

Conservative Care of a Patient with Initial Anterior Shoulder Dislocation Participating in an Intercollegiate Basketball: A Disablement Model Case Study

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ABSTRACT

A 23-year-old male patient participating in intercollegiate basketball, suffered an acute shoulder dislocation. The patient was diagnosed with an anterior glenohumeral labral tear and was treated with an indirect approach to increase range of motion (ROM) and function while decreasing pain. Patient-related outcome (PRO) measures were used along with clinician related outcome (CRO) measures to discharge the patient. The immediate changes in ROM and pain along with follow-up assessments of the Disabilities of the Arm, Shoulder, Hand (DASH) Scale achieved Minimal Clinically Importance Difference (MCID) levels. As rehabilitation specialists, athletic trainers have the opportunity to provide quality care to patients and recognize the repercussions of injury on the patient. The follow-up assessments support that the completed conservative indirect treatment for a patient with a glenohumeral anterior labral tear was effective at reducing pain, improving function, and improving PRO in this isolated case. The individual was able to return to basketball activities at the same level as before to the diagnosis, within a three-week timeframe. The use of Primal Reflex Release Technique (PRRT) to restore allostasis in the central nervous system was effective based on available outcomes for this patient. Then the continued re-education of pain-free functional movement patterns through Reflexive Neuromuscular Stabilization provided the patient the ability to maintain his functional gains. Clinically, considering the biopsychosocial components of injury can help guide intervention selection to provide a patient-centered model of care and ensure an optimal outcome.

Key Phrases

College and university patient population, patient-reported outcomes, therapeutic exercise

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INTRODUCTION

Anterior shoulder dislocations are the most common shoulder dislocation. The most appropriate treatment for patients following a

first-time dislocation remains unclear; surgery and rehabilitation are the two most common treatments. Patients participating in college athletics suffer shoulder dislocations at a rate of 2.58 per 10,000 exposures.¹ With 29.6% of these patients deciding to have surgery following their shoulder dislocation.¹ The rehabilitation time and return-to-play progression often last longer with patients following a surgery shoulder stabilization (6-12 weeks) compared to other nonoperative management (4-8 weeks).¹

Primal reflex release technique is a treatment paradigm that is used to evaluate and release nociceptive startle reflexes.² A clinician begins the session with a nociceptive exam to determine hypersensitive areas on the body. These nociceptive startle reflexes (NSR) could be created during a flight, fight, or freeze moment that caused the muscle to reflexively react. The muscles are then left in the hyperarousal state with increased tension in the muscle either effecting the involved area and/or another area of the body. Like the theory of regional interdependence, where seemingly unrelated area of the body may contribute or be associated with the patient's primary concern. Through a series of reflexive stimulations with manual techniques the NSR and central nervous system (CNS) can be downregulated to restore an allostasis state in the area.²

Currently, the literature on conservative treatment versus surgical intervention does not provide one optimal evidence-based practice.^{3,4} This case study shares a scenario where a neurophysiological intervention was utilized. The treatment plan successfully restored the patient's perceived function as well as improve quality of life and alleviated pain.

PATIENT INFORMATION

The patient in this case is a 23-year-old male collegiate basketball player. The patient suffered a right shoulder dislocation two weeks before returning to campus for preseason workouts. The mechanism of injury was a posterior to anterior force by an opposing player while reaching to intercept a pass. Following a trip to the emergency department, the physicians sedated the patient to relocate his glenohumeral joint. Upon arrival to the Athletic Training Clinic, the patient was still using the sling and was very apprehensive. Initial evaluation supported the diagnosis of sub-acute right anterior shoulder dislocation with limited range of motion and strength in all shoulder motions. Stress tests included a positive empty can, O'Brien's Test, Apprehension Test, and Load and Shift Test; the Yergerson's Test and Speed's Test were negative.

During the previous season, the patient did not participate fully in games as he was recovering from a complication during surgery. The complication left him with shortness of breath and difficulty catching his breath during strenuous exercise. Through the year and a half, following this event, the patient worked with breathing exercises and neurological resets to retrain his breathing and autonomic nervous system to prepare for strenuous exercise. The strategies the patient learned from the previous interventions could have assisted in the current recovery from the anterior shoulder dislocation. This example of how the patient-centered care for this patient may have led to the most optimal outcome.

Differential Diagnosis and Evaluation

The patient was not on campus or in the state at the time of the incident. The Emergency Department Physician who first evaluated the patient reported no fractures were present based on the x-ray images. The treating clinician evaluated the patient six days after the dislocation upon his return to the clinic. Following the evaluation by the treating clinician the patient

was referred to the team physician. The team physician reported similar instability findings and ordered an MRI arthrogram to rule out anterior labrum tear. Based on the MRI arthrogram, the patient sustained an anterior labrum tear with a Hill-Sachs lesion to the humeral head.

Based on the size and shape of the labrum tear, the team physician recommended rest and gradual return-to-play. The patient expressed an interest in continuing to play as long as he was able. The differential diagnosis included fracture, contusion, biceps tendon rupture, and rotator cuff strain/ tear. The patient supported the two-week conservative treatment plan, to determine if function could be improved. The next day, the patient began an intervention program designed to restore the balance of his CNS.

Body Structure and Function

Due to the nature of injury, onset, time to the season, and the finding from physical examination and the MRI arthrogram; it was determined that the patient could attempt conservative interventions to manage his shoulder pain and lack of function. Based on the tissue healing timeframes for the structural damage to the cartilage, evident on MRI, the plan of care was directed at restoring function through balancing the CNS with no expectation of tissue healing. Subsequently, a secondary evaluation was completed to assess the patient perception on his ability to perform functional and basketball activities. The Patient Specific Functional Scale (PSFS) and DASH were completed (**Table 1**). The patient report zero function in his ability to 'dunk,' 'shoot,' 'dribble,' and 'complete one pushup.' He did report raising his arm 'arm raise' as a three out of ten on a functional scale. Along with the DASH, the DASH Sport sub-scale was also completed (Table 1). The patient recognized the scores that he entered on the DASH Sport sub-section were low and that he needed substantial improvements before he would play basketball at his desired level.

Activity and Participation

To gather an outcome for the patient's health-related quality of life the Disablement in the Physically Active Scale (DPAS) was completed. The starting point for this DPAS was higher than previous measures demonstrating that his health-related quality of life had improved from the first condition that sidelined him for more than a year. In his current state, the DPAS was scored at 39. In the wellness section, a meaningful finding was the perceived lack of support from teammates. This finding served as one of the biopsychosocial components of injury that helped guide the intervention selection.

Environmental and Personal Factors

The patient dealt with a significant transition period of his life while recovering from this injury. After two years of playing college basketball as the son of the head coach, he was preparing to be on a team with a new head coach. Before the injury, the patient was concerned about being able to play for the new coach. His environment and personal relationships were shifting while he was trying to comprehend his college basketball career.

INTERVENTIONS

The first intervention was PRRT. It was selected to down-regulate the nervous system to restore allostasis in the CNS of the patient. The reflexive muscle inhibition and innervation techniques were applied over two treatments. Once the patient had decreased NSR and movement began to return, Reflexive Neuromuscular Stabilization was provided. The arm raise was the movement that was addressed. Three treatments of the PRRT and RNS were performed with the patient on the first three treatment days. Then the next two treatment days were focused on upper extremity neuromuscular stabilization exercises progressing from a closed-chain position to an open-chain position. The exercises focused on the areas of function that the patient expressed were lacking in the PSFS. During these treatment sessions, visualization, biofeedback, and acupressure were

used to help restore the patient's trust and confidence in his shoulder.

OUTCOMES

Body Structure and Function

After the initial treatment of PRRT (**Figure 1**) the patient had improved shoulder abduction. These improvements were maintained to the next day (**Figure 2**) then further improvements occurred following the second PRRT treatment paired with RNS (**Figure 3**). Pain decreased to zero when at rest and two when it was the worst. Over the time of three treatments the patient experienced an increase of 6.3 for the average of the PSFS scores, which meets the MCID (**Table 1**).

Activity and Participation

Upon return to full unrestricted basketball-related activities, 13 days following the beginning of the initial intervention, the patient had verbalized that he was enjoying playing basketball and had a good balance with the rest of his life. The DPAS score at that time was 5, which was a MCID, from the initial score (**Table 1**). His focus had shifted from "can I play, or should I play with my shoulder injury" to "I want to play" and "I will control my focus and energy every day." The patient reported increased support from his teammates and family during this time.

Environmental and Personal Factors

After two weeks of completing unrestricted basketball related activities the patient began to reconsider his position on the team and the challenges of play under a new coach. He decided it was in his best interest to transfer to another college to continue his basketball career. After this decision was made, he did not complete any on-court basketball-related activities but remained physically active during weightlifting and conditioning sessions with the team. The patient continued to complete upper extremity neuromuscular stabilization exercises in the athletic training clinic as needed.

DISCUSSION

This case describes the diagnosis and management of an intercollegiate basketball player following anterior shoulder dislocation and subsequent glenoid labrum tear with Hill-Sach Lesion treated with neurophysiology interventions to decrease pain, improve function, and return to full unrestricted basketball activity. The interventions used in this case study have been used with similar patients, with lower extremity dysfunction.⁵ The physicians involved in this case were prepared to surgically repair the patient's shoulder, if the two weeks of conservative care did not improve the patient's outcomes. Researchers are divided on the standard of care for patients with first-time shoulder dislocations. In this case, the innovative treatment plan benefited the patient and assisted the patient in reaching his goals without surgery.

To confidently return the patient to unrestricted basketball-related activities, the medical team assessed the patient's objective measurements (stress tests, range of motion, strength tests, functional capabilities, etc.) along with the PRO scores (perceived function, pain scores, perceived difficulty in ADLs and basketball). Utilizing these outcomes as a formal metric is valuable in the communication to stakeholders (patient, physicians, coaches, etc.). Also, tracking these scores can further objectify the return-to-play protocol. These outcome measures have been used in other disablement case studies to determine the best treatment plan for a patient.⁶

CLINICAL BOTTOM LINE

Athletic Trainers often take on the role of care provider from the "teams" and patients they work with. A portion of the care in this case study was rooted in psychological wellness. As the Athletic Training Education continues to evolve and includes more courses on treating the bio-



Figure 3. Shoulder Abduction Post Initial Intervention



Figure 3. Shoulder Abduction One Day Post Intervention



Figure 3. Shoulder Abduction After Second Intervention

Table 1. Patient-Oriented Outcome Scores

	Initial	Second Treatment	Third Treatment	Fourth Treatment	Discharge	Two Week Follow-Up
Outcome		2 Days	4 Days	9 Days	13 Days	
NRS WB	1	2	0	0	1	0
NRS NWB	1	2	0	2	0	0
NRS Best	1	2	0	0	0	0
NRS Worst	3	3	2	5	2	0
PSFS Total	0.5	2.3	6.8*	7.3	9	9.6
PSFS Arm Raise	3	6*	8	8	9	10
PSFS Carrying Bag	0	8	9	10*	10	10
PSFS Dunking	0	0	8	4	8	9.5
PSFS Shooting	0	0	5	6	8*	10
PSFS Dribbling	0	0	7	9	10*	8
PSFS Pushup	0	0	4	7*	9	10
DASH	45	39.4	N/A	33*	17.7	3.8
DASH Sport	20	20	N/A	15	12	5*
OMNE (TPs)	10	6	6	2	5	2
DPAS	39	N/A	N/A	N/A	5*	12
GROc	4	5	N/A	2	3	6

NRS WB= Numeric Pain Rating Scale in weight-bearing; NRS NWB= Numeric Pain Rating Scale in non-weight-bearing; NRS Best= Lowest score throughout 24 hour period; NRS Worst= Highest score throughout 24 hour period; PSFS Total: Average of Patient-Specific Functional Scale items for that session; PSFS Arm Raise, Carrying Bag, Dunking, Shooting, Dribbling, Push-up: Specific item selected and scored by the patient as part of the PSFS; DASH: Disabilities of the Arm, Shoulder, and Hand Scale; DASH Sport: Sport sub-scale; OMNE (TPs)= One-Minute Nociceptive Exam assessing number of Tender Points; DPAS: Disablement in the Physically Active Scale; GROc: Global Rating of Change Scale; MCID=*

psychosocial component of an injured patient, it will be customary for clinicians to explore physical interventions that can assist with the traditional bio-psychosocial interventions. In this case, the use of PRRT helped down-regulate, “calm” the patient’s CNS to improve his pain, function, and PRO scores. Athletic Trainers are competent in recognizing how biopsychosocial elements related to injury can navigate patient-centered care and intervention strategies that ensure an optimal outcome.

PATIENT PERSPECTIVE

“As it relates to my shoulder injury specifically, I really saw improvements after every training session. It all happened fast, and some would say my return to basketball was too fast. The results were undeniable, and they allowed me to play even due to my unusual speedy recovery.

I know exactly why I got better. I got better due to the revelation of the connection your essence has between the mind, body and soul that my Athletic Trainer very clearly explained to me. My Athletic Trainer did a phenomenal job of giving me information and communicating the same message in multiple different ways. I am a devout Christian. With that being said, he was able to give me the biblical perspective to my health pertaining to my situation while also saying the same exact thing behind a physical training lens and then tying it all together with science, data, and fact. So many different lenses and perspectives that he used to tie everything together for the same message. He then showed me very clearly how all of these things are connected and similar along with how these elements tie into one another.”

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