Delayed Arthroscopic Repair In Massive Traumatic Rotator Cuff Tears: Is It Worth Repairing?

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INTRODUCTION:

The treatment of choice in traumatic mRCTs is early surgical repair. Late diagnosis leads to tendon retraction and muscle fatty infiltration. In these cases, there is controversy over whether tendon repair is indicated due to high risk of failure. The aim of this study was to analyze clinical outcomes of delayed arthroscopic repair of traumatic massive rotator cuff tears (mRCTs) and to measure structural healing of the cuff on magnetic resonance imaging(MRI).

METHODS:

Retrospective study between 2021-2023 of patients with traumatic mRCTs of >3 months duration treated by arthroscopic repair. Degenerative tears, single tendon tears, associated fractures, and <1 year follow-up were excluded. In total 13 patients, average age 62.6 years (45-75 years), 61.5% men and 53.8% active workers. Mean time to diagnosis was 4.7 months (2-8 months) and mean time to surgery was 8.2 months (3-12 months). 61.5% had C3 supraspinatus-infraspinatus tear and 38.5% had C3 supraspinatus-infraspinatus and upper third of subscapularis tear. 15.4% had grade-1 fatty infiltration according to the Goutallier classification, 61.5% grade-2 and 23.1% grade-3. PLB tenotomy and double row repair were performed. Pain, mobility, satisfaction and Constant Score (CS) were analyzed. MRI was performed 6 months postoperatively to evaluate tendon healing. The average follow-up was 15.5 months (12-25 months).

RESULTS:

At the end of follow-up, 92.3% were satisfied with the surgery and only one patient presented unsatisfactory results. Mobility improved 25o of elevation (126o to 151o, p=0.027), 28o of ER1 (20.7o to 48.7o, p=0.012), pain by 4.5 points (from 6.1 to 1.6, p<0.001) and CS by 32.8 points (38.2 to 71, p<0.001). Patients with CS <70 (n=4) had a higher degree of preoperative grade-3 fatty infiltration in the infraspinatus (75% vs 0%, p=0.024). A total of 61.5% presented retear in the control MRI. Fatty infiltration increased at least 1 grade in 69%: 20% of patient without retear and in all patients with retears. The risk of retear increases by 10 when patients undergo surgery 6 months after the trauma [OR =10.5; CI(0.67; 165.1); p=0.217]). Pain relief improved regardless of whether there is a retear (2.4 vs 0.8,p=0.249)

DISCUSSION AND CONCLUSION:

Delay repair of massive traumatic RCTs is a valid surgical treatment that improves pain and functional outcomes. However, despite good clinical results, 61.5% of the patients presented a retear. Data in the literature concerning retear rates after traumatic RCT repairs range between 10% a 25%. We believe that the high rate of retear observed in our study may be due to the time between the initial trauma and the surgery was 8.2 months. In fact, in our series, patients operating after 6 months had 10.5 times higher risk of retear compared to those which were operating within first 6 months of the trauma. The delay in treatment in our study was due to the mean time to initial presentation to an orthopedic surgeon was nearly 5 months after the injury. The reason for this delay was because, in the absence of a fracture around the shoulder, traumatic rotator cuff tears may often be missed on the emergency department and patients are often discharged without a correct diagnosis.A high percentage of these traumatic cuff tears are large or massive with retracted tendons, due to high amount of forces transmitted to the humerus at the moment of the trauma. After a long period of the initial trauma, these tears become chronic and may lead to severe disability. Thus, it was our main goal to treat our patients with traumatic mRCT as early as possible to prevent the condition from becoming chronic.However, the timing of surgery after delayed diagnosed traumatic RCT is still controversial. On the one hand, we must consider whether the tear is still repairable and, on the other, what results we can expect it we manage to repair it. We believe that preoperative repairability criteria do not provide definitive evidence of repairability but only provide insight into the difficulty of the repair. However, it is important to keep in mind that in the presence of advanced preoperative fatty infiltration, postoperative functional results are worse as we have seen in our series.Therefore, traumatic mRCTs should be repaired acutely because a delayed treatment leads to difficulties in surgery, higher rate of retear and less good results.

In Conclusion, delayed arthroscopic repair of traumatic mRCTs improves symptoms and functional outcomes. However, the rate of retear is high and surgery does not prevent the progression of fatty infiltration. The risk of retear increases by 10 when patients undergo surgery 6 months after the trauma. Pain relief improved even in the presence of retear. Functional results are better in the absence of preoperative advanced fatty infiltration.

	Age	Gender	Lat	HL	Colfix	H	Re	Duree symptômes	Douleur préop	Force Elev Pr	Force ER Pr	Force IR Pr	Douleur Préop	Force CS Pr	Force Elev Post	Force ER Post	Force IR Post	Douleur Post	Retear
1	52	M	Gd	ED	C	1	0	2	8	130	55	3	2	130	70	3	2	70	No
2	62	F	Gd	PED	C	1	0	2	7	140	60	4	3	140	70	4	2	70	No
3	65	F	Dr	ELH	D	2	0	1	6	150	70	4	3	150	80	4	1	80	No
4	70	M	Dr	PD	D	2	0	0.5	5	160	80	4	4	160	90	4	0	90	No
5	58	M	Gd	ELH	D	1	1	3	7	140	60	4	3	140	70	4	2	70	30 / 32
6	67	F	Dr	PED	C	2	1	4	8	130	55	3	3	130	70	3	2	70	30 / 32
7	55	F	Dr	PATA	C	1	0	0.2	3	160	80	4	4	160	90	4	0	90	No
8	63	F	Dr	PATA	C	1	0	1.5	5	150	70	4	3	150	80	4	1	80	No
9	60	F	Gd	PATA	C	1	0	1.5	6	140	60	4	3	140	70	4	2	70	No
10	65	M	Dr	ED	C	1	0	0.5	4	150	70	4	3	150	80	4	1	80	No
11	66	M	Dr	PATA	D	2	1	5	10	130	50	3	4	130	65	3	3	65	No
12	61	M	Gd	PATA	D	2	1	4.5	9	120	45	3	4	120	60	3	3	60	30 / 35
13	59	M	Gd	PATA	C	2	1	3.5	7.5	135	55	3	3	135	70	3	2	70	No

Table 1. Patient demographics, preoperative and postoperative clinical findings. (M: Male), (F:Female), (PD: Pseudoparesis), (ELH: Isolated loss of external rotation), (PATA: Painful functional shoulder), (Colfix C: supraspinatus-infraspinatus and upper third of the subscapularis tear), (Colfix D: supraspinatus-infraspinatus tear), (F1: Fatty infiltration Goutallier Classification), (Re: radiograph Hamada Classification), (Preop Elev: Preoperative Elevation), (Preop ER: Preoperative External Rotation), (Preop pain: Preoperative pain), (Preop CS: Preoperative Constant Score), (Postop Elev: Postoperative Elevation), (Postop ER: Postoperative External Rotation), (Postop Pain: Postoperative Pain), (Postop CS: Postoperative Constant Score), (SE: Supraspinatus tendon), (IS: infraspinatus tendon)

	Preoperative Status	Postoperative Status	Median difference	P value
Forward flexion, deg mean (±SD)	126 (27)	157 (36)	-30 (CI95% = [-50 ; -15])	0.008
External rotation, deg mean (±SD)	21 (17)	48 (24)	-27 (CI95% = [-45; 8.8])	0.009
VAS for pain, mean (±SD)	6 (1)	1.7 (2)	4.3 (CI95% = [4 ; 6]	<0.001
Constant Score, mean (±SD)	38 (8.4)	73 (19)	35 (CI95% = [-46 ; -26]	<0.001

Table 2. Comparative table of preoperative and postoperative values.

	Re-tear (n=8)	No Re-Tear (n=5)	P value
Gender male, n(%)	6 (75%)	2 (40%)	0.293
Age, mean (SD)	62.2 (±8.6)	63.4 (±10.8)	0.822
Tear Pattern, n(%)			0.293
Supra-Infra (Type-D)	6 (75%)	2 (40%)	
Supra-Infra-Subsc (Type C)	2 (25%)	3(60%)	
Goutallier			0.206
1	0	2 (40%)	
2	6 (75%)	2 (40%)	
3	2 (25%)	1(20%)	
Time to diagnosis, mean (SD)	5.3 (2.9)	3.6 (1.6)	0.265
Time to surgery, mean (SD)	8.7 (2.5)	6.2 (4.2)	0.199

Table 3. Comparative table of demographic variables between patients with retear and without retear.

	Re-tear (n=8)	No Re-Tear (n=5)	P value
Forward flexion, deg mean (SD)	148.7 (44.5)	170 (14.4)	0.535
External rotation, deg mean (SD)	36.2(22.5)	67(14.8)	0.021
Visual analog scale, mean (SD)	2.4(2.7)	0.8(1)	0.249
Constant Score, mean (SD)	67.2 (21.8)	81.6(8.7)	0.194

Table 4. Comparative table of functional results between patients with retear and without retear