figure 5 (**A**) rotator cuff capsular complex secured in a custom frame after being released from its humeral and glenoid attachments. The tissue is being viewed from the articular side. The following lengths were made using a scientific caliper: length F (F) inside anteroposterior humeral base of the rotator cable (RCa), length E^a (E^a) outside anteroposterior base of the RCa, length D^a the inside mediolateral radius of the RCa, and length C^a (C^a) the width of the RCa. (**B**) 3D model created from the rotator cuff capsular complex. Using the modeling software, the same above 4 lengths were measured and statistically compared to the caliper measurements.

outside (length E^a) anteroposterior humeral base lengths of the RCa were 37.3 ± 5.9 mm and 49.6 ± 6.5 mm, the inside mediolateral dimension of the crescent (length D^a) 15.4 ± 7.8 mm, and the width of the rotator cable (length C^a) was 7.7 ± 2.9 mm.

Comparison of bursal- and articular-sided measurements

There were no significant differences between the bursal- and articular-sided outside humeral anteroposterior base (P = .268) and mediolateral dimension of the crescent (P = .877); however, the width of the RCa was significantly greater on the bursal side (P = .050). The statistical comparison is found in Supplementary Material S4.

Discussion

The RCa is an important mechanical component of rotator cuff capsular structure but it cannot be visualized from the subacromial space.[4,10,14,22,26,31,39] Currently, the RCa can only be identified from the articular side, which makes recognizing an injury, repairing it, or placing sutures just medial or into it a difficult task.[14] This study provides the surgeon with 2 simple methods, ratio and/or direct measurement, to reliably locate the medial arch of the RCa during bursal-sided arthroscopy. In order to use either method, a bursal-sided reference point is found at the intersection of the SS bisecting line and the SS MTJ line (Figs. 3 and 6). The ratio method uses the finding that the medial arch of the RCa is found on a line that bisects the SS muscle at 27% of its posterior tendon length. A limitation of the ratio method is its accuracy requires an intact rotator cuff. When the 10 intact specimens were randomized into 2 equal groups and statistically compared, the average ratio values in the first group were within the 95% confidence interval of the average ratio values of the second group and vice versa (P = .18), confirming that the length B–length A ratio can be used to reliably located the RCa. The medial arch of the RCa can be located with the aid of an arthroscopic ruler by measuring the distance from the posterior edge of the SS MTJ to its lateral insertion and multiplying by 0.27. The product is the distance from the SS MTJ line to the medial edge of the RCa (Fig. 6).

The second method to locate the medial arch of the RCa is by direct measurement from the reference point. This method can be applied to intact and torn tendons, because it does not depend on the SS tendon length. The medial arch of the RCa on average was located significantly closer to the reference point in the rotator cuff tear group (4.1 ± 2.4 mm) than in the intact group (9.9 ± 5.6 mm) (P = .007). In other words, patients with rotator cuff tears will have their RCa 6 mm closer to the posterior SS MTJ. To our knowledge, this is the first study to quantify the bursal-sided location of the RCa in intact and torn rotator cuff tendons. Despite the lack of literature on its subacromial location, other investigators have also noted medialization of the RCa in rotator cuff tear shoulders.[9,32] During subacromial arthroscopy, the reference point can be readily located by identifying the center of the posterior SS MTJ. The medial RCa arch is positioned on average 10 mm in intact and 4 mm in torn rotator cuff tendons from the posterior SS MTJ (Fig. 6).

There are multiple factors to consider during an RCR, for example, muscle and tendon quality, tendon length, retraction, mobility, type, and repair tension. Another factor

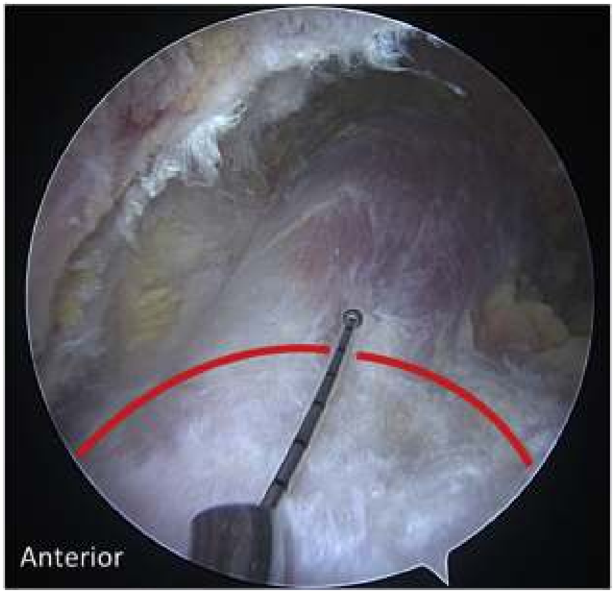

Figure 6 A bursal-sided arthroscopic picture showing that the medial arch of the rotator cable (RCa) starts 10 mm from the posterior supraspinatus (SS) myotendinous junction (MTJ). The RCa can be located using the ratio method by multiplying the distance from the posterior SS MTJ to the lateral SS tendon insertion, 38 mm by 0.27 (38 mm $\times$ 0.27 = 10 mm). The medial arch of the RCa can also be found using the knowledge that it is simply 10 mm from the posterior SS MTJ in intact rotator tendons or 4 mm in small to large full-thickness rotator cuff tears.

to consider is location of the RCa, because its fiber direction is perpendicular to the fiber direction of the SS and IS tendons and it is thicker than the surrounding cuff tissue.[4,10,39] Gerber stated that "the ideal repair should have high initial fixation strength, allow minimal gap formation, and maintain mechanical stability until solid healing."[19] Locating the medial arch of the RCa during subacromial arthroscopy is important to ensuring a mechanically stable repair in retracted tears with tendon loss. Using a single-row repair construct, a mechanical study showed that placing the vertical mattress sutures just medial to the RCa, compared with one lateral to the RCa, results in superior ($P < .01$) suture retention properties.[39] This study's findings suggest that in large to massive rotator cuff tears with tendon loss in the medial-to-lateral direction, vertical mattress sutures should be placed <4 mm from the posterior SS MTJ to decrease the frequency of RCR failure from the tendon pulling through the stitches. However, it is important to avoid tension overload after RCRs, because of the deleterious effects of high tension on rotator cuff integrity and functional outcome.[5,13,20,23,30] In this study, the average distance from the lateral edge of the rotator cuff insertion to the medial edge of the RCa is 25 mm in uninjured tendons (Fig. 3, $D^b + C^b$), and the reported width of the SS footprint is 13 mm.[12,18,27,35] In tears with minimal or no tendon loss, placement of suture medial to the RCa runs the risk of shortening the tendon by 12 mm, which could lead to tension overload.[5] To take advantage of the suture retention properties of the RCa and avoid tension overload, we only recommend placement of vertical mattress sutures <4 mm from the posterior SS MTJ in cases of rotator cuff tears with substantial tendon loss and where the tendon can be easily reduced back to the greater tuberosity. In suture-bridging repairs, the medial row stitches are often placed horizontally instead of vertical.[29] It has been recommended that the medial row sutures should not be placed at MTJ to prevent a type II retear, failure at the MTJ.[6,8,24,25,37] Biomechanical studies have shown that medial-row stitch placement 5-10 mm lateral to the MTJ provides the highest initial fixation strength.[25,37] An anatomic study shows that the RCa is 2-3 times thicker than the crescent area.[4] So the current study results and mechanical literature indicates that positioning the medial-row stitches >10 mm from the posterior SS MTJ places the horizontal sutures within the thicker RCa and thereby helps to prevent a type II retear. Again, obtaining mechanical stability must be balanced with avoiding tension overload during suture-bridging repairs; therefore, placement of horizontal stitches within the RCa should only be done in cases of rotator cuff tears with tendon loss and where the tendon can be easily reduced back to the greater tuberosity.[5,13,20,23,30]

The bursal- and articular-sided outside humeral anteroposterior base of the RCa measured 48.1 $\pm$ 6.4 mm and 49.6 $\pm$ 6.5 mm, respectively, and there were no significant differences between the 2 measurements ($P = .268$). The above finding suggests that a rotator cuff tear involving the SS and IS tendons and measuring >5 cm would rupture both the anterior and posterior insertions of the RCa. The average inside anteroposterior base measurement was 37.3 $\pm$ 5.9 mm. Burkhart et al[4] dissected 20 cadaveric specimens and reported an average inside anteroposterior base measurement of 41.4 mm. Accounting for size variations, the 2 above studies are similar. A clinical SS and IS tendon tear measuring >37 mm but <50 mm would indicate a partial-attachment RCa rupture (Fig. 7). These types of large to massive RTC tears would compromise the RCa's mechanical function as a suspension bridge cable.[4,22,26] The suspension bridge function of the RCa was confirmed by Halder et al[22] in a mechanical study that showed no substantial loss of rotator cuff transmission, with partial SS releases leaving the anterior RCa intact, and in large tears restoring the RCa through side-to-side repairs, leading to the recovery of about 90% of the lost force transmission. Clinically, DeOrio and Cofield[16] investigated secondary RCRs for failed open repairs and defined a massive rotator cuff tear as >5 cm. The authors observed that massive rotator cuff tears obtained a substantial decrease in postoperative active average abduction of 49° compared with 100° for large tears and 118° for medium tears.[13] The poor results noted with massive rotator tear group were attributed to scar tissue, incomplete repair, inadequate acromioplasty, and a compromised deltoid; however, disruption of the RCa insertions could also have

Figure 7 Arthroscopic picture shows a large rotator cuff tear measuring an anteroposterior tear size of 40 mm indicating a partial disruption of the humeral attachment of the RCa.

been a mechanical factor.[4,7,15,22,26] A recent consensus study of American Shoulder and Elbow Surgeons members defined a massive rotator cuff tear "as retraction of tendon(s) to the glenoid rim in either the coronal or axial plane and/or a tear with ≥67% of the greater tuberosity exposed in the sagittal plane."[36] The definition was most likely based on the surgeon's experience in successfully repairing the tear and restoring functional ability. A greater tuberosity exposure of ≥67%, similar to an anterior to posterior tear >5 cm, could also involve disruption of the RCa humeral insertions; however, future anatomic studies need to be completed to fully understand the relationship between the amount of greater tuberosity exposure and the compromise of the RCa attachments.

Given the variety of rotator tear patterns, a limitation of this study is that it could be underpowered to determine the location of the RCa for every tear shape. However, the outside anteroposterior base of the tear and the intact groups was statistically comparable ($P = .149$) and analogous to the published literature.[4] This indicates that the anatomic findings in this study and the literature are similar. The rotator cuff tears in this study were mainly crescent shaped. Another weakness of the present study is the growing body of evidence questioning the importance of the RCa as an anatomic and mechanical structure.[1,14] A recent arthroscopic observational study[14] proposed that the RCa could be a thickening of tissue created through rotator cuff degeneration or tearing and not a true anatomic structure; the authors proposed that the RCa develops with age, based on articular-sided arthroscopic videos showing the RCa present in 80% of the patients aged >40 years and a prevalence of 10% in those aged ≤40 years ($P = .018$). The present study observed the RCa in 19 of 20 specimens; however, the average age was 75 years. Burkhart et al[4] reported an RCa in all 20 cadavers dissected with ages ranging from 60 to 85 years. However, based on their mechanical data and the observation that 2 younger shoulders had thick crescent areas, the authors hypothesized that there are 2 types of rotator cuff capsular complexes—cable dominant (crescent is stress shielded by the cable) and crescent dominant (no stress shielding by the cable).[4] The authors propose the theory that younger adults start with a crescent-dominated rotator cuff that changes with age to become cable dominated.[4] Thus, the RCa's mechanical importance in force transmission may be age dependent. Nonetheless, the RCa acting like a suspension bridge cable is the currently accepted doctrine held by the orthopedic community.[17] Further investigations on the etiology and mechanical importance of the RCa are required to truly understand its ultimate function.

There were no statistical differences between RCa's bursal- and articular-sided dimensions ($P \geq .268$), except that the bursal width (length C^b, 10.9 ± 2.1 mm) of the RCa was greater than the articular width (length C^a, 7.7 ± 2.9 mm, $P = .05$). The larger width from the bursal side most likely is a reflection of the in situ measurement technique. The width measurements are similar to other investigators, which range from 6.1 to 12.4 mm.[1,4,21]

Conclusion

The RCa cannot be seen during bursal-sided arthroscopy; however, its medial arch is located on average 10 mm from the reference point or posterior SS MTJ in intact tendons and 4 mm in small to large rotator cuff tears. Based on the above findings and the mechanical literature, RCR strength for tears with tendon loss can be improved in single-row repairs by positioning vertical mattress stitches <4 mm from the posterior SS MTJ and in suture-bridging techniques by placing the medial row stitches >10 mm from the posterior SS MTJ; this ensures that the horizontal mattress sutures are within the RCa.[25,37,39] However, in rotator cuff tears with minimal to moderate medial-to-lateral tendon loss, placement of stitches medial or in the RCa runs the risk of substantially shortening the SS tendon, which may lead to tension overload.[5] The average inside anteroposterior base of the RCa measures 37 mm. Rotator cuff tears involving or just posterior to the CHL measuring >37 mm are at risk of partially or completely rupturing the RCa's humeral insertions. If these types of rotator cuff injuries are not recognized and appropriately treated, they could negatively impact postoperative function.[2-4,7,15,22,26,31]

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Disclaimers

The authors, their immediate families, and any research foundations with which they are affiliated have not received any financial payments or other benefits from any commercial entity related to the subject of this article.

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