
The Use of Occupation-Based Treatment With a Person Who Has Shoulder Adhesive Capsulitis: A Case Report

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This article describes a case report of the occupational therapy management of a 53-year-old woman diagnosed with primary shoulder adhesive capsulitis. The occupation-based interventions are described through the framework of occupation-as-means. Compensatory occupation, preparatory methods, and purposeful activities are demonstrated as being critical to minimizing connective tissue deformation associated with this condition. This case report indicates that occupation-based intervention should be initiated as soon as a diagnosis is identified to prevent the downward spiral of forced disuse associated with the affected upper extremity. As illustrated by the case report, occupation-based treatment that was provided in a timely manner immediately decreased pain, improved range and quality of motion, and enhanced occupational performance.

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Numerous approaches to treating a person with shoulder adhesive capsulitis (SAC) have been described in the literature (Kaltenborn, 1980; Light, Nuzik, Personius, & Barstrom, 1984; McClure & Flowers, 1992; Neviaser & Neviaser, 1987; Vermeulen et al., 2000), yet no studies have been identified that suggest the best practice for physical rehabilitative measures (McClure & Flowers, 1992). Many therapeutic approaches that have been used to treat a person with SAC include manual therapy, electrical modalities, active exercises, and various basic and advanced joint mobilization techniques (Kaltenborn, 1980; Light et al., 1984; McClure & Flowers, 1992; Neviaser & Neviaser, 1987; Vermeulen et al., 2000). Relative to modifying occupational roles and using compensatory approaches as a result of an acquired physical impairment, a plethora of material is addressed within occupational therapy and physical therapy professional resources. However, in review of the occupational therapy literature, there were no identified studies specifically involving SAC, and only minimal other studies related to orthopedic hand conditions supporting occupation-based intervention as an effective and significant tool within a person's rehabilitative process (Amini, 2004; Chan & Spencer, 2004; Nelson & Peterson, 1989; Rice, Leonard, & Carter, 1998). The literature contains support for the use of occupation-embedded intervention relative to neurologically associated motor control impairment involving the upper extremity (Nelson et al., 1996; Trombly & Cole, 1979; Trombly & Ma, 2000; Trombly & Quintana, 1983; Trombly & Wu, 1999; Wu, Trombly, Lin, & Tickle-Degen, 1998). This article will present the case report of a person with primary or idiopathic SAC and the role of occupational therapy intervention. A case report refers to a description of how one case was managed and the resultant outcomes. Case reports, as a methodology, reflect actual patient situations and provide a context for learning about occupational therapy care issues (Creswell, 1998; McEwen, 1996). The purpose of this case report is to illustrate how one person experienced and managed SAC with the assistance of occupational therapy. The woman in this case report was selected because she was willing to participate over a long period of time and represented many of the classic symptoms of SAC. Field reports were collected by the treating occupational therapist during intervention. The client

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journalized experiences while completing home programming interventions.

This case report is a good addition to the literature because it illustrates an occupation-based treatment perspective of SAC. No other case reports regarding occupational therapy issues with SAC could be found in the literature. Physicians are more frequently referring upper-extremity cases to occupational therapists during the acute phases of disability. Some insurance companies are mandating the most efficient and cost-effective mode of physical rehabilitation, increasing the use of occupational therapy services. Consequently, many occupational therapists are finding themselves in clinical roles whereby treating the shoulder is becoming more commonplace.

SAC involves inflammation of the glenohumeral joint capsule. Abnormal bands of tissue (e.g., adhesions) grow between the joint surfaces, creating contractures and restricting movement in all planes of motion. There is also a lack of synovial fluid, which normally lubricates the joint space between the humeral head and the glenoid fossa. It is this restricted space between the fossa and the proximal humerus that distinguishes primary SAC from a less complicated painful, stiff shoulder (Binder, 1984).

SAC usually occurs in persons older than 40 years of age (Chase, Frieman, & Fenlin, 2002; Gazielly, Gleyze, & Montagnon, 1994; Lundberg, 1959). Although not directly supported by the literature, most shoulder specialists familiar with SAC believe that women are more commonly affected than men (Chase et al., 2002). Furthermore, the cause of primary SAC is not known; however, several predisposing factors have been identified. There is an increased risk for this condition in clients with insulin-dependent diabetes mellitus, degenerative disc disease of the cervical spine, hyperthyroidism, and ischemic heart disease (Bridgeman, 1972; Lesquesue, 1977; Neviaser & Neviaser, 1987).

Studies suggest that the course of primary SAC has three distinct phases. The first phase begins with an insidious onset of diffuse pain. Clients often report a dull ache that becomes worse. Traditional and contemporary research describes this “freezing” stage as lasting up to 3 months (Neviaser, 1983; Reeves, 1975). The client gradually uses the extremity less and less and starts to lose motion. This phase is associated with an erythematous, hypervascular synovitis, seen histologically in acute inflammatory synovitis (Chase et al., 2002). Studies suggest that the second phase, lasting between 4 to 6 months from onset (Neviaser, 1983; Reeves, 1975), occurs when the shoulder begins to become stiff. Loss of motion and occupational performance deficits mark this stage, often referred to as the “frozen” stage. A dull and aching pain continues, and severe pain is often experienced with movement. Histologically, there is

hypervascular proliferative arthritis and capsular fibrosis (Chase et al., 2002). The third stage is marked by “thawing,” during which the person regains lost motion. The research points out that this stage occurs between 7 and 9 months from onset (Neviaser, 1983; Reeves, 1975). An improvement is seen in occupational performance due to improved joint motion and lessening discomfort. The capsule does become very scarred, thick, fibrotic, and hypovascular, despite clinical improvement (Chase et al., 2002).

Overall, because this condition is often self-limiting, the outcome for most persons is favorable, even without therapeutic intervention (Center for Orthopedics & Sports Medicine [COSM], 1999; Lamm, 1994). On the other hand, contrary to popular opinion, Davis (1991) stated that within his chiropractic practice, he has seen a limited number of complete recoveries from this clinical entity, and residual disability or limitation in motion is common. There are conflicting viewpoints as to when treatment should begin. The period during which therapy is most warranted is during the final “thawing phase,” which immediately follows the intermediate “frozen phase,” usually 6 months after the initial problem starts (COSM, 1999; Lamm, 1994). However, Coopee (2003) and Davis (1991) stated that, initiated early in the treatment process, proper treatment focused on avoidance of progression of the lesion remains the best regimen. This case report will illustrate that early intervention is extremely critical with the initial onset of SAC due to the acute pain that creates a forced disuse pattern of the affected upper extremity. DiLorenzo (1999) stated that pain creates a disincentive to move the arm and, consequently, the lack of movement causes the joint and muscles to tighten. The loss of mobility and tissue elasticity causes more pain, the pain causes less motion, and hence a downward spiral begins, leading to a chronic problem (DiLorenzo, 1999, p. 62). The response to this downward spiral of chronic dysfunction and subsequent limitations in occupational performance is a comprehensive occupation-centered intervention approach. This article addresses occupational therapy intervention using Trombly’s (1995) focus on occupation-as-means as the framework for occupation-based intervention.

Occupation-as-Means

When a specific occupation, determined by the client’s choice or interests, is used as a means in therapy to bring about change in a person’s performance, Trombly (1995) refers to this as *occupation-as-means*, or purposeful activity. Furthermore, an activity is purposeful if the person is an active, voluntary participant and if the activity is directed toward a goal that the person considers meaningful

(American Occupational Therapy Association [AOTA], 1993). As cited in Hinojosa, Kramer, Royeen, and Luebben (2003), the success of the occupation-as-means is entirely dependent on the meaningfulness or subjective value of the occupation to the individual (Primeau & Ferguson, 1999). Nelson (1997) parallels this by stating that any occupational form that has perceived meaning to the individual will have an influence on his or her purpose or goal, and subsequently occupational performance will be enhanced. Within the context of SAC and the therapeutic continuum, occupation-as-means includes the use of preparatory methods and purposeful activity. Preparatory methods (AOTA, 2002), such as therapeutic ultrasound for heat and manual stretching for range of motion, are precursors to the person's active involvement in purposeful activities (AOTA, 2002) involving self-stretching and structured tasks, such as Pilates and reaching to write on a chalkboard, to facilitate active range of motion and function.

Compensatory occupation is another intervention within the occupation-as-means continuum. Nelson (1997) described compensatory occupation as compensatory training that is matched carefully to the person's developmental structure, thus facilitating positive adaptation to an identified condition, such as SAC. The uniqueness of this initial approach provides the client with insight into the phenomena of "forced disuse" (Gallew, 2005) and helps to facilitate mastery relative to the individual's management of this condition. When an occupational therapist first consults with a person with SAC, the concept of compensatory occupation can be immediately applied in helping the client adapt to his or her functional limitations. Because of the condition's effect on occupational role performance, the occupational therapist facilitates a meaningful educational process of determining what occupations the client should refrain from or, at the very least, of discussing compensatory approaches to those occupations. Additionally, the clinician may assist

the client in developing new, yet temporary, occupational patterns as they relate to the initial adaptation to SAC.

The continued performance of structured daily activities or tasks in which the person participates is also emphasized within the context of SAC and this framework. This "means-to-an-end" intervention dramatically facilitates the carryover of biomechanical and functional gains acquired in the clinic setting through participation in planned purposeful activities using home programming. This comprehensive approach discourages the forced disuse pattern and enhances the rate and carryover of creep or tissue elongation or deformation in connective tissues, through the ongoing active stretching associated with the involved extremity during daily activities (Bridges & Jensen, 1999; Norkin & Levangie, 1992) (see Table 1).

Case Study

History. A basically healthy 53-year-old Caucasian female university professor experienced an insidious onset of pain and stiffness in her nondominant left shoulder and, approximately 3 weeks from the onset, was diagnosed with primary shoulder adhesive capsulitis. Her medical history was unremarkable except that she had recently been diagnosed with hypothyroidism. She had no other known risk factors (diabetes, degenerative disc disease, ischemic heart disease, or other) for SAC. Her physician advised her to take a non-steroidal anti-inflammatory medication, but did not initially recommend that she begin a therapy regime. Shortly after her formal diagnosis, she obtained her physician's consent for occupational therapy intervention.

Occupational evaluation. The initial occupational therapy evaluation began approximately 4 weeks post onset. Primary complaints included left shoulder stiffness and upper quadrant pain at rest, but especially with movement. She stated she had significantly reduced the use of her left

Table 1. Occupational Therapy Intervention

Framework	Definition	Examples of Intervention
Occupation-as-Means	Using interventions that are meaningful (perceived, affective, symbolic) to the client during the intervention process (Nelson, 1997; Trombly, 1995)	<ol style="list-style-type: none"> 1. Compensatory Occupation, such as assisting the client to accept functional limitations so adaptation can occur. <ul style="list-style-type: none"> • Discontinuation of weight-lifting program during the acute phase of SAC • Reinforcement of healthy patterns, such as completing activities of daily living • Education regarding forced disuse and fear avoidance 2. Preparatory Methods <ul style="list-style-type: none"> • Therapeutic ultrasound • Active and passive range of motion 3. Purposeful Activities <ul style="list-style-type: none"> • Rote stretches via something enjoyed by the client; Pilates • Encouraging the client to put away dishes from the dishwasher into the upper shelves to stretch the affected upper extremity.

Note. SAC = shoulder adhesive capsulitis.

upper extremity with her daily activities “for fear that I might injure it further and because of the pain.” Her goal was to decrease her pain and to resume her daily activities without compensatory means. She noted that she stopped her leisure pursuits of kayaking and a 3-day-a-week fitness routine of upper-body and lower-body strengthening and conditioning. The client was particularly distressed with her inability to perform some of the critical demands involved within her teaching role, especially teaching psychomotor skills to nursing students. Many of her daily activities were affected, including washing her hair, managing the collar of her blouse, fastening her bra, tucking in her shirt, pulling up her slacks, and donning a belt.

Range-of-motion testing revealed that her left shoulder motions were limited actively and passively in all anatomical planes by a firm capsular end-feel (see Table 2). Left scapular motion was affected for upward rotation and protraction with palpable scapular winging. Right nonaffected shoulder and scapular motion was normal. Functional range of motion was noted from the left and right elbow distally, and strength testing was not completed. Pain was noted especially at end ranges of motion and during rest and sedentary activity. The discomfort was limited to the anterolateral shoulder with radiating pain into the area of the deltoid insertion. The client rated her pain level as “intense,” citing 8/10 on the Numerical Pain Intensity Scale (Jensen et al., 1994).

Intervention and outcomes. To begin the process, the topic of compensatory occupation was discussed. The client was advised to continue using her left upper extremity with her customary activities of daily living (ADL) and her instrumental ADL as tolerated. As she became educated on her condition, this initial critical step helped the client deal with her fear avoidance (Pincus, 2004) in that she began to use her affected left upper extremity without the perceived fear of further injuring her shoulder. She was encouraged to continue with the traditional demands of her job. She was able to acquire insights as to why she “has bad days (pain) with the shoulder.” Her conclusion at one point was that she realized that continuous keyboarding with her upper

extremities in a static position often exacerbated her condition. Therefore, she began to pace herself and effectively typed in shorter time intervals.

As she continued her ADL and dealt with her fears about exacerbating the condition, she was able to resume her role of facilitating nursing practicums, for which she was primarily responsible. Significant discussion also focused on her leisure pursuits. She voluntarily noted that because the summer season had ended, eliminating the need to kayak was easy. Dialogue with the client focused on her fitness and wellness routine that involved upper-body and lower-body strengthening and conditioning. She was also active in yoga. The client’s concern was for her perceived loss of her physical conditioning, which she highly valued. She also noted a deep concern for her weight gain due to her decrease in physical activity. The client gradually modified the occupational roles that were still meaningful to her. She eliminated kayaking and yoga because of the pain and limitations associated with these occupations, but channeled her interests into recumbent bicycling. Although she did not formerly mow her lawn, she assumed this role from her husband in an effort to remain physically active. When asked about the effects of the lawnmower’s vibrations, she stated that there were no adverse consequences.

Preparatory methods were used to initiate the therapist-driven occupation-as-means process. Therapeutic ultrasound implemented for 5 min at 1.2 w/cms, 1MB to the anterior glenohumeral joint, was used to deliver deep heat to the shoulder capsular structures. Passive stretching was completed to all anatomical motions of the shoulder. Lehman (1982) reported that less force is required after heat application to mobilize tissues either actively or passively, thereby maximizing client safety and comfort. Norkin and Levangie (1992) found that in conjunction with stress to soft tissue, tissue temperature affected the rate of *creep*, or extensibility, in connective tissue. Greenburg (1972) stated that heat can be used to “jump start” motion. He found that heat and activity combined increased local blood flow to three times greater than just heat or activity alone.

Table 2. Shoulder Active Range of Motion (AROM)

	Initial Evaluation Freezing Stage		6 Weeks		6 Months Frozen Stage		9 Months Thawing Stage	
	Left	Right	Left	Right	Left	Right	Left	Right
Flexion	85°	165°	140°	165°	160°	165°	163°	165°
Extension	45°	63°	60°	63°	60°	63°	64°	63°
Abduction	70°	172°	90°	172°	135°	172°	166°	172°
Horizontal Abduction	60°	91°	90°	91°	90°	91°	90°	91°
Horizontal Adduction	15°	44°	45°	44°	45°	44°	45°	44°
Internal Rotation	10°	66°	25°	66°	50°	66°	65°	66°
External Rotation	10°	84°	40°	84°	64°	84°	81°	84°
Pain Rating	8/10		3–4/10		1–2/10		0/10	

Note. Non-affected right-upper-extremity AROM measured only during initial occupational evaluation.

Active intervention involving additional preparatory methods and purposeful activity subsequently commenced, which further fortified the occupation-as-means approach. The client was taught a home program regime consisting of rote self-stretching, active assisted, and active range-of-motion exercises to all anatomical glenohumeral joint planes and to scapular protraction and upward rotation. After completing these exercises, the client participated in various interventions, including active mobilization procedures, in an effort to improve her range of motion and decrease her pain. The client was experiencing immediate results of improved motion and, therefore, she frequently reported this process as being very meaningful. She perceived a rewarding purpose to this regimen and subsequently maintained a high degree of motivation and maintained self-directed efforts in managing this condition. Purposeful activity included functional tasks to facilitate active motion of the affected left upper extremity in all planes of motion. A large pegboard placed at bench height provided various positions of horizontal reaching; a self-gripping checker game afforded the client various levels of functional vertical reaching and rotational opportunities of the extremity; and a hula hoop stand set the stage for functional internal and external rotational motion.

Six weeks after the initiation of occupational therapy at twice per week, formal reassessment revealed active range of motion in left shoulder improving (see Table 2). The client rated her pain level as "minimal to moderate," citing a 3-4/10 (formerly "intense," 8/10) on the Numerical Pain Intensity Scale (Jensen et al., 1994). Qualitatively, the client reported, "I have greater ease of movement; I was taking [an ibuprofen product] every 6 hours, now I don't take it at all; I am consistently better at placing my hand behind my back with less pain." She also stated that occupations such as washing her hair, managing the collar of her blouse, tucking in her shirt, pulling up her slacks, and donning a belt were improving.

However, a visit to an orthopedic surgeon led to considerable uneasiness for the client. The surgeon, who was unhappy with her progress, wanted to manipulate the shoulder under anesthesia and then order intensive physical therapy follow-up at 4 to 5 days per week, to try to hasten the recovery process. Whether to proceed with occupational therapy or begin the recommended intervention was a difficult decision for the client. Because the holidays were coming and the client was leaving for vacation, she decided not to make any changes in her treatment for the months of December and January. During this period, only the home occupational therapy program was continued and positive progress was made, so surgical manipulation was never pursued.

Finally, because of continued occupational therapy and excellent compliance of the patient with home program follow-through, results were dramatically positive. Six-month and 9-month reassessments were completed, rendering progressively favorable results using only a home program regimen (see Table 2). The client continued to participate in her daily roles, making an ongoing conscious effort to use her affected arm during her daily occupations. She would reach overhead when she needed to use the projector screen and, in her office, would strategically place her body in a position that challenged her to toss refuse into her trash can while abducting and rotating her shoulder. The client would reach across her body with her left upper extremity when answering her office telephone, and would reach vertically and away from her body to place items to be filed into a compartment. While washing dishes at home, the client would place the dishes in their respective spot on the upper shelf of the cupboard to stretch the upper extremity; and while teaching, she would reach as high as possible to the top of the chalkboard to write information concerning her class (see Table 1). Virtually with every daily activity and subsequent demand, the client forced and challenged herself to use her affected upper extremity in all planes of motion and as much as possible, at end ranges of shoulder flexion, abduction, horizontal adduction and abduction, internal rotation, and external rotation. The client eventually regained nearly full active range of motion in every anatomical plane.

Discussion

Using the framework of occupation-as-means, a client was assisted to manage the pain and disability associated with SAC and to overcome the negative effects of learned disuse and fear avoidance. The interventions demonstrated included compensatory occupation techniques, preparatory methods, and purposeful activities. The client was engaged as an active participant throughout the treatment process and learned insights and techniques to alter her daily activities, interests, and routines to maximize occupational performance and minimize pain and disuse.

This case report confirmed that continued use of the affected upper extremity outside of the therapeutic milieu was critical to the maximization of connective tissue gains acquired in therapy. Brand (1984) noted that any elongation of tissue accomplished in therapy will shorten again once the force is relaxed. Therefore, the increase in tissue length and subsequent improvements in motion produced by short-term occupation-as-means intervention serves only to temporarily deform the tissue rather than to produce a permanent length change (McClure & Flowers, 1992).

Although this temporary elongation may be useful, permanent tissue elongation is probably accomplished through the process of continuing to do one's daily tasks using a structured home program.

Because SAC often causes substantial pain and frustration for the client, rehabilitative therapies must be offered as soon as the diagnosis is formally made, most preferably during the first stage of onset. The overall findings in this case were such that after 6 months of biweekly treatment, the client had progressed significantly with her active motion, and her daily activities, including work and leisure pursuits, were unrestricted. After another 3 months of continuing with only her home program, another formal reassessment was completed (9 months after the initiation of occupational therapy); and the client had nearly regained all active left shoulder and scapular movement (see Table 2).

As with any case report, our intent is not to generalize to other persons but to provide a rich description of SAC to inform practice. One limitation of this study is that other explanations for the outcomes of this case could have been possible. For example, SAC is self-limiting and it could be argued that the outcomes of this case report could have been realized without any occupational therapy intervention. Also, at about 9 months post onset of SAC, the client traveled to a tropical climate for about 3 weeks, which may have altered the condition's course. Furthermore, this case report is based on only one person; therefore, the external validity is limited. One needs to be prudent about generalizing the sequence of the occupation-based intervention, as portrayed in this case report, to other persons.

Conclusion

The authors have discussed the occupation-based management of a person with primary SAC. Treatment was based on research, clinical experience, applying theoretical frameworks, and having a sound understanding of the arthrokinematics of primary SAC. Despite the purported research (COSM, 1999; Lamm, 1994) that supports treatment as being most effective during the final phase of this condition, we believe that intervention should be initiated as soon as a diagnosis is identified to prevent the downward spiral of learned disuse associated with the affected upper extremity. Occupation-based treatment should also be immediately provided to decrease pain and improve on the rapid onset of a person's occupational performance deficits. As evident by this case report, after just 6 weeks of occupation-based intervention (10 weeks post onset of the condition), an appreciable reduction in pain was noted and a significant improvement was evident in functional shoulder active range of motion and quality of movement that

notably enhanced occupational performance. Occupation-based treatment also helped this client avoid surgical manipulation and intensive physical therapy. Occupational therapy afforded a cost-effective means of treating SAC with minimal interruption of the client's home and professional life. ▲

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