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Treatment Of A Work-Related Superior Glenoid Labral Repair: A Case Report

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1 **Treatment of a Work-Related Superior Glenoid Labral Repair:**

2 **A Case Report**

3
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7
8 The patient signed all informed consent allowing the use of her medical history for this case
9 report. She received information from the university’s Health Insurance Portability and
10 Accountability Act (HIPAA) policies.

11
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14 assistance with patient management, and the patient for willingness to participate in the case
15 report.

16 **Key Words:** Superior glenoid labral/labrum repair, SLAP lesion, physical therapy, joint
17 mobilizations

24 **Abstract**

25 Background and Purpose: A superior glenoid labrum tear anterior to posterior (SLAP) is a
26 common injury in the shoulder although they are less commonly seen in the workplace. There
27 are many resources for SLAP lesions concerning overhead throwing athletes, however, there are
28 not specific details on return to work rehabilitation activities for the workers' compensation
29 population. The purpose of this case report is to explore the post-operative physical therapy
30 management of a workers' compensation patient with a superior glenoid labrum lesion.

31 Case Description: This patient was a 45-year-old Hispanic female diagnosed with a superior
32 glenoid labrum lesion of the left shoulder requiring surgical repair. This was a work-related
33 injury covered under Workers' Compensation. The patient's main concerns were the inability to
34 lift, carry, reach, push, and pull with the left upper extremity. She had pain, weakness, and
35 limited joint mobility. The interventions performed were joint mobilizations, manual therapy,
36 therapeutic exercises, modalities, and a home exercise program under the direction of the
37 surgeon's rehabilitation protocol.

38 Outcomes: The patient's pain decreased from an 8/10 at worst at her initial evaluation to a 3/10
39 at discharge. Her DASH score improved; it went from a 70/100 initially to a 50/100. The SPADI
40 score also improved it went from 112/130 to 54/130.

41 Discussion: The plan of care appeared successful as the patient had decreased pain, increased
42 strength and range of motion, and she was able to return to full-duty work. Further research is
43 needed to determine the long-term benefits of this intervention program for this patient
44 population. SLAP lesions are rare in the work-setting compared to those in overhead throwing
45 athletes and more research is needed to find additional and optimal treatment methods.

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47 **Introduction/Background and Purpose**

48 A superior glenoid labrum tear anterior to posterior (SLAP) is a common injury in the
49 shoulder joint. Traumatic mechanisms that produce SLAP lesions include falling on an
50 outstretched arm, a direct blow to the shoulder, a sudden pull from lifting a heavy object, and a
51 violent overhead reach, such as when trying to stop a fall.¹ SLAP lesions were present in 55%
52 and 72% of the population observed.² SLAP lesions have a reported prevalence between 3.9%
53 and 11.8% in arthroscopic studies² without differences in age ($P = .87$) or sex ($P = .41$).² The
54 highest incidences of superior labrum tear from anterior to posterior (SLAP) lesions occur in
55 individuals from 20-29 years old and 40-49 year olds, with an average age being 37.5 years.³
56 Common signs and symptoms of this injury include a sense of instability in the joint, shoulder
57 dislocations, pain with overhead activities, catching, locking, popping or grinding, occasional
58 night pain or pain with activities of daily living (ADLs), decreased range of motion (ROM), and
59 loss of strength.¹

60 SLAP lesions are less commonly seen in the workplace.⁴ The typical mechanism of injury
61 is handling weight above the head.⁴ The long-term outcome after arthroscopic repair of type II
62 SLAP lesion according to age and worker's compensation status were reported.⁵ It was stated
63 that overall patient satisfaction with the long-term outcome after the lesion repair was reported in
64 91% of the cases in the study and return to normal sport or activity was reported in 82% of the
65 cases.⁵

66 This case report is unique and necessary because it represented a work-related non-
67 traumatic superior glenoid lesion. There is a vast amount of resources for SLAP lesions
68 concerning overhead throwing athletes and there are many articles about how rehabilitation for

69 this post-operation injury is important.^{2,3,6,7} However, there are not specific details in literature
70 on return to work rehabilitation activities for a workers' compensation SLAP lesion. There is
71 little detail about which specific joint mobilizations or therapeutic exercises are most beneficial
72 for this population. The purpose of this case report is to explore the post-operative physical
73 therapy (PT) management of a workers' compensation patient with a superior glenoid labrum
74 lesion.

75

76 **Patient History and Systems Review**

77 The patient provided consent to participate in this case report. This patient was a 45-year-old
78 Hispanic female, who was right-handed, and married with children. This was a work-related
79 injury covered under Workers' Compensation. The patient did not report any significant medical,
80 family, or psychosocial history. Medical history included hypertension and high cholesterol, for
81 which she was taking medications for; it was unknown which medications she was taking.

82 This patient's diagnosis was a superior glenoid labrum lesion of the left (L) shoulder
83 requiring surgical repair. The patient worked in the produce department at a local grocery store.
84 She stated that over time, she developed L shoulder pain and dysfunction from the duties of her
85 work, which she included to be lifting, carrying produce, and cutting fruit. The injury occurred
86 approximately four years prior. The patient received PT one year ago for this subsequent
87 shoulder injury pre-operation; the outcomes were unsuccessful, and the patient required surgery.
88 She had been out of work since the date of the injury. She was recovering from the labral repair
89 that was performed a month prior to this evaluation. The patient's surgeon provided a protocol
90 for the PT to follow (Table 1).

91 A systems review was completed during the initial evaluation (IE) (Table 2). At the IE, the
92 patient was in a sling and swathe. She had the inability to use the L shoulder due to MD
93 restrictions as well as pain, weakness, and limited joint mobility. She reported that she had pain
94 that traveled down to the L elbow. The patient's main concerns and symptoms were the inability
95 to lift, carry, reach, push, and pull with the L upper extremity (UE). She also had the decreased
96 ability to dress, bathe, cook, and clean due to only being able to use one UE for these tasks. She
97 experienced disturbed sleep due to the pain.

98 The patient had a good outlook. Her goals for PT were to have a fast recovery, decrease her
99 pain, and to get back to work. The primary problem for this patient was the pain and decreased
100 ROM. Her diagnosis was clearly defined, and she subsequently required surgery.

101 The plan for examination was to continue with active and passive ROM, as well as manual
102 muscle testing (MMTs)/gross muscle strength, based on the previous data discussed above. The
103 Shoulder Pain and Disability Index (SPADI) and the Disabilities of the Arm, Shoulder, and Hand
104 Questionnaire and (DASH) outcome measures should be used, as well, in order to track progress
105 that this patient will make from the IE to her discharge. This patient was a good candidate for a
106 case report because this is both a common injury and a common surgery seen in outpatient
107 orthopedic PT. This patient had a good outlook on her PT rehabilitation.

108

109 **Examination – Tests and Measures**

110 Examination procedures that are consistent with the plan and that were used for this
111 patient are ROM using a goniometer, both passive and active, as well as MMTs, and the pain
112 rating scale. The outcome measures that were utilized were the Disabilities of the Arm, Shoulder,

113 and Hand Questionnaire (DASH)⁸ and the Shoulder Pain and Disability Index (SPADI).⁹ The
114 DASH was designed to assess musculoskeletal disorders of the upper limbs.⁸ The SPADI was
115 developed to assess pain and disability related to shoulder problems.⁹ The patient completed the
116 SPADI and the DASH at her IE in June of 2019. She scored a 70/100 on DASH and 112/130 on
117 SPADI. The SPADI test/retest reliability is 0.64 to 0.66, the criterion validity
118 (predictive/concurrent): SPADI score and AROM show moderate – high correlation, correlations
119 ranged from -0.55 to -0.80.⁹ The construct validity had correlation with active range of motion =
120 0.54 to 0.80.⁹ For the DASH, the convergent validity for adults with musculoskeletal range of
121 motion problems: 0.67-0.71.⁸ The test-retest reliability for general population for the DASH is
122 0.94-0.98.⁸

123 Gross muscle strength/MMTs were performed in order to grade the strength of the
124 injured shoulder in comparison to the non-involved arm (Table 3). It was reported that the
125 MMTs employed by chiropractors, PTs, and neurologists was shown to be a clinically useful
126 tool.^{10,11} Its ultimate scientific validation and application requires testing that employs high-level
127 research models in the areas of biomechanics and statistical analysis.^{10,11}

128 The pain-rating scale was also used, and it is scored from 0-10 (0=no pain, 10=worst
129 pain) and this patient reported a 6/10 at best and an 8/10 at worst during the IE. It has been
130 reported, that the pain rating scale has a high test–retest reliability.¹² This has been observed
131 in both literate and illiterate patients with rheumatoid arthritis ($r = 0.96$ and 0.95) before and
132 after medical consultation.¹²

133 Goniometry measurements were also performed for the shoulder and elbow ROM. It has
134 been reported that, goniometry measurements for the UE are more reliable than lower extremity

135 measurements.¹⁰ Inter-rater reliability measurement error should be less than five degrees when
136 the same examiner is testing at every session and when different professionals are measuring the
137 same joint, the measurement error is probably greater than five degrees.¹⁰

138

139 **Clinical Impression: Evaluation, Diagnosis, Prognosis**

140 The patient presented with a superior glenoid labral tear of the L shoulder with
141 subsequent surgical repair. Based on the objective findings during the IE, the patient's symptoms
142 were consistent with the initial presentation. This patient remains a good candidate for this case
143 report because this was a work-related injury, she needed targeted rehab in order to return to
144 work, and there is a high prevalence of superior glenoid labral tear/repairs seen in the outpatient
145 PT setting. This patient had impairments with lifting, carrying, and moving her arm in certain
146 positions. These impairments limited her from going back to work, as she was unable to lift or
147 cut produce, which is what her job consisted of. These factors were thought to lead to a
148 decreased independence in this patient's functional mobility. The scores on the DASH and
149 SPADI suggest high levels of pain, difficulty, and disability.^{8,9} Ultimately, her pain and limited
150 functional mobility contributed to her inability to work and fulfill her roles within her home.

151 The plan for intervention was to progress the patient based on the MD's rehabilitation
152 protocol (Table 1). The measurements of ROM were completed at every quarter checkpoint in
153 order to monitor the patient's progress. At visit 10, the patient had a re-evaluation. This was
154 when the outcome measures were re-administered to the patient to see how much functional
155 progress she had made.

156 Given this patient's musculoskeletal impairments she was given the primary

157 medical/physical therapy diagnosis of, “Superior Glenoid Labrum Lesion of Left Shoulder,
158 Subsequent Encounter.” The relevant ICD-10-code was: S43.432D.

159 This patient’s prognosis was good. This patient had intact cognition, she had good family
160 support and help at home, and she was motivated and interested in participating in PT. These
161 factors were considered positive prognostic indicators. A possible barrier to treatment would be
162 her chronic pain, as she was experiencing this injury and subsequent pain and impairments since
163 2015. In a study regarding chronic pain post shoulder surgery, it was reported that these patients
164 process and modulate pain differently and have a suprathreshold pain response which could play
165 a role in the development in postsurgical pain.¹³ Dodson and Altchek reported, that
166 approximately 90% of these SLAP lesion surgical patients had good or excellent results at the
167 short to intermediate follow-up post-operation.¹⁴

168 The recommended treatment period for this patient was 2-3 times per week, as needed,
169 for one-hour sessions, for 12-16 weeks. If the patient’s ROM or strength were not responding to
170 treatment, then her MD would have been consulted. A PT re-evaluation was completed every 30
171 days or every 10 PT sessions. During the PT re-evaluations the same tests and measures that
172 were taken at the IE were used in order to look for any improvements in terms of the patient’s
173 ROM, pain, function, and strength; the plan of care (POC) was modified as needed. The patient
174 progression will include manual therapy, manual stretching, PROM, and soft tissue mobilization
175 (STM). The therapeutic exercises that were completed focused on ROM initially. Strengthening
176 exercises at week six followed these exercises. Modalities were used for pain and swelling.

177 The short-term goals for this patient included increasing ROM, strength, decreasing pain,
178 and completing the home exercise program (HEP) independently. The long-term goals for this

179 patient included lifting some objects with the affected arm, improving strength, ROM, and pain
180 (Table 4).

181

182 **Intervention and Plan of Care**

183 **Coordination, Communication, Documentation**

184 Coordination of care for this patient included communication with her MD who referred
185 her to PT, including sending copies of her IE and re-evaluations every 30 days or every 10 PT
186 sessions. Daily notes were documented at each patient visit. Rehabilitation technicians were
187 instructed on the patient's therapeutic exercises and assisted her on several occasions.

188

189 **Patient Related Instruction**

190 The patient was educated about her diagnosis, surgery procedure, ROM restrictions per
191 the MD, her POC, treatment interventions, and the importance of consistent PT visits. She was
192 instructed on a HEP. The patient reported good understanding and compliance with her HEP.

193 Towards the end of therapy, the patient's ability to self-manage her symptoms improved
194 as she became more independent with her HEP. The patient was given copies of her HEP and
195 updated copies if any exercises were added.

196

197 **Procedural Interventions**

198 The patient attended PT two times a week for 12 weeks, totaling 24 visits. These one-
199 hour treatment sessions included strengthening, stretching, manual therapy and ES (Table 5).

200 ROM exercises were completed at week one. Due to the patient's diagnosis, the MD

201 provided a protocol that was followed for PT treatment and progression. Treatment was based on
202 increasing the shoulder ROM and mobility followed by increasing the strength. During the initial
203 stages post-surgery, the goals were to decrease the pain and inflammation and to protect the
204 labrum repair.¹⁵ After the full ROM was gained, the gradual increase of strengthening exercises
205 was initiated. After the shoulder strength had returned to almost comparable to her non-affected
206 arm, the gradual return to prior level of activities was initiated (Figure 1).

207 Mobility exercises were completed beginning week two. The patient completed several
208 mobility exercises, such as the supine wand flexion, which started out with the table completely
209 flat and then was progressed to elevation starting at 30°. Another exercise that was completed
210 was the external rotation (ER) stretch at the wall. These exercises were progressed as time went
211 on and as the patient was able to move her arm more. These activities were performed in order to
212 increase her ROM and relieve pain.

213 Strengthening exercises were completed beginning week eight. For example, standing
214 scapular retraction with a theraband (TheraBand, Akron, OH) was performed. The patient was
215 instructed to stand with a slight bend in her knees and as she pulled the theraband back, she was
216 told to focus on squeezing her shoulder blades together while maintaining her posture. This
217 exercise was progressed by increasing the resistance of the theraband (yellow, green, red).
218 Another exercise in this category was the arm bike - UBE (BioDex, Shirley, NY). The patient
219 was told to push the arm handles forward for two minutes and then pull them backwards for two
220 minutes. The goal for this exercise was to increase her endurance in the muscles of the shoulders
221 and upper back.

222 Manual therapy was initiated week one. The PT as well as the student PT performed

223 STM in order to reduce the patient's muscle guarding, tenderness, and muscle tone in her
224 shoulder region. Manual passive stretching of the shoulder was also performed in order to
225 increase the ROM without the muscles actively firing, which could lead to damage. There were
226 positive changes noted in terms of the patient's muscle tone in the shoulder through her episode
227 of care.

228 Grade I-II joint mobilizations were utilized with this patient. In the article by Kahanov &
229 Kato,¹⁷ it was stated that joint mobilizations are used to modulate pain and increase the joint
230 mobilization. Joint Mobilizations enhance the flexibility of the soft tissues and the mobility of
231 the joints.¹⁷ It was indicated for reversing joint hypomobility, maintenance of joint mobility
232 when full-range active motion is not possible, progressive stiffness from disuse, and relieving or
233 diminishing pain.¹⁷ This was utilized for the neurophysiological effects.¹⁷

234 Grimsby and Rivard¹⁸ suggested, that the use of joint articulation or oscillation within the
235 range of normal joint play in a joint capsule is very effective.¹⁸ This range is considered to be a
236 Grade I (small-amplitude movement performed at the beginning of the range) and II (large-
237 amplitude movement performed within the range) joint mobilization.¹⁸ This patient had the most
238 limitation with the abduction and ER ranges, so the mobilizations performed were specific for
239 these motions. Grade I-II joint mobilizations were used for this patient based on the above
240 research; they were performed at a rate of two oscillations per second for 20 repetitions. (Figure
241 2).

242 Modalities were used throughout the plan of care. The modalities that were used were
243 electrical stimulation (ES), which was administered to the patient in the form of premodulated
244 interferential current (PIC). The ES device that was utilized for this patient was the Chattanooga

245 Intellect Legend Stimulator (Chattanooga Medical Supply, Chattanooga, TN). Thomason and
246 Booth¹⁶ determined that skeletal muscle dysfunction such as declining strength and endurance is
247 associated with morphological changes including the loss of muscle mass and reduced cross-
248 sectional area of the muscle fibers. This muscle atrophy results from several conditions for
249 example, inactivity, immobilization, denervation, and spinal cord injury.¹⁷ ES is often used as a
250 preventative measure in these instances and there are different forms of ES that can be used.
251 Tanaka et al.¹⁹ determined that PIC is more comfortable for the patient while generating a greater
252 muscle torque in comparison to ES using a pulsed current.¹⁹ This patient was experiencing
253 muscle atrophy post-operation due to the immobilization of her arm which is why PIC was
254 utilized. The frequency applied was 80-150 Hz and the intensity was a strong, but comfortable
255 sensation determined by the patient. The duration was 15 minutes done in combination with
256 vasopneumatic compression early on and then switched to MHP later. Two electrodes were placed
257 on the front of the shoulder and two were placed on the back of the shoulder.

258

259 **Timeline**

260 See Figure 2 - Timeline.

261 **Outcomes**

262 The patient reported reduction of symptoms and continuous progress throughout the episode
263 of care. Upon discharge, the objective measures showed improvement in shoulder ROM,
264 strength, pain levels, muscle tenderness and tone (Table 3). The most positive findings were that
265 the patient had achieved nearly normal shoulder ROM and strength at discharge, as well as the
266 improvement displayed in the outcome measures from the initial evaluation to discharge (Table

267 3). The patient's pain levels had decreased from an 8/10 at the worst initially, to a 3/10 at the
268 worst upon discharge (Table 3). The patient also met all short and long-term goals (Table 5). She
269 reported increased ability to lift, carry, and perform self-care activities with the affected arm. At
270 discharge, the patient had returned to full-duty work and continued to have relief of symptoms
271 with the continuation of her HEP. The patient expressed her intent to continue with her HEP in
272 order to manage her residual symptoms and agreed to return to PT if her symptoms exacerbated.
273 There were no adverse or unanticipated events that occurred during her episode of care.

274

275 **Discussion**

276 This case report portrayed the management of a patient with a superior glenoid labrum
277 lesion of the left shoulder requiring surgical repair. The management consisted of joint
278 mobilizations, manual therapy, therapeutic exercises, modalities, and a HEP. The patient's POC
279 was created based off the protocol provided by her surgeon, as well as research evidence and
280 clinical experience from working with patients with similar injuries requiring surgical repair. The
281 POC appeared successful as the patient had decreased pain, increased strength and ROM, and
282 she was able to return to full-duty work following her episode of care. Considerations that may
283 have positively influenced the patient's treatment included high prior level of function,
284 compliance with her HEP, good overall health, and the provided PT interventions. Possible
285 limitations that may have negatively affected patient outcomes included the issue that the
286 protocol from the surgeon was strict and was slow to progress. Also, this patient only came in for
287 PT twice a week, the results may have been even more positive and achieved at a faster rate if
288 she came to PT three times a week. This emphasized the importance of the patient to complete

289 her HEP in order to maintain her level of function that was achieved throughout her PT sessions.

290 The outcomes of this case were consistent with current research regarding the treatment
291 of this type of shoulder injury.¹⁵ This patient responded positively to the joint mobilizations and
292 therapeutic exercises given, as she experienced decreased pain and increased ROM and strength.
293 The patient continued to have some pain, she reported experiencing a 3/10 at worst at discharge.
294 The patient had been out of work for four years since the date of the initial injury and she
295 returned to full-duty work at discharge. The patient's DASH score improved; it went from a
296 70/100 initially to a 50/100 at discharge. The SPADI score also improved it went from 112/130
297 initially, to 54/130 respectively. HEP compliance seemed to be a contributing factor to the
298 success of treatment for this patient as well, she was able to relieve her symptoms at home and
299 self-manage. Research states that joint mobilizations are used to reverse joint hypomobility,
300 maintain joint mobility when full-range active motion is not possible, progress stiffness from
301 disuse, and to relieve or diminish pain.¹⁸ This patient had the most limitation with the abduction
302 and ER ranges, so the mobilizations performed were specific for these motions, which had great
303 success. The clinical implications of this case were that the joint mobilizations and mobility
304 therapeutic exercises in the presence of a post-operation SLAP lesion, appeared to be effective
305 for this patient. Further research is needed in order to determine the long-term benefits of the
306 mobility therapeutic exercises for this workers' compensation patient population of SLAP lesion
307 injuries. Due to the matter that SLAP lesion injuries are rare in the work-setting compared to the
308 amount seen in overhead throwing athletes,¹ more research is needed to find additional and
309 optimal treatment methods, as the resources are limited.⁴

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393 **Tables and Figures**

394 **Table 1. MD Protocol**

Quarter* One	Quarter Two	Quarter Three	Quarter Four
0-45° elevation	0-90° elevation	0-135° elevation	No limitations
No Limitations for IR/ER	No Limitations for IR/ER	No Limitations for IR/ER	

395 Internal rotation (IR), External Rotation (ER).

396 * This format was given by the surgeon; the quarters were represented by weeks which were not
 397 specifically given. *

398

399 **Table 2. Systems Review**

	Initial Evaluation Results	Discharge Evaluation Results
Cardiovascular/Pulmonary	Impaired <ul style="list-style-type: none"> • Hypertension • High Cholesterol 	No Change
Musculoskeletal	Impaired <ul style="list-style-type: none"> • Superior glenoid labral tear with surgical repair • Increased pain with decreased ROM • Decreased strength • Tenderness to palpation of the anterior and posterior left shoulder 	WNL
Neuromuscular	WNL in terms of balance, transfers, and locomotion. Patient is alert and oriented. Sensation intact bilaterally. <ul style="list-style-type: none"> • Increased muscle tone of the left shoulder, biceps, triceps, and flexors/extensors of the left arm 	WNL
Integumentary	WNL <ul style="list-style-type: none"> • Scar formation from surgery – well healed scars • Normal skin color - no edema 	WNL
Communication	WNL	WNL

	<ul style="list-style-type: none"> • Language barrier • Patient understands most English - occasionally requires English to Spanish translation 	
Affect, Cognition, Language, Learning Style	WNL – intact cognition. <ul style="list-style-type: none"> • Patient reported to learn best by demonstration and verbal learning style 	WNL

400 Range of motion (ROM), within normal limits (WNL).

401

402

403

404

Table 3. Tests & Measures

Tests & Measures	Initial Evaluation Results	Discharge Evaluation Results
Shoulder ROM		
Flexion (normal: 180°)	40° AAROM & 45° PROM	150° AROM 165° PROM
Extension (normal: 45-60°)	20° extension PROM	Full = 60° PROM and AROM
Abduction (normal: 150-160°)	35° abduction PROM	150° AROM 160° PROM
Internal Rotation (normal: 70-90°)	Hand behind back - to left gluteus.	Hand to 10 th thoracic vertebrae
External Rotation (normal: 90°)	5° PROM	70° PROM
	Elbow ROM WNL	*Elbow ROM WNL*
MMT		
Shoulder muscle strength	2/5 grossly overall	4+/5 grossly overall

Elbow muscle strength	Flexion, extension, supination/pronation: 3/5.	5/5
Wrist muscle strength	Flexion, extension, radial deviation, ulnar deviation: 3+/5.	5/5
Palpation for Tenderness	Grade II tenderness L anterior and posterior shoulder, near incision sites. L deltoid, L posterior rotator cuff.	Mild tenderness at posterior rotator cuff.
Palpation for muscle tone	Moderately increased L shoulder complex musculature, including L upper trapezius.	Mildly increased muscle tone at posterior rotator cuff.
Numeric Pain Rating Scale (0-10)		
At Best	6/10	0/10
At Worst	8/10	3/10
DASH	70/100	50/100
SPADI	112/130	54/130

405 Left (L), passive range of motion (PROM), active range of motion (AROM), manual muscle
 406 testing (MMT), active assisted range of motion (AAROM), range of motion (ROM), within
 407 normal limits (WNL), Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH),
 408 Shoulder Pain and Disability Index (SPADI).

409

410 **Table 4. Interventions & Parameters**

	Rx Week 1	Rx Week 2	Rx Week 3	Rx Week 4	Rx Week 8 (featuring higher level exercises only)

<p>Mobility</p>	<p>Education and instruction on ROM limitations</p> <p>Pendulums x 30 cw/ccw</p> <p>Shoulder extension w/ wand x 15</p> <p>Elbow Flexion/Extension x 15</p> <p>Posture Corrects x 15</p> <p>Shoulder Circles x 15 fwd/bwd</p> <p>Wand IR/ER x 15</p> <p>Chin tucks x 15</p> <p>Scapular Retractions x 15</p>	<p>AAROM flexion/abduction with pb on table x 8</p> <p>Pulleys flexion x 20</p>	<p>AAROM with pb flexion, into abduction/adduction x 20</p> <p>Walking w/ arm swing 4 laps</p>	<p>Sidelying ER x 15</p>	<p>Standing behind head ball pass for ER with 3 lb. ball - 2 mins</p> <p>PNF pattern D2 flexion - standing with 2 lbs. x 15</p>
<p>Strengthening</p>	<p>Hand Putty x 3 mins</p>	<p>Scapular retractions w/ Green TB x 15</p>	<p>Prone Rows and Extension x 15</p> <p>Wall ball circles cw/ccw x 15</p>	<p>Upper Extremity Bike 2 mins fwd/2 mins bkwd</p> <p>Bicep Curls x 10 w/ 2lbs.</p> <p>Shoulder Extension x 10 w/ Yellow TB</p>	<p>Lat pull down with 15 lbs. – supinated grip</p> <p>Supine overhead ball bounce – 2 mins</p>

Stretching	Flexion PROM as tolerated within 90° Abduction PROM as tolerated within 90° ER as tolerated – no restrictions Joint Mobilizations Grade I-II 20 reps	Flexion PROM as tolerated within 90° Abduction PROM as tolerated within 90° ER as tolerated – no restrictions Joint Mobilizations Grade I-II 20 reps	ER Stretch at wall – turning into stretch 5 sec hold x 10 Flexion PROM as tolerated within 135° Abduction PROM as tolerated within 135° ER as tolerated – no restrictions Joint Mobilizations Grade I-II 20 reps	IR Stretch 5 sec hold x 10 Flexion PROM as tolerated –no restrictions Abduction PROM as tolerated – no restrictions ER as tolerated – no restrictions Joint Mobilizations Grade I-II 20 reps	
Manual Therapy	STM to ant/post shoulder, biceps, x 15 min	STM to ant/post shoulder, biceps, x 15 min	STM to ant/post shoulder, biceps, x 15 min	STM to ant/post shoulder, biceps, x 15 min	
Electrical Stimulation	Premodulated w/ vasopneumatic compression x 15 mins to ant/post shoulder.	Premodulated w/ vasopneumatic compression x 15 mins to ant/post shoulder.	Premodulated w/ MHP x 15 mins to ant/post shoulder.	Premodulated w/ MHP x 15 mins to ant/post shoulder.	

411 Clockwise (cw), Counterclockwise (ccw), Physioball (pb) physioball used - Physioball
 412 (SwissBall, Mission, Canada), forward (fwd), backward (bkwd), Active assisted ROM
 413 (AAROM), Repetitions (reps), with (w/), anterior (ant), posterior (post), Theraband (TB), pound
 414 (lb.), external rotation (ER), proprioceptive neuromuscular facilitation (PNF), PNF pattern used
 415 (D2).
 416

417 **Table 5. Short- & Long-Term Goals**

Short Term Goals	Long Term Goals
The patient will become independent with	The patient will be able to perform ADLs and

<p>completing her HEP within 4 weeks, including self-management techniques, in order to reduce her pain outside of the clinic and improve her ability to perform ADLs.</p>	<p>home care duties as before this injury/dysfunction after 12 weeks of physical therapy in order to increase her function.</p>
<p>The patient will improve the ROM of the affected shoulder by 10-30 degrees within 4 weeks in order to increase her functional use of the arm and decrease her pain.</p>	<p>The patient will have improved ROM to WNL for all affected areas of the shoulder after 12 weeks of PT in order to have normal movement of her shoulder post-operation.</p>
<p>The patient will improve her MMT scores by one muscle grade in order to increase her strength of the shoulder within 4 weeks of PT.</p>	<p>The patient will achieve 4+/5 MMTs of the affected shoulder motions in order to have better lifting mechanics so she is able to get back to work.</p>
	<p>The patient will be able to carry 20 lbs. after 12 weeks of PT in order to increase her function and strength so that she is able to get back to work.</p>

418 Activities of daily living (ADLs), Physical therapist/physical therapy (PT), Manual muscle
 419 testing (MMT), Range of motion (ROM), Within normal limits (WNL), Home exercise program
 420 (HEP).

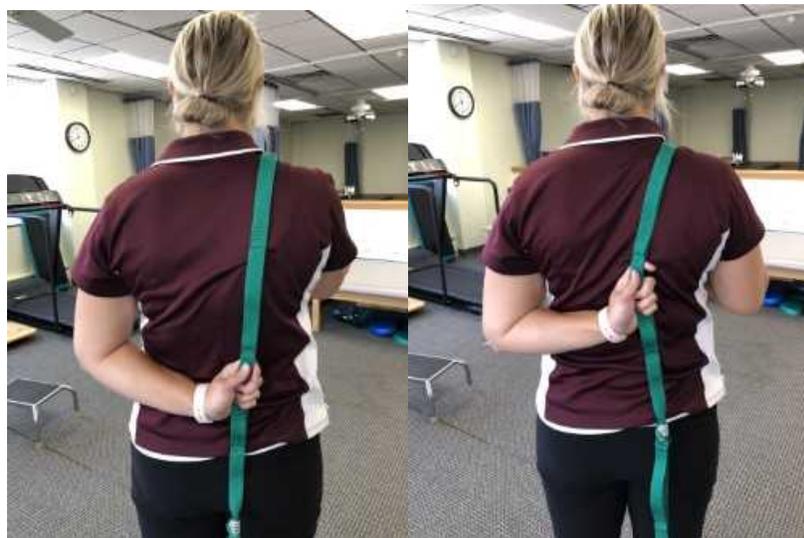
421

422 **Figure 1. Therapeutic Exercises & Manual Therapy Techniques**



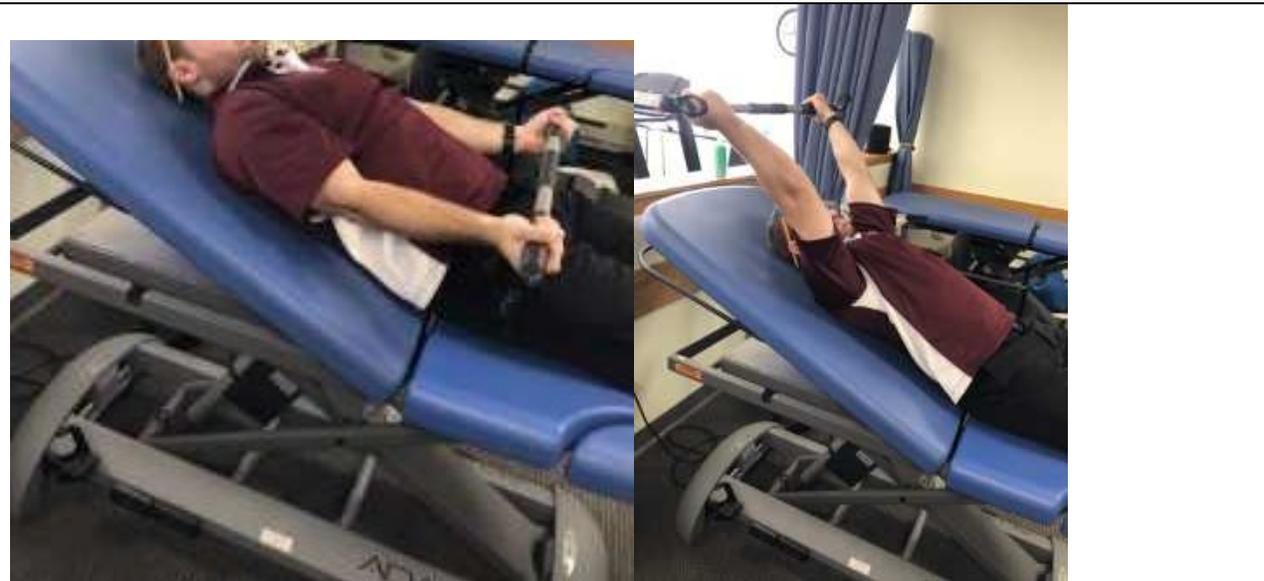
Wall Ball Circles 15 times

The patient was instructed to stand with their arm straight and roll the ball clockwise and then counterclockwise while maintaining firm contact with the ball against the wall.



Internal Rotation Stretch with Stretch Strap

The patient was instructed to place their fingers of the affected arm in the loop of the strap and pull it into a tolerable stretch with their non affected arm; holding it for five seconds 10 times.



Supine Wand Flexion 15 times with table elevated 30°.

The patient was instructed to lift the wand in the air above their head as far as they tolerably could. The table was elevated about 30° in order to gradually expose her to lifting her arm against gravity in order to maintain proper body mechanics so that the patient would not compensate by using the upper trapezius to move the arm.





Active Assisted ROM with PB – Flexion, Abduction, and Adduction 20 times.

The patient was instructed to start with her elbow bent at her side, then to straighten out her arm by rolling the ball forward, then to roll the ball to the left, then to the right, then back to the center, and then back to her elbow at her side.

Manual Therapy

Joint mobilizations performed for External Rotation specific motion – Anterior Glide of the shoulder pictured in supine and prone positions. 20 repetitions. (See Below)



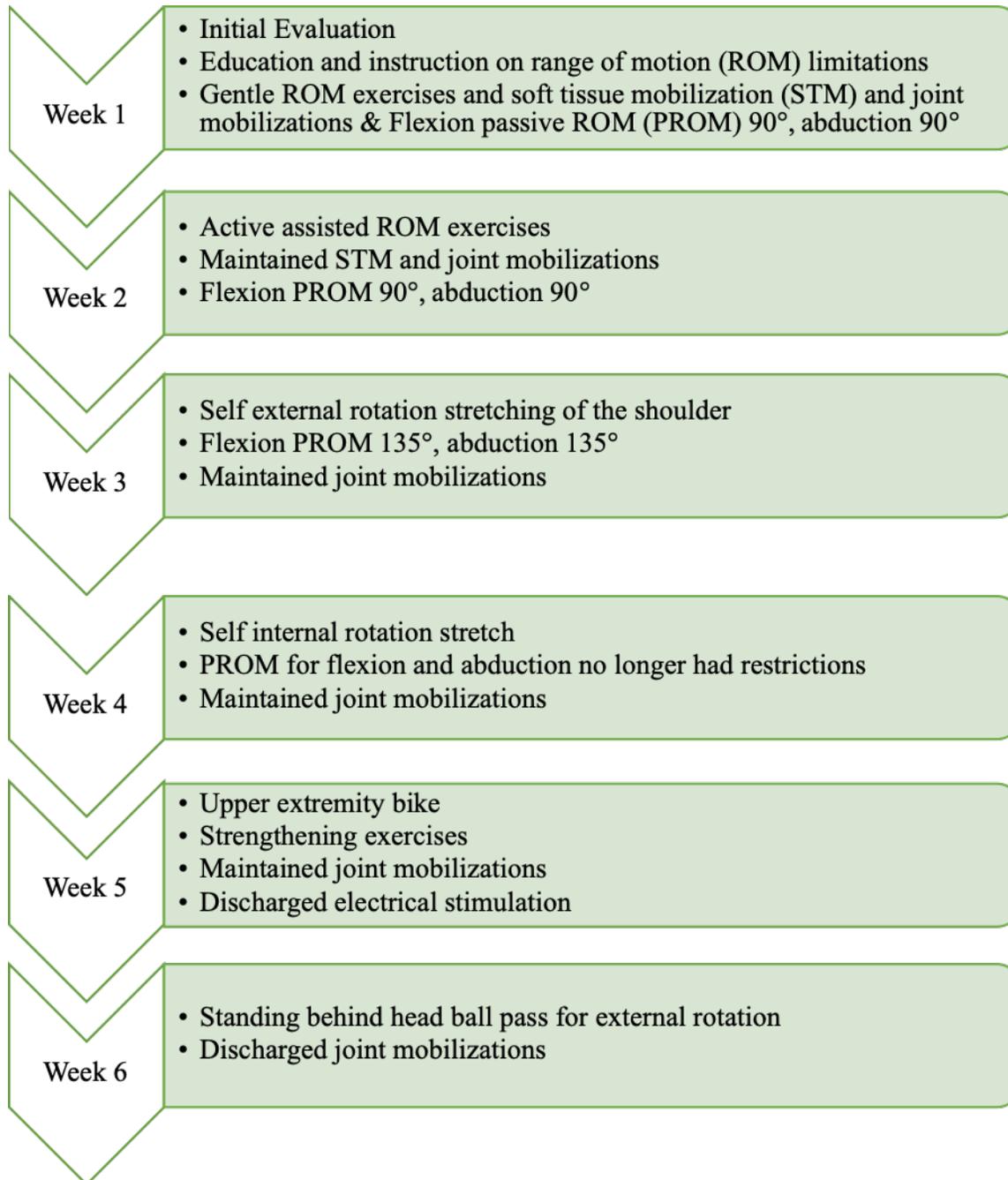
Joint mobilizations performed for Abduction specific motion – Inferior Glide of the shoulder. 20 reps. (See below)



Physioball (PB), range of motion (ROM).

423

424 **Figure 2. Timeline**



425

426

