

Risk Factors for Early Failure of Non-operative Management of Rotator Cuff Tears

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DISCLOSURE(S) OF INTEREST

I (and/or my co-authors) have no financial interests to disclose
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Background

- Degenerative rotator cuff tears (RCTs) are common²
- Management typically includes a trial of non-operative treatment
 - Physical Therapy
 - +/- Corticosteroid injection
- Surgery may be indicated after failure of non-operative treatment
- Limited data regarding which patients are likely to fail non-operative management^{1-4,6}



Scope of Study

Objective: To identify risk factors associated with early failure of non-operative management of atraumatic, degenerative RCTs

Hypothesis: Increased age, number of comorbidities and poor function of the affected arm will lead to increased early failure

Methods- Study Design

Retrospective cohort included patients > 18y with MRI-confirmed degenerative RCTs who underwent Rotator Cuff repair between 2012-2018 by two fellowship-trained shoulder surgeons

Patients were separated into 2 groups based on time from initial presentation to surgery:

- Early surgery: ≤ 3 months
- Delayed surgery: > 3 months

Methods- Study Design Cont.

Inclusion criteria:

- MRI confirmed Rotator Cuff Tear
- Atraumatic etiology
- >1 year of post-operative follow-up

Exclusion Criteria:

- Traumatic etiology
- <1 year of follow-up

Cohort Composition

Early surgery (≤ 3 months): 107 patients

Late surgery (> 3 months): 37 patients

Multiple variables were analyzed including demographic, clinical, radiographic, anatomic and patient-reported risk factors

Demographic Risk Factors

Older age, shorter length of symptoms from initial onset to presentation and no current tobacco use were associated with early surgery

No statistical difference in number or type of comorbidities

	≤3 months from 1 st visit to surgery			>3 months from 1 st visit to surgery			p-value
	(N=107)			(N=37)			
	N	%		N	%		
Gender							0.58
Female	61	57		23	62		
Male	46	43		14	38		
Dominant arm							0.31
Missing	3	3		4	11		
No	40	37		16	43		
Yes	64	60		17	46		
Duration of Symptoms							0.05*
Missing	1	1		0	0		
≤3	39	36		5	14		
4-10	27	25		11	30		
11-25	28	26		16	43		
>25	12	11		5	14		
Tobacco use							0.04*
Missing	1	1		0	0		
No	96	90		28	76		
Yes	10	9		9	24		
Opioid use							0.38
Missing	3	3		1	3		
No	93	87		30	81		
Yes	11	10		6	16		
Corticosteroid injection							0.09
No	66	62		15	41		
Yes	41	38		22	59		
	N	Mean	Std	N	Mean	Std	p-value
Age at surgery	106	61	11	37	56	9	0.02*
BMI	107	30	7	37	31	8	0.41

Clinical Risk Factors

ER strength <5/5 and presence of night pain associated with early surgery

	≤3 months 1 st visit to surgery			>3 months 1 st visit to surgery			p-value
	N	Mean	Std	N	Mean	Std	
ROM ER	106	49.8	14.4	37	49.6	12.4	0.93
ROM FF	106	149.8	31.5	37	155.9	25.8	0.29
ER Strength	49	46%		24/36	67%		0.03*
IR Strength	59/70	84%		19/21	90%		0.72
Supra. Strength	29	27%		14/36	39%		0.18
Night pain	89/94	95%		27/34	79%		0.02*
Biceps groove pain	82/100	82%		24/32	75%		0.39
Jobe sign	62/81	77%		22/26	85%		0.38
Lag sign	7/91	8%		2/33	6%		1
Hornblower's	0/90	0%		0/27	0%		NA

Radiographic and PROs Risk Factors

No significant difference between pre-operative patient-reported outcomes, radiographic tear characteristics or shoulder anatomy

	≤3 months 1 st visit to surgery			>3 months 1 st visit to surgery			p-value
	N	Mean	Std	N	Mean	Std	
VAS Pain	100	7.2	2.2	36	6.9	2.1	0.43
SSV	89	53	22.6	28	53	25	0.99
ASES	8	52.2	22.8	3	47.1	17.8	0.92
Brophy	8	5.8	3.8	3	5	3.6	1

Discussion

Risk factors associated with early surgery:

- Shorter time from symptom onset to presentation (< ~10mos vs > ~10 mos)
- Older age (61 +/- 11y vs 56 +/- 9y)
- Presence of night pain
- External strength < 5/5

Our study agrees with previous studies which show that poor radiographic signs (e.g. high-grade fatty atrophy) and anatomic features (e.g. tear size) are not associated with failure of non-operative treatment^{2,3}

Conclusion

This study demonstrated that older age, decreased external rotation strength, presence of night pain and shorter duration of symptoms prior to presentation are associated with early surgery in patients with MRI proven rotator cuff tears

This information can help clinicians plan treatment and educate patients with rotator cuff tears in regards to their prognosis with or without surgery

References

1. Boorman, R. S., More, K. D., Hollinshead, R. M., Wiley, J. P., Brett, K., Mohtadi, N. G., . . . Bryant, D. (2014). The rotator cuff quality-of-life index predicts the outcome of nonoperative treatment of patients with a chronic rotator cuff tear. *J Bone Joint Surg Am*, 96(22), 1883-1888
2. Dunn, W. R., Kuhn, J. E., Sanders, R., An, Q., Baumgarten, K. M., Bishop, J. Y., . . . Group, M. S. (2016). 2013 Neer Award: predictors of failure of nonoperative treatment of chronic, symptomatic, full-thickness rotator cuff tears. *J Shoulder Elbow Surg*, 25(8), 1303-1311.
3. Meissner-Haecker, A., Contreras, J., Valenzuela, A., Delgado, B., Taglioni, A., De Marinis, R., . . . Liendo, R. (2022). Critical shoulder angle and failure of conservative treatment in patients with atraumatic full thickness rotator cuff tears. *BMC Musculoskelet Disord*, 23(1), 561
4. Nakhaei Amroodi, M., & Salariyeh, M. (2020). Predictors of failure after conservative treatment of symptomatic partial-thickness rotator cuff tear. *J Shoulder Elbow Surg*, 29(1), 113-120
5. Tashjian, R. Z. (2012). Epidemiology, natural history, and indications for treatment of rotator cuff tears. *Clin Sports Med*, 31(4), 589-604.
6. Weekes, D. G., Campbell, R. E., Allegretto, J. R., Lopez, S. G., Pepe, M. D., Tucker, B. S., . . . Tjoumakaris, F. P. (2020). A Prospective Study of Patient Factors and Decision-making for Surgical Repair of Symptomatic Full-Thickness Rotator Cuff Tears. *Orthopedics*, 43(2), 85-90.

Thank You!

