

Arthroscopic Fixation of Isolated Type II Superior Labrum Anterior to Posterior (Slap) Lesions, Short-Term Results

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ABSTRACT:

BACKGROUND:

SLAP defined as separation of superior labrum from anterior to posterior, with or without the involvement of the attachment of the biceps tendon.

OBJECTIVE:

To assess the results of arthroscopic management of type II isolated SLAP tear using suture anchors in patients below forty years of age according to the University of California Los Angeles (UCLA) rating scale.

PATIENTS AND METHODS:

This is a prospective study conducted in the medical city directorate in Baghdad starting in October 2015 till October 2017, it included fourteen patients having dominant side type II SLAP tear, twelve males and two females, mean age was 31.8. All the tears fixed by arthroscopic suture anchor using the 2-ports technique. All patients evaluated by the (UCLA) scale preoperatively and one year after surgery.

RESULTS:

The UCLA shoulder rating scale regarding the pain relief, function and patient satisfaction showed significant improvement from 14.0 ± 2.8 preoperatively to 31.9 ± 1.9 one year postoperatively in all the patients with a P value < 0.0001 . One patient had post-operative anterior stitch infection treated by daily dressing and antibiotic.

CONCLUSION:

Arthroscopic repair of isolated type II SALP lesions by using suture anchors fixation and by two ports technique show favorable outcomes in term of function, pain relief and satisfaction of patients below 40 years in one year follow up.

KEYWORDS SLAP lesion, shoulder arthroscopy

INTRODUCTION:

The **SLAP** is tear of the "superior labrum from anterior to posterior". The biceps tendon- long head attachment- sometimes also involved⁽¹⁾. SLAP tears commonly recognized as a cause of painful shoulder with dysfunction mostly in athletic patients, and several mechanisms suggested for creating SLAP injuries⁽²⁾.

Traumatic assaults like "falling on an outstretched arm" or "motor vehicle accidents" and direct trauma or direct fall on the shoulder and upper limb traction injuries all were accused⁽²⁾, thrower athletes with frequent forceful overhead movements are also common victims⁽³⁾.

Recently, the "peel-back" mechanism also

confirmed, that is when the shoulder abducted and externally rotated and the biceps tendon is more vertical and in posteriorly directed orientation, it will convey a force to the superior labrum and peeling it off the glenoid causing SLAP tears⁽³⁾.

Snyder and colleagues (1990)⁽⁴⁾ classified SLAP tears in four types from I to IV, type II Lesions are the most common type it includes the detachment of the biceps-labral anchor from the bony glenoid of the shoulder. It accounts for about 55% of all lesions. Morgan and co-workers (1998)⁽⁵⁾ subdivided them into "three subtypes, according to the location of the superior glenoid labrum injury: IIA anterior 37%, IIB posterior 31% and IIC combined 31%" clinical assessment is generally nonspecific in SLAP lesions,

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and the MRI can be of help although it can be misleading. Arthroscopy found to be the gold standard for diagnosis during which an unstable biceps anchor will displace when pulled and arch away from the superior glenoid 5 mm or more, normal sublabral holes, cord-like middle glenohumeral ligaments, and Buford complexes will similarly appear without significant fraying or hemorrhage⁽⁶⁾. A positive “drive through sign” or being able to move the arthroscope from superiorly to inferiorly may also indicate laxity of the ligament support a SLAP tear⁽⁷⁾.

PATIENTS AND METHODS:

This is a prospective descriptive case series that was conducted in Ghazy AL-hariri hospital for specialized surgeries and the Nursing home in Baghdad medical city through the period from October 2015 to October 2017. Written informed consent had been taken from all patients whom suffered from isolated type II SLAP lesion after careful explanation about method of management.

We included Patient who are less than 40 years old having at least one positive clinical test for SLAP lesion (Active Compression / O’Briens’s, the compression-rotation, the biceps load II, The pronated load, The resisted supination

external rotation) and proved to have isolated type II SLAP lesion by arthroscopic assessment. All Patients had at least one year follow-up postoperatively.

We excluded patients who had Glenohumeral arthritis, tears of the rotator cuff, posterolateral impingement of glenoid, Recurrent instability, SLAP tears other than type II, patients with any shoulder surgery other than diagnostic arthroscopy.

Eighteen patients who suspected to have SLAP tear in the outpatient clinic by history (mechanism of injury, pain), physical examination and imaging (x-ray and MRI) were examined by arthroscopy and proved to have isolated type II SLAP lesions, All of those treated by arthroscopic suture anchor fixation by two ports technique, of those four patients were excluded as they do not completed the one year follow up.

Of our 14 patients, 12 patients were males (10 workers and 2 students) and 2 females, with a mean age 31.8 years (range 22 to 38 years). All the lesions were in their dominant arm (13 of patients were right side and only 1 left side) as shown in table 1.

Table 1: patient details

Case no.	Age	Gender	Slap type	Dominant R/L arm	Occupation
1	34	M	A	D RIGHT	worker
2	24	M	A	D RIGHT	worker
3	37	M	A	D RIGHT	worker
4	30	M	B	D RIGHT	worker
5	36	M	A	D RIGHT	worker
6	33	F	A	D RIGHT	Housewife
7	22	M	A	D RIGHT	Student
8	38	M	A	D RIGHT	worker
9	30	M	B	D RIGHT	worker
10	35	F	A	D LEFT	Housewife
11	38	M	C	D RIGHT	worker
12	23	M	A	D RIGHT	Student
13	33	M	B	D RIGHT	worker
14	32	M	B	D RIGHT	worker

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All the patients were evaluated preoperatively and at one year postoperatively with use of University of California Los Angeles (UCLA) rating scale with its 4 parts including the pain, shoulder function, active forward flexion and its strength⁽⁸⁾.

Under general anesthesia and beach chair position all the patients had standard 2-port (anterior and posterior) shoulder arthroscopy and all received pre- induction prophylactic antibiotics injection. Diagnostic arthroscopy was performed to confirm the diagnosis and to exclude any concomitant pathology, superior labrum and superior glenoid were roughened and prepared. All the repairs done with push-lock suture anchors.

Three different suture anchor configurations were used to repair the isolated type II SLAP lesions (A) one double loaded suture anchor anterior to the biceps tendon, (B) one double loaded suture anchor posterior to the biceps tendon, or (C) double loaded anterior and posterior suture anchors. After the repair, closure of portals done with nylon suture followed by surgical dressing. In the operating theater the arm held in a sling with minimal external rotation and kept for four weeks.

Pendulum shoulder exercises with elbow, wrist, and hand motion started immediately. shoulder physiotherapy starts after one month concentrating on range of motion and muscle strengthening.

Analysis of data done by the use of the statistical package of SPSS-24. Descriptive analysis of Data were presented and included the frequency, percentage, mean, standard deviation, and range (minimum-maximum values).

The significance of mean differences (quantitative data) tested using Paired-t-test. The significance of percentage differences (qualitative data) tested by Pearson Chi-square test (χ^2 -test) and Yate's correction or Fisher Exact test as required. Statistical significance measured with the P value equals or below 0.05.

RESULTS:

The number of patients involved in our study was 14 patients. All patients were isolated type II SLAP lesions , 12 patients were males and 2 females , with mean age and standard deviation of 31.8±5.4 years (range 22 to 38 years), all the patients were in their dominant arm (13 of patients were right side and only 1 left side), as in table 2.

Table 2: The age, gender, arm sides affected, and SLAP type

		No (%)
Age (years)	<30	3(21.4)
	30--34	6(42.9)
	35--40	5(35.7)
	Mean±SD (Range)	31.8±5.4(22-38)
Gender	Male	12(85.7)
	Female	2(14.3)
Arm side	Right	13(92.9)
	Left	1(7.1)
Slap type	Slap A	9(64.3)
	Slap B	4(28.6)
	Slap C	1(7.1)

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Table 3 shows the results of the UCLA shoulder rating scale details pre and post-operatively.

Table 3: The UCLA shoulder rating scale details pre & post-operatively

	Pre-op	Post-op
Section 1 "Pain"	No (%)	No (%)
Continuously present, unbearable, frequent use of strong medications	-	-
Continuously present, bearable, occasionally use of strong medications	6(42.9)	-
No pain or less pain during rest or light actively frequent use of salicylates	4(28.6)	-
Pain during hard activities isolated, occasional use of salicylates	4(28.6)	-
Occasional or not significant	-	5(35.7)
No pain	-	9(64.3)
Mean±SD	3.7 ±1.7	9.2±0.9
Section 2 "Function"		
Incapacity to use the arm	-	-
Possible only for light activities	2(14.3)	-
Capable of performing light tasks of the majority of daily activities	9(64.3)	-
The majority of home tasks, drive, comb, dress, or undress	3(21.4)	-
Only few restrictions, can perform work above the level of shoulder	-	11(78.6)
Normal activities	-	3(21.4)
Mean±SD	4.1±1.2	8.4±0.8
Section 3 "Active Forward Flexion"		
<30	-	-
30---45	-	-
45---90	2(14.3)	-
90---120	11(78.6)	-
120---150	1(7.1)	10(71.4)
>150	-	4(28.6)
Mean±SD	2.9±0.4	4.2±0.4
Section 4 "Strength of Forward Flexion"		
None	-	-
Muscular contraction	-	-
Bad	-	-
Moderate	11(78.6)	-
Good	3(21.4)	2(14.3)
Normal	-	12(85.7)
Mean±SD	3.2±0.4	4.8±0.3
Section 5 "Satisfaction of Patient"		
Not satisfied or worse	14(100)	-
Satisfied or better	-	14(100)
Mean±SD	0	5

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The **pain score** of patients showed (3.7 ± 1.7) range (2-6) to post-operative (9.2 ± 0.9) range (8-10), as shown in figure 1.

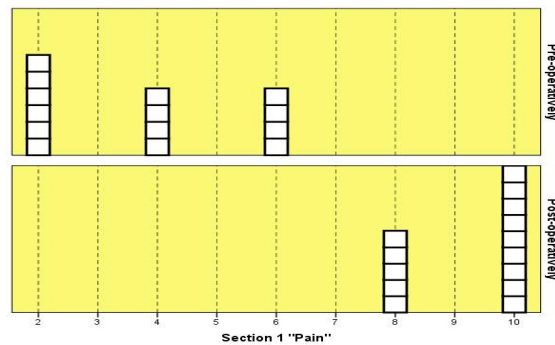


Figure 1: The Section 1 "Pain"-UCLA shoulder rating scale distribution pre & post-operatively (each white rectangle is for one patient)

The **function score** of patients increased from $mean \pm sd$ 4.1 ± 1.2 (range 2-6) to 8.4 ± 0.8 (range 8-10), as shown in figure 2.

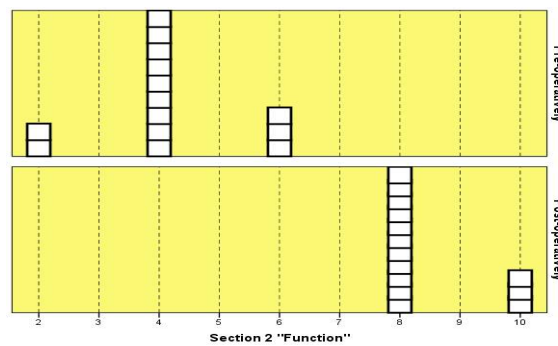


Figure 2: The Section 2 "Function"-UCLA shoulder rating scale distribution pre & post-operatively (each white rectangle is for one patient)

The **active forward flexion score** showed good improvement from $mean \pm sd$ 2.9 ± 0.4 (range 2-4) to 4.2 ± 0.4 (range 4-5), as shown in figure 3.

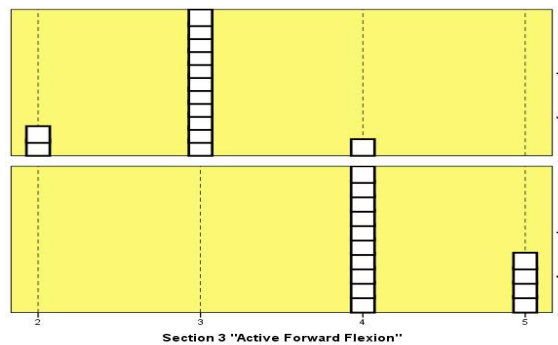


Figure 3: The Section 3 "Active Forward Flexion"-UCLA shoulder rating scale distribution pre & post-operatively (each white rectangle is for one patient)

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The strength of forward flexion score improved (range 4-5), as shown in figure 4. from mean±sd 3.2±0.4 (range 3-4) to 4.8±0.3

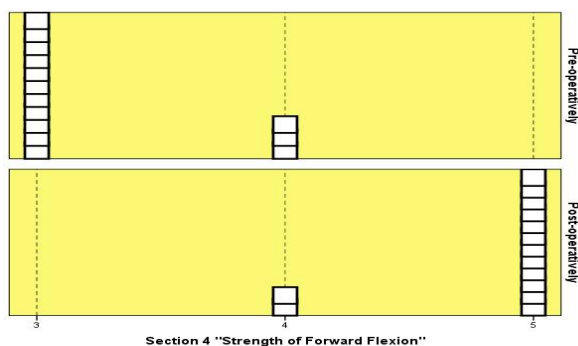


Figure 4: The Section 4 "Strength of Forward Flexion" -UCLA shoulder rating scale distribution pre & post-operatively (each white rectangle is for one patient).

The UCLA shoulder rating scale showed highly significant improvement from a per-operative 14.0±2.8 (range 9-18) increased to 31.9±1.9 (range 29-35) following the surgery at final one year follow up and the P value was <0.0001

as shown in table 4.

There is only one patient who had post-operative anterior stitch infection treated by daily dressing and antibiotic.

Table 4: The UCLA shoulder rating scale distribution pre & post-operatively

UCLA shoulder rating scale		Pre-op	Post-op
9		1(7.1)	
11		1(7.1)	
12		3(21.4)	
13		2(14.3)	
14		1(7.1)	
15		2(14.3)	
16		1(7.1)	
18		3(21.4)	
29		-	2(14.3)
30		-	2(14.3)
32		-	6(42.9)
33		-	2(14.3)
35		-	2(14.3)
Mean±SD (Range)		14.0±2.8 (9-18)	31.9±1.9 (29-35)
Median		13.5	32.0
P value		<0.0001	
UCLA shoulder rating scale		Pre-op	Post-op
Unsatisfactory results (Poor/Fair "<27")		14(100)	-
Satisfactory results (Good/Excellent ">27")		-	14(100)

DISCUSSION:

A survey of the literature after arthroscopic treatment of type II SLAP lesions demonstrates an evolution in treatment ranging from debridement only to anchor fixation which gave good clinical outcomes. In a report on 140 superior labral injuries, Snyder and colleagues (1990)⁽⁴⁾ described the transition from treatment of the type-II lesions with debridement (in the first 56% of the patients) to repair with suture anchors in the remaining patients and the arthroscopic repair gave good clinical outcomes in term of function, pain relief and satisfaction of patients⁽⁴⁾.

Morgan and his co-workers (1998)⁽⁵⁾ who retrospectively reviewed a series of 102 patients who were managed with arthroscopic repair of a type-II SLAP lesion with use of suture anchor fixation reported a 97% rate of good or excellent outcomes at one year after surgery.

Same wise Kim and his group (2002)⁽⁹⁾ retrospectively evaluated thirty-four patients who had been managed with arthroscopic suture anchor repair and noted satisfactory outcomes according to the University of California at Los Angeles (UCLA) shoulder score in 94% of the patients. And Recently, Enad and colleagues (2007)⁽¹⁰⁾ reported favorable clinical results (a good or excellent outcome in twenty-four of twenty-seven patients) and a high rate of return to full duty in a series of military patients who had been managed with arthroscopic suture anchor repair of type-II superior labral injuries.

Yung P et al (2008)⁽¹¹⁾ in their study they evaluated the clinical and functional outcomes of arthroscopic repair for 16 patients (mean age 24.2± 6.5) with isolated type II SLAP lesions. The study depended on UCLA for assessment all patients pre-operative and 28 months post-operative follow up. They founded that the total UCLA score increased after surgery and was statistically significant.

Friel N et al (2010)⁽¹²⁾ in their prospective study of 48 patients with mean age 33.1 years underwent arthroscopic repair for isolated type II SLAP by suture anchor fixation at minimum two years follow up. concluded that , arthroscopic repair of type II SLAP lesions provides a significant improvement in both functional capacity and pain relief and suggesting that

SLAP type II repair is showing good results.

Most of the above series seems to be consistent with the results of this study.

It's agreed that younger patients with type II lesion had better prognosis following arthroscopic repair with suture anchors. Denard, Ladermann and Burkhart (2012)⁽¹³⁾ in their retrospective study of 55 patients with isolated type II SLAP lesions treated by arthroscopic repair for long-term follow-up at a mean of 77 months. The mean age of the patients was 39.7 years, 23 patients were aged younger than 40 years, and 32 patients were aged > 40 years. The results toward better outcomes were seen in the patients under-40 years according to UCLA score. They concluded that , higher rate of complications (stiffness ,the need for reoperation) and decrease in satisfaction had been occur in patients over 40 years old compared with patients < 40 years.

Isolated SLAP II lesions associated with better surgical outcome as compared to patients with associated shoulder injuries that are commonly seen in practice. Franceschi et al (2008)⁽¹⁴⁾ in their study of 63 patients with type II SLAP lesions associated with rotator cuff tears in patients over 50 years at 2.9 years follow-up after arthroscopic repair. They concluded that, no advantages in repairing a type II SLAP lesion when associated with a rotator cuff tear in patients over 50 years of age.

Its well noticed that when SLAP II lesions are isolated a better results of arthroscopic suture anchor fixation in to be expected^(9,13,15).

In this study, SLAP lesions were more frequent among males (85.7%), it affected the dominant limb and were generally secondary to a traumatic mechanism. This may attributed to the fact that males are more subjected to athletic and heavy duty work in comparison to females in our community. This study also showed prevalence of subtype A as there were 64.3% IIA, 28.6% IIB and 7.1% IIC, these results comes in agreement with Morgan and his co-workers (1998)⁽⁵⁾ who stated that the most common subtype is IIA while he found equal percentage for type IIB and IIC, this may attributed to small sample size in this study.

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Several other authors also agreed with the prevalence of SLAP tears in male gender^(16,17). The small sample size and short follow up period was the main limitations of this work.

CONCLUSION:

Arthroscopic repair of isolated type II SALP lesions by using suture anchors fixation and by two portal technique show favorable outcomes in term of function, pain relief and satisfaction of patients below 40 years in one year follow up.

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