Impact of Patient Resilience on Functional Outcomes after Rotator Cuff Repair

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Disclosures

I (and/or my coauthors) have no relevant disclosures for this study. All other disclosures can be found on the AAOS disclosure website.

Introduction

Ⓡ Mental and emotional health can affect orthopaedic surgery outcomes, with patient resilience being a potentially impactful factor in optimizing recovery.

Ⓡ Since scales to measure patient resilience were introduced, studies have begun to examine the relationship between resilience scores and functional outcomes following orthopaedic surgery.

The Brief Resilience Scale (BRS)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BRS 1 I tend to bounce back quickly after hard times:	☐	☐	☐	☐	☐
	1	2	3	4	5
BRS 2 I have a hard time making it through stressful events:	☐	☐	☐	☐	☐
	5	4	3	2	1
BRS 3 It does not take me long to recover from a stressful event:	☐	☐	☐	☐	☐
	1	2	3	4	5
BRS 4 It is hard for me to snap back when something bad happens:	☐	☐	☐	☐	☐
	5	4	3	2	1
BRS 5 I usually come through difficult times with little trouble:	☐	☐	☐	☐	☐
	1	2	3	4	5
BRS 6 I tend to take a long time to get over setbacks in my life:	☐	☐	☐	☐	☐
	5	4	3	2	1

Introduction

- In knee arthroscopy patients, only those with higher pre-operative BRS resilience scores saw significant improvement from preoperative to 6-month postoperative IKDC or KOOS outcomes scores.

- In rotator cuff repair (RCR) patients, pre-operative resilience has no correlation to reaching a predetermined ASES substantial clinical benefit threshold at 6-months or 1-year follow-up.

Purpose

To evaluate the relationship between pre-operative patient resilience and 2-year post-operative functional outcomes in RCR patients, with a secondary purpose of evaluating whether resilience is static or changes over time.

Methods – Inclusion/Exclusion

Study design: retrospective cohort study

Inclusion/Exclusion Criteria:

- **Inclusion**:
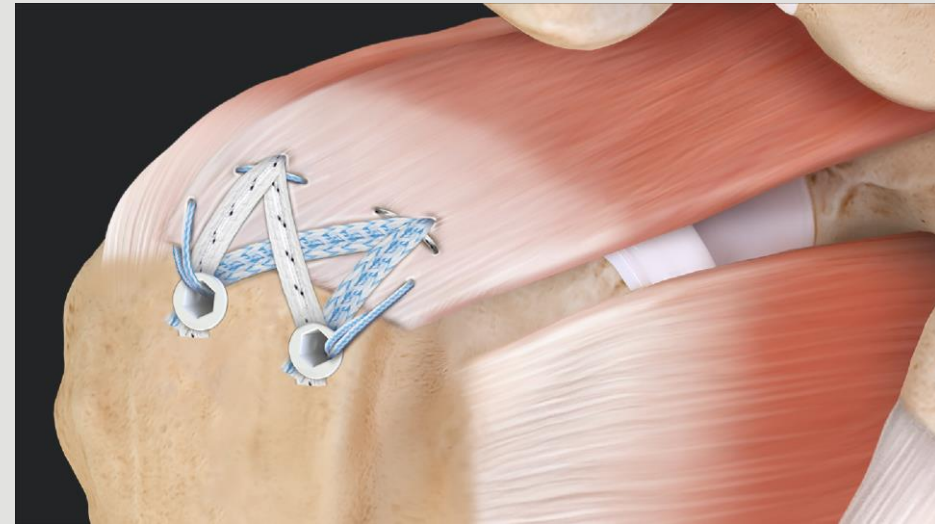- Patients who underwent primary arthroscopic RCR (CPT code 29827) from January-August 2020
  - Completed the Brief Resilience Scale (BRS) pre-operatively through standard-of-care
  - Minimum 2-year follow-up
- **Exclusion:**
  - Revision RCR
  - Subscapularis repair

Data Collection

- **Retrospective chart review**:
  - Outcomes Based Electronic Research Database (OBERD) was screened to identity primary RCR patients who pre-operatively completed the BRS
  - Chart review was then performed to collect:
    - pre-operative sports participation
    - mental health conditions
    - rotator cuff tear size
    - concomitant procedures.

- **Post-operative outcomes of interest**:
  - Reoperations
  - ASES
  - SANE
  - BRS

Statistical Analysis

- Patients were assigned to one of three groups:
    - Low resilience: BRS scores >1 standard deviation below the mean
    - Normal resilience: BRS scores within one standard deviation of the mean
    - High resilience: BRS scores >1 standard deviation above the mean

- Multivariate regression was performed with ASES score improvement as the outcome of interest and pre-op BRS score, age, sex, sport participation, mental health status, and tear size as independent variables.

Results - Demographics

100 RCR patients included (low resilience: n=17, normal resilience=n=64, high resilience: n=19)
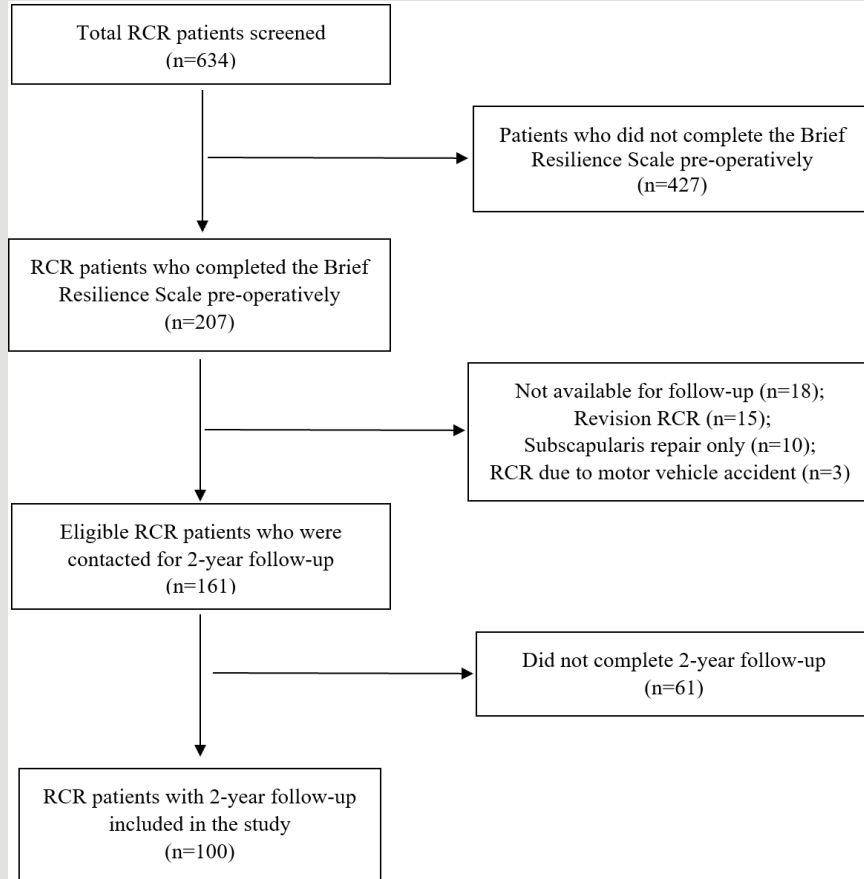
Variable	Low Resilience (n=17)	Normal Resilience (n=64)	High Resilience (n=19)	P Value
Age (years)	61.1 (7.7)	59.4 (9.8)	60.1 (8.3)	0.777
Male Sex	7 (41.2%)	33 (51.6%)	12 (63.2%)	0.417
BMI	30.0 (6.0)	29.3 (5.2)	27.9 (3.3)	0.742
Surgery on Dominant Side	10 (58.8%)	37 (57.8%)	12 (63.2%)	0.917
Pre-Op Sport Participation	1 (5.9%)	21 (32.8%)	4 (21.1%)	0.062
Mental Health Condition:				**0.001**
None	10 (58.8%)	60 (93.8%)	17 (89.5%)	
Depression	3 (17.6%)	0 (0.0%)	1 (5.26%)	
Anxiety	2 (11.8%)	4 (6.25%)	1 (5.26%)	
Depression and Anxiety	2 (11.8%)	0 (0.0%)	0 (0.0%)	
Tear Size:				0.691
Small to Medium	2 (11.8%)	15 (23.4%)	3 (15.8%)	
Large	10 (58.8%)	38 (59.4%)	13 (68.4%)	
Massive	5 (29.4%)	11 (17.2%)	3 (15.8%)	
Subscapular tear	3 (17.6%)	19 (29.7%)	7 (36.8%)	0.456
Concomitant biceps tenodesis	5 (29.4%)	28 (43.8%)	9 (47.4%)	0.494
Concomitant subacromial decompression	9 (52.9%)	36 (56.2%)	12 (63.2%)	0.809
Pre-Operative ASES Score	35.0 (19.1)	42.1 (18.4)	53.6 (20.2)	**0.022**

Changes in Resilience Over Time

Variable	Low Resilience (n=17)	Normal Resilience (n=64)	High Resilience (n=19)	P Value
Pre-Op Resilience	2.8 (0.3)	3.7 (0.4)	4.8 (0.2)	**<0.001**
6 Month Resilience Group:				**0.007**
Low Resilience (n=7)	5 (55.6%)	2 (10.0%)	0 (0.0%)	
Normal Resilience (n=21)	4 (44.4%)	13 (65.0%)	4 (44.4%)	
High Resilience (n=10)	0 (0.0%)	5 (25.0%)	5 (55.6%)	
2 Year Resilience Group:				**<0.001**
Low Resilience	8 (47.1%)	7 (10.9%)	0 (0.0%)	
Normal Resilience	8 (47.1%)	45 (70.3%)	10 (52.6%)	
High Resilience	1 (5.9%)	12 (18.8%)	9 (47.4%)	

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Post-Operative Outcomes

Variable	Low Resilience (n=17)	Normal Resilience (n=64)	High Resilience (n=19)	P Value
Revision	1 (5.9%)	3 (4.7%)	1 (5.3%)	1.000
Non-Revision Reoperation	1 (5.9%)	2 (3.1%)	0 (0.0%)	0.505
ASES Score	82.1 (20.3)	87.6 (16.8)	92.6 (9.3)	0.164
ASES Score Improvement	47.0 (23.9)	45.0 (23.3)	38.2 (20.5)	0.406
Meets ASES MCID	16 (94.1%)	51 (87.9%)	11 (73.3%)	0.229
Meets ASES SCB	15 (88.2%)	50 (86.2%)	11 (73.3%)	0.400
Meets ASES PASS	11 (64.7%)	53 (82.8%)	17 (89.5%)	0.168
SANE Score	79.9 (23.4)	86.1 (15.3)	92.4 (7.3)	0.093
Meets SANE PASS	15 (88.2%)	56 (87.5%)	19 (100%)	0.339

Multivariate Analysis:
Relationships with ASES Score Improvement

Variable	Estimate	P Value	Lower 95% CI	Upper 95% CI
<u>Pre-Op Resilience</u>	-5.64	0.150	-13.26	1.97
<u>Age</u>	0.18	0.528	-0.38	0.74
<u>Sex</u>	4.50	0.405	-6.03	15.02
<u>Pre-Op Sport Participation</u>	-1.32	0.827	-13.16	10.51
<u>Mental Health:</u>				
None	Reference			
Depression	-5.76	0.638	-29.68	18.15
Anxiety	-4.08	0.669	-22.68	14.52
Both	-18.49	0.290	-52.48	15.50
<u>Tear Size:</u>				
Small/Medium	Reference			
Large	-14.13	**0.035**	-27.07	-1.22
Massive	-8.52	0.305	-24.71	7.66

Conclusion

Functional outcomes at 2-year follow-up did not differ based on pre-operative patient resilience for arthroscopic RCR patients. Multivariate analysis also showed that preoperative resilience did not correlate with ASES score improvement following RCR, however, resilience at 2-year follow-up instead correlated with ASES score improvement.