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Improvements in sexual function following arthroscopic rotator cuff repair

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Background: Three-fourths of Americans are sexually active, and studies show a correlation between sexual activity and good health. Rotator cuff tears and subsequent repairs can cause significant disruption in daily living including sexual activity. Orthopedic surgeons rarely discuss sexual activity with patients. Therefore, patients have little information about expectations, restrictions, and return to sexual activity. The primary goal of this study was to evaluate patient improvement in sexual activity following arthroscopic rotator cuff repair and evaluate factors that affect sexual activity.

Methods: An anonymous 20-item multiple-choice survey was sent to patients > 6 months after arthroscopic rotator cuff repair performed by 7 fellowship-trained orthopedic shoulder and elbow surgeons between March 2018 and May 2019. The survey assessed preoperative and postoperative sexual activity and included questions regarding frequency, pain, positioning, and postoperative injury.

Results: A total of 88 patients met the inclusion criteria and completed the survey. Preoperatively, 65% of patients admitted that their shoulder interfered with the quality and/or frequency of their sexual activity, most commonly secondary to an inability to bear weight on the affected arm (31%). Postoperatively, the majority of patients (79%) found it easier to engage in sexual activity, with 35% of patients attributing this to less pain. At 6 weeks postoperatively, 72% of patients returned to sexual activity. The overall trend demonstrated a statistically significant ($P < .001$) increase in sexual activity frequency as one progressed from his or her operative date. It is interesting to note that 31% of patients removed their sling to engage in sexual activity after surgery, with 7% admitting to aggravating their shoulder or causing significant pain.

Conclusion: Prior to arthroscopic rotator cuff repair, most patients experience limitations in the quality and/or frequency of their sexual activity secondary to their shoulder. Following surgery, the majority of patients will more easily engage in sexual activity by 6 weeks, with increasing frequency as time progresses from surgery. Many patients are noncompliant with sling wear during sexual activity, and 7% will aggravate their shoulder.

Level of evidence: Level IV; Case Series; Treatment Study

Keywords: Shoulder; arthroscopic surgery; tendon tear; postoperative sling immobilization; sex; sexual activity; position

Sexual activity is a normal part of life for most individuals, with 75% of Americans stating that they are sexually active.[6] Studies have shown that an active sex life is linked to good health whereas limitations in sexual

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activity can cause unhappiness or tension in relationships.[1,8-13,17] Rotator cuff tears requiring repair can cause significant debilitation in a patient's daily living, especially in his or her sex life.[9] Because sexual activity is such an important component in people's lives, a disruption in activity may significantly affect patient satisfaction after surgery.

Management of preoperative patient expectations presents a major challenge for the orthopedic surgeon. In a study by Hamilton et al,[3] patient preoperative expectations were shown to be 1 of 5 factors directly related to overall patient satisfaction postoperatively. Given the significance of preoperative expectations in patient satisfaction, it is important to offer patients relevant numerical data to provide a reasonable postoperative outlook. One specific aspect of patient satisfaction is return to sexual activity following surgery. The literature reveals that the topic of sex is not often discussed between surgeons and patients. Dahm et al[2] reported that 80% of surgeons rarely or never discussed sexual activity with their patients. Of the surgeons who did discuss sex, 96% spent >5 minutes doing so.

Arthroscopic rotator cuff repair (ARCR) is one of the most commonly performed orthopedic procedures.[16] Despite this, there is a paucity of literature on sexual activity in patients undergoing shoulder procedures such as ARCR. Thus, the primary goal of this study was to evaluate patient improvement in sexual activity after ARCR. We further evaluated specific preoperative and postoperative factors related to sexual activity including sexual position and length of time to return to sexual activity. We hypothesized that patients undergoing ARCR would have significant improvement in sexual activity after their surgical procedures.

Materials and methods

This was a single-center retrospective study of patients undergoing ARCR performed by 7 fellowship-trained orthopedic shoulder and elbow surgeons between March 2018 and May 2019. An electronic query was performed to identify patients who had undergone ARCR 6 months earlier. The query was obtained using Current Procedural Terminology code 29827 (under "Endoscopy/Arthroscopy Procedures on the Musculoskeletal System") and an associated *International Classification of Diseases, Tenth Revision* code indicating a diagnosed rotator cuff tear, which was ipsilateral and was treated within a reasonable date of surgery. This query was performed on a monthly basis to establish our patient cohort.

A survey was developed to anonymously analyze preoperative and postoperative sexual activity and function. This was adapted from that in a similar study by Kazarian et al,[7] who assessed sexual activity before and after total knee arthroplasty (TKA). The survey questions were specifically tailored to the shoulder, and all questions were multiple choice to allow for standardization of data and effective statistical analysis. The final survey consisted of 20 multiple-choice questions (Supplementary Appendix S1). A few questions allowed selection of >1 answer choice; therefore, some of the reported results have disparate proportions. All surveys were sent to each monthly cohort via e-mail using REDCap, a Health Insurance Portability and Accountability Act–compliant and secure Web platform for building and managing online databases and surveys.[4,5] Patients were excluded if they asked to be removed from the study, failed to provide a complete questionnaire response, or denied being sexually active preoperatively.

Statistical analysis was performed with the help of our institution's biostatistician. Software used included RStudio (version 3.5.1; Vienna, Austria) and Microsoft Excel (Microsoft, Redmond, WA, USA). Descriptive statistics of the data were used to analyze the breakdown of the study and to provide proportions and percentages. Questions on the frequency of sexual activity at various postoperative time intervals underwent proportions testing to assess the differences compared with preoperative sexual activity frequency. If a significant P value was found, multiple comparisons testing was used. If a P value was found to be, $P < .05$, it was considered to be statistically significant.

Results

Study response

The study questionnaire was distributed to 555 patients who fit the eligibility criteria. Of these patients, 119 responded whereas the remaining 436 did not respond or declined to participate in the study. Twenty-three percent of patients who responded to the questionnaire (27 of 119) did not engage in sexual activity prior to ARCR and were therefore excluded. Of the 119 patients who responded, 4 did not complete the survey in its entirety and were thus excluded. The remaining 88 patients were sexually active prior to ARCR and agreed to participate in the study by fully completing the questionnaire.

Impact on sexual activity prior to ARCR

Among the patients who engaged in sexual activity prior to ARCR, 65% (57 of 88) admitted that their shoulder interfered with the quality and/or frequency of their sexual activity. The length of time a patient's shoulder affected his or her sexual activity prior to surgery varied among the patients: 25% (18 of 72) were affected for <1 month; 28% (20 of 72), between 1 and 3 months; 24% (17 of 72), >3 months but <6 months; 14% (10 of 72), >6 months but <1 year; and 10% (7 of 72), >1 year. Factors most commonly impacting sexual activity were change in commonly used positions (20% [35 of 176]), pain (23% [40 of 176]), diminished motion (26% [46 of 176]), and inability to place weight on the affected arm (31% [55 of 176]). Table I details the positions patients avoided, as well as the positions patients comfortably engaged in prior to undergoing ARCR.

Table I Comparison of preoperative sexual positions avoided and comfortably engaged in by patients vs. postoperative sexual positions comfortably engaged in by patients

	Preoperatively, what sexual positions did you have to avoid?	Preoperatively, what sexual positions could you comfortably engage in?	Postoperatively, what sexual positions could you comfortably engage in?
Being below partner	5% (8 of 157)	40% (68 of 168)	25% (37 of 146)
Lying on side	22% (35 of 157)	19% (32 of 168)	NA
Lying on nonoperative side	NA	NA	17% (25 of 146)
Being on top of partner	28% (44 of 157)	14% (23 of 168)	9% (13 of 146)
Bearing weight on affected arm	43% (68 of 157)	2% (4 of 168)	NA
Avoiding weight bearing on affected arm	NA	NA	34% (50 of 146)
Standing	1% (2 of 157)	24% (41 of 168)	10% (14 of 146)
Other	NA	NA	5% (7 of 146)

NA, not applicable.

Improvement in sexual activity following ARCR

The majority of patients demonstrated an overall improvement in sexual activity 6 months following ARCR. Of the patients, 79% (68 of 86) said it was easier to engage in sexual activity, 2% (2 of 86) said it was more difficult, 17% (15 of 86) said it was no different, and 1% (1 of 86) said they did not engage in sexual activity (Fig. 1). Within the cohort of patients who expressed that it was easier to engage in sexual activity after ARCR, 35% (62 of 179) said it was because of less pain; 34% (60 of 179), because of better mobility; 30% (53 of 179), because they felt more comfortable that they would not hurt their shoulder or damage the repair, and 2% (4 of 179), for other reasons.

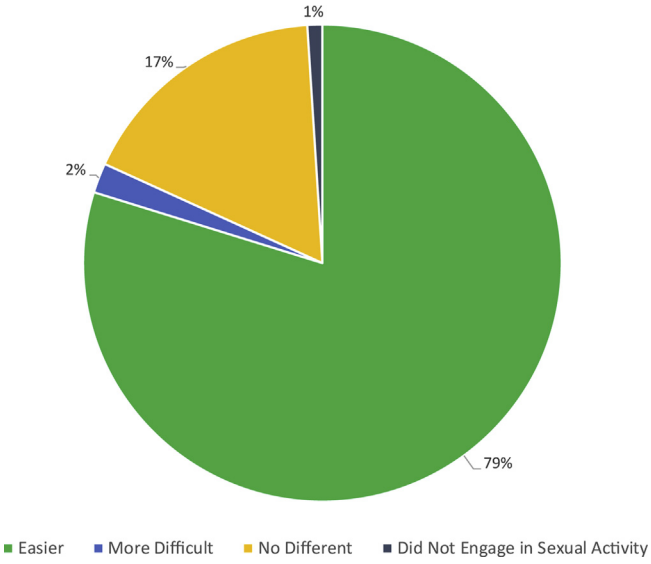

Figure 1 Assessment of ability to engage in sexual activity 6 months after arthroscopic rotator cuff repair *(ARCR)* compared with preoperative status.

Time to return to sexual activity

Even though the majority of patients showed an overall improvement in sexual activity after ARCR, the time at which patients resumed sexual activity varied. Of the patients, 11% (10 of 88) waited to resume sexual activity for <1 week, 24% (21 of 88) waited >1 week but <3 weeks, 36% (32 of 88) waited >3 weeks but <6 weeks, and 28% (25 of 88) waited >6 weeks (Fig. 2).

Additionally, the frequency of sexual activity postoperatively compared with that preoperatively varied throughout different postoperative time intervals (Table II). However, the overall trend demonstrated a statistically significant ($P < .001$) increase in sexual activity frequency as one progressed from his or her operative date.

Impact on sexual activity following ARCR

Despite the overall trend of improved sexual activity following ARCR, 11% of patients (10 of 88) still remained cautious during the acute postoperative period, and patients acknowledged discontinuing sexual activity secondary to limited motion of the shoulder (35% [21 of 60]), shoulder pain (30% [18 of 60]), fear of damaging the repair (27% [16 of 60]), and reasons unrelated to the shoulder (8% [5 of 60]). Furthermore, 73% of patients (64 of 88) changed their sexual position in the acute postoperative period to accommodate their shoulder. Table I details the sexual positions patients preferred after ARCR.

It is interesting to note that 31% of patients (27 of 87) removed their sling to engage in sexual activity after their operation. Additionally, 7% of patients (6 of 88) admitted to aggravating their shoulder or causing significant pain to their shoulder while engaging in sexual activity after ARCR.

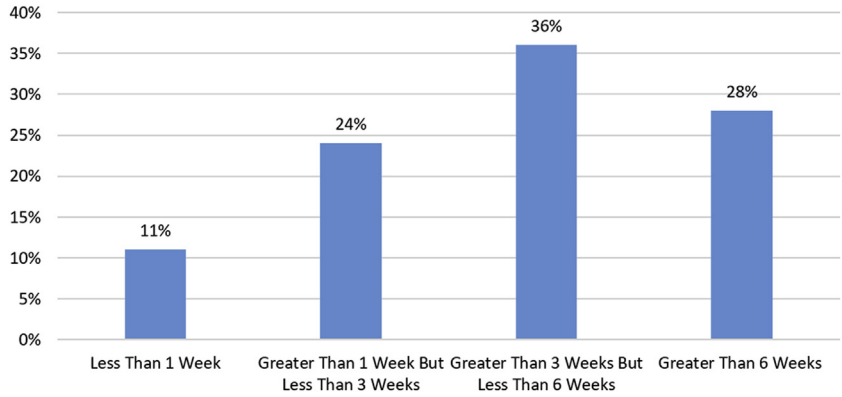

Figure 2 Duration of time patients waited to resume sexual activity after arthroscopic rotator cuff repair *(ARCR)*.

Table II Frequency of sexual activity at various postoperative time intervals Multiple comparison testing was conducted to assess sexual activity frequency (less, same, more, did not engage in sexual activity) over different time intervals (6 weeks, 6 weeks to 3 months, 3 months to 6 months, 6 months) to yield an overall p-value

	Less	Same	More	Did not engage in sexual activity
1. Amount of sexual activity in first 6 wk	30 of 88 (34%)	28 of 88 (32%)	4 of 88 (5%)	26 of 88 (30%)
2. Amount of sexual activity from 6 wk to 3 mo	20 of 88 (23%)	51 of 88 (58%)	13 of 88 (15%)	4 of 88 (5%)
3. Amount of sexual activity from 3 mo to 6 mo	11 of 88 (13%)	55 of 88 (63%)	21 of 88 (24%)	1 of 88 (1%)
4. Amount of sexual activity at 6 mo from surgery	7 of 88 (8%)	57 of 88 (65%)	24 of 88 (27%)	0 of 88 (0%)
P value	<.001	<.001	<.001	<.001
Intervals showing greatest differences on multiple comparisons testing	1 vs. 3 and 1 vs. 4	1 vs. 2, 1 vs. 3, and 1 vs. 4	1 vs. 3 and 1 vs. 4	1 vs. 2, 1 vs. 3, and 1 vs. 4

Multiple comparisons testing was conducted to assess sexual activity frequency (less, same, more, or did not engage in sexual activity) over different time intervals (6 weeks, 6 weeks to 3 months, 3 months to 6 months, or 6 months) to yield an overall *P* value.

Discussion

The most important findings of this study were that the majority of preoperative patients with symptomatic rotator cuff tears requiring surgery (65%) reported their shoulder interfered with the quality and/or frequency of their sexual activity, with 79% of them reporting it was easier to engage in sexual activity after ARCR. Furthermore, 31% of patients removed their required postoperative sling to engage in sexual activity, and 7% of admitted to aggravating their shoulder during sex as a result. To our knowledge, this is the first study to evaluate sexual function following ARCR.

Our study found that 23% of patients (27 of 119) were not engaging in sexual activity prior to ARCR. This percentage mirrors that found by the General Social Survey, which reported that roughly 25% of Americans are not sexually active.[6] Of the patients in our study who were sexually active, 65% reported difficulty with sexual function preoperatively. Most commonly, these patients attributed their difficulty to placing weight on the affected arm (31%). The majority of patients reported that their shoulder affected their sexual activity for <6 months prior to undergoing surgery. This finding differs significantly from the total joint arthroplasty literature, in which Kazarian et al[7] found that patients experience limitations in sexual activity for an average of 17.1 months prior to TKA. Furthermore, in our cohort, patients adjusted their sexual positions preoperatively to accommodate their shoulder, with 43% avoiding positions of bearing weight on the affected arm and 40% comfortably engaging in sexual activity by being below their partner. These findings mirror those of Kazarian

et al, who demonstrated that 79% of patients avoided kneeling or placing weight on their affected knee whereas 76% of patients favored positions that allowed them to lie on their back below their partner. Thus, patients should be encouraged to avoid any position that places weight on the affected extremity and to consider non–weight-bearing positioning such as being below their partner.

Improvement in sexual activity following ARCR was noted in 79% of patients, most commonly attributed to reduced pain (35%). When we assessed how long patients waited to resume sexual activity, approximately 72% resumed sexual activity by 6 weeks. Despite the fact that 30% of patients did not engage in sexual activity for the first 6 weeks following surgery, 100% of patients returned to sexual activity 6 months after surgery, with 27% reporting increased frequency compared with the preoperative period. Similarly, Nunley et al[14] showed that 25% of patients undergoing TKA experienced an increase in sexual activity postoperatively. Despite the overall improvement in sexual activity, 8% of patients did admit to a decreased sexual frequency at 6 months postoperatively compared with their preoperative status. In the study by Kazarian et al,[7] a comparable number of TKA patients (7%) experienced a decreased frequency in sexual activity following their procedure.

Comparison testing revealed that the number of patients having less sexual activity postoperatively vs. preoperatively significantly decreased over time, showing that patients are returning to sexual activity following surgery. Further comparison testing indicated that the number of patients having more sexual activity postoperatively vs. preoperatively significantly increased over time, supporting the notion that patient sexual function is improving with a greater time from surgery. In addition, the number of patients not engaging in sexual activity postoperatively vs. preoperatively significantly decreased over time, signifying that patients feel more comfortable engaging in sexual activity as time progresses from their surgery date.

Despite the general improvement seen in sexual activity postoperatively, there were several findings to suggest surgery may not improve patient sexual function dramatically. Our study showed that at 6 months, 65% of patients were engaging in the same amount of sexual activity as they were preoperatively. Nevertheless, this finding may have been attributed to non–shoulder-related factors such as personal or marital concerns. In addition, 74% of patients changed their sexual positions preoperatively and a similar percentage of patients (73%) changed their positions postoperatively to accommodate their shoulder. Therefore, patients stayed consistent with the changing of positions both preoperatively and postoperatively. One reason for this result may be that patients were careful to protect their surgical repair.[9] This is supported by the fact that 27% of patients who discontinued sexual activity did so out of fear of damaging their repair. In addition, 34% of patients avoided bearing weight on their operative arm when engaging in sexual activity postoperatively.

During the postoperative period, it is of utmost importance for patients to remain compliant with the postoperative protocol to avoid damaging the repair. Patient noncompliance is a known obstacle in rotator cuff surgery, with Silverio and Cheung[15] reporting 88% non-adherence to postoperative restrictions following rotator cuff repair. Our finding that almost one-third of patients are not following the postoperative sling protocol brings up the concern of whether patients are being counseled appropriately. It is known that up to 80% of surgeons rarely or never discuss sexual activity with their patients[2]; perhaps, better patient education and counseling on appropriate weight bearing, sling immobilization, and safe sexual practices could help avoid further pain or injuries, as were reported in 7% of our patients. Further studies may want to examine the relationship between preoperative education and postoperative patient compliance with physician recommendations.

Our study was limited by the following factors: First, to guarantee that our patients remained anonymous, no medical history or demographic data were obtained from them. Given this fact, we cannot say with certainty that our cohort of patients is truly representative of the population of patients undergoing ARCR. Second, surveys were sent to patients 6 months postoperatively, requiring patients to recall their sexual activity at all points prior to that time. As a result, there is the possibility of recall bias. Third, our response rate was 21% (119 of 555), which may limit the generalizability of our study regarding the sexual activity of patients undergoing rotator cuff repair. Finally, our study was limited to 6-month follow-up. Given that patients typically return to activities of daily living at 14 months following rotator cuff repair, it is possible that even further improvements may be seen in these patients.[1] Future studies may want to extend the length of follow-up to determine whether additional improvements in sexual function are obtained at >6 months postoperatively.

Conclusion

Prior to ARCR, most patients experience limitations in the quality and/or frequency of their sexual activity secondary to their shoulder. Following surgery, the majority of patients will more easily engage in sexual activity by 6 weeks, with increasing frequency as time progresses from surgery. Many patients are noncompliant with sling wear during sexual activity, and 7% will aggravate their shoulder.

Disclaimer

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Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jse.2020.06.017.

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