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RAPID FUNCTIONAL RECOVERY IN A DIABETIC POSTMENOPAUSAL WOMAN WITH FROZEN SHOULDER THROUGH SPENCER MOBILIZATION TECHNIQUE: A CASE REPORT

Case Report

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ABSTRACT

Background: Frozen shoulder, or adhesive capsulitis, is a debilitating condition characterized by progressive shoulder pain and restricted motion, commonly seen in women aged 40 to 70 and those with diabetes mellitus. While conservative treatments such as analgesics, corticosteroid injections, and physiotherapy are standard, manual therapy approaches like the Spencer Mobilization Technique have shown emerging promise. However, there is limited evidence of their effectiveness in diabetic postmenopausal women—a group often facing prolonged recovery due to hormonal and metabolic influences.

Case Presentation: A 55-year-old postmenopausal homemaker with type 2 diabetes and hypertension presented with an 8–10month history of worsening right shoulder pain, stiffness, and limited function, notably struggling with overhead activities like combing her hair. Physical examination revealed muscular tightness, diffuse anterolateral tenderness, and significant restriction in active and passive shoulder movements.

Intervention and Outcome: The patient underwent a five-week physiotherapy protocol combining electrotherapy and the seven-step Spencer Mobilization Technique, aimed at restoring joint mobility. Treatment led to marked improvements in pain, range of motion, and the ability to perform daily activities. SPADI and VAS scores showed progressive reduction, and shoulder function was significantly restored without any complications.

Conclusion: This case supports the clinical utility of the Spencer Mobilization Technique as an effective, non-invasive intervention for managing chronic adhesive capsulitis in diabetic postmenopausal women. Its integration with electrotherapy and patient education may facilitate faster recovery and functional independence in high-risk populations.

Keywords: Frozen shoulder, Spencer mobilization technique, physiotherapy intervention, postmenopausal women, diabetes mellitus.

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INTRODUCTION

Adhesive capsulitis, more commonly referred to as frozen shoulder, is a debilitating musculoskeletal condition that presents progressive pain and restriction in the range of motion of the glenohumeral joint. Affecting primarily individuals between the ages of 40 and 70, the condition is notably more prevalent among women. A particularly striking observation is the strong association between adhesive capsulitis and diabetes mellitus, with studies indicating a prevalence rate of approximately 13.4% among diabetic individuals— significantly higher than in the general population, suggesting a metabolic contribution to its pathogenesis (1,2). The etiopathogenesis involves chronic inflammation of the joint capsule and synovium, ultimately leading to capsular fibrosis and adhesions that restrict joint mobility. Clinically, the condition progresses through three stages: the initial "freezing" stage marked by escalating pain and partial loss of motion; the "frozen" stage characterized by pronounced stiffness and reduced pain; and the "thawing" phase, where gradual recovery in range of motion occurs as inflammation subsides (3,4). Standard management approaches for frozen shoulder encompass a combination of pharmacological and non-pharmacological therapies. Non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroid injections, and structured physiotherapy regimens remain the cornerstone of conservative treatment. However, in many cases, particularly in patients with comorbidities such as diabetes, the course of recovery tends to be protracted and incomplete, with some individuals experiencing residual functional limitations. This has led clinicians and researchers alike to explore adjunctive or alternative therapies that may accelerate recovery or improve long-term outcomes. Among such modalities, manual therapy techniques have received increasing attention, particularly those rooted in osteopathic and physiotherapeutic principles (5).

The Spencer Mobilization Technique, an osteopathic manipulative treatment, is emerging as a promising intervention for improving shoulder joint mobility. Comprising seven methodical movements aimed at enhancing capsular stretch, synovial fluid distribution, and muscular flexibility, this technique has been associated with improved range of motion and reduced pain in individuals with shoulder dysfunction (6). Although its use has been documented in various musculoskeletal scenarios, limited evidence exists regarding its specific efficacy in certain high-risk subpopulations-namely, diabetic postmenopausal women. This demographic not only faces a heightened risk of developing adhesive capsulitis but also tends to experience more chronic and recalcitrant forms of the condition due to underlying hormonal and metabolic alterations (7). The rationale for presenting this case lies in the unique intersection of demographic and therapeutic variables. Diabetic postmenopausal women often respond less favorably to standard interventions for frozen shoulder, making the exploration of alternative therapeutic strategies a clinical priority (8). Despite the biomechanical and therapeutic plausibility of the Spencer Technique in addressing adhesive capsulitis, especially in cases marked by chronicity and systemic inflammation, there remains a conspicuous gap in literature documenting its efficacy in this specific cohort. The paucity of targeted research, coupled with the increasing clinical burden of frozen shoulder in diabetic postmenopausal women, underscores the need for focused investigations that can inform individualized patient care. This case report aims to describe the clinical course of a diabetic postmenopausal woman diagnosed with chronic adhesive capsulitis who underwent intervention with the Spencer Mobilization Technique. The objective is to highlight the functional recovery observed following this manual therapy and to consider the broader implications for its use as a primary or adjunctive intervention in similar patient populations. By sharing this clinical experience, the report seeks to contribute to the growing body of evidence supporting integrative manual therapies in the management of complex musculoskeletal disorders and to stimulate further research into their role in managing adhesive capsulitis within metabolically compromised demographics.

CASE PRESENTATION

A 55-year-old right-handed homemaker presented with a history of gradually progressive pain, stiffness, and restricted movement in her right shoulder over the past 8 to 10 months. She reported the insidious onset of difficulty in performing routine overhead activities, such as combing her hair and fastening her undergarments, which steadily worsened with time. These limitations significantly interfered with her daily functioning and quality of life. There was no reported history of trauma, previous shoulder injury, or surgical interventions. Her past medical history was significant for type 2 diabetes mellitus, diagnosed six years prior, and well-controlled hypertension. She also experienced menopause at the age of 45 and reported the onset of generalized joint pain after the age of 50, consistent with postmenopausal musculoskeletal changes. Despite the chronicity of her shoulder symptoms, she had not undergone any structured



physiotherapy regimen and had been relying solely on intermittent use of nonsteroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants for symptomatic relief. On physical examination, the patient was evaluated in a high sitting position. Vital signs were within normal limits. Local inspection did not reveal any swelling or deformity, but there was evident guarding and protective posturing of the right shoulder. Palpation revealed moderate diffuse tenderness (Grade 2) along the anterolateral aspect of the shoulder joint. Shoulder musculature appeared tense, and both active and passive movements were significantly restricted, particularly in activities involving overhead motion and reaching behind the back. Pain was reported during all attempts to move the joint, with greater discomfort observed during active movements compared to passive ones. These findings were suggestive of adhesive capsulitis in its frozen stage, characterized by capsular tightness and mechanical restriction of motion.

A structured assessment of the shoulder's range of motion revealed significant limitations on the affected side compared to the contralateral (left) shoulder. Flexion was limited to 90°, extension to 20°, medial rotation to 15°, lateral rotation to 25°, abduction to 80°, and adduction to 30°, whereas the left shoulder maintained near-normal mobility across all planes (Table 1). Pain intensity was quantified using the Visual Analogue Scale (VAS), with a score of 8/10 at rest and 9/10 with movement, confirming the severity of discomfort. Functional disability was evaluated using the Shoulder Pain and Disability Index (SPADI), with an initial score of 80%, indicating high levels of pain-related functional impairment. There was no indication for immediate imaging, as the clinical presentation and examination findings were consistent with primary adhesive capsulitis, and the absence of red flags or traumatic history further supported a diagnosis based on clinical evaluation alone. Nevertheless, had there been any suspicion of alternate pathology, imaging such as MRI or diagnostic ultrasound would have been considered to rule out rotator cuff pathology or other intra-articular abnormalities, as commonly recommended in refractory cases (9,10).

The patient's prior management strategy had been limited and largely pharmacological, involving over-the-counter analgesics and muscle relaxants, with no structured rehabilitative or manual therapy interventions. The absence of physiotherapy or manual mobilization had likely contributed to the chronicity and progression of capsular stiffness. Given the patient's medical background of diabetes and postmenopausal status-both risk factors for adhesive capsulitis with potentially poorer prognosis-an individualized, focused manual therapy approach was deemed appropriate. The Spencer Mobilization Technique was selected as the intervention of choice, considering its emerging role in improving joint mobility and reducing pain in adhesive capsulitis, particularly in populations with limited therapeutic responsiveness (3,4). During the intervention period, the patient's range of motion was regularly tracked across five consecutive weeks. A consistent and progressive improvement was observed in all shoulder movements. Flexion increased from 100° in the first week to 165° by the fifth week, while similar improvements were seen in extension (from 23° to 37°), medial rotation (19° to 45°), lateral rotation (32° to 65°), abduction (80° to 135°), and adduction (33° to 38°). Correspondingly, pain levels on the VAS decreased steadily, from 8/10 at rest and 9/10 with movement in the first week, to 0/10 and 3/10 respectively by the end of the fifth week. The SPADI score also reflected substantial functional gains, declining from 80% to 30%, indicating improved shoulder function and reduced pain (Table 2). This case underscores the role of manual therapy in facilitating joint recovery in adhesive capsulitis, particularly in diabetic postmenopausal women, a subgroup often challenged by prolonged disease duration and suboptimal recovery with standard care. The substantial functional improvements observed following the application of the Spencer Technique highlight its potential clinical value in similar patient profiles.

Outcome Measure	1 st week	2 nd week	3 rd week	4 th week	5 th week
ROMs					
Flexion	100°	110°	130°	150°	165°
Extension	23°	28°	32°	35°	37°
Medial Rotation	19°	25°	32°	37°	45°
Lateral Rotation	32°	45°	48°	54°	65°
Abduction	80°	100°	115°	125°	135°
Adduction	33°	35°	35°	37°	38°
VAS out of 10					
Without movement	8	5	4	2	0
With movement	9	7	6	4	3
Scoring SPADI	80%	65%	54%	42%	30%

Table 1:	Pre-assessment	of shoulder	movements
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Movement	Lt. Shoulder (°)	Rt. Shoulder (Affected) (°)
Flexion	175	90
Extension	40	20
Medial Rotation	60	15
Lateral Rotation	75	25
Abduction	160	80
Adduction	40	30

 Table 2: Post-assessment measures for the right shoulder over follow-up period.

TREATMENT / INTERVENTION

Understanding the intricate pathophysiology and neural mechanisms underpinning adhesive capsulitis is essential for the development of targeted and effective interventions, particularly in cases marked by severe pain and chronic stiffness. Recent evidence underscores the importance of tailoring treatment strategies according to the phase of the condition and individual patient characteristics, including metabolic comorbidities such as diabetes (11). In this case, a structured, phase-based rehabilitation program was adopted to address the patient's chronic right shoulder adhesive capsulitis. The treatment approach combined manual therapy—specifically the Spencer Mobilization Technique—with adjunctive modalities including electrotherapy and progressive therapeutic exercises. This multimodal strategy aimed to alleviate pain, restore functional mobility, and reduce disability. During the initial two weeks of treatment, the primary objective was pain modulation and preservation of the existing range of motion. A hot pack and Transcutaneous Electrical Nerve Stimulation (TENS) were administered for 15 minutes per session to relieve pain and enhance local circulation. Concurrently, Codman's pendulum exercises were introduced. These involved the patient assuming a forward-leaning posture with the affected arm hanging freely, performing gentle forward-backward, side-to-side, and circular motions. These passive mobilizations were performed in one set of ten repetitions per movement, six times per week, with the aim of promoting synovial fluid movement within the joint and reducing capsular tightness (9).

The Spencer Mobilization Technique was then incorporated as a primary manual intervention. Performed in side-lying and supine positions, this technique involved a series of seven structured mobilizations. In the side-lying position, flexion with humeral head rotation, extension with anterior glide, abduction with inferior glide, and circumduction in both clockwise and counter-clockwise directions were executed. In the supine position, external rotation with adduction and internal rotation with abduction were performed to target deeper capsular restrictions (12). Each mobilization was executed with the patient's elbow flexed and shoulder abducted to 90°, using the elbow as a pivot point while rotating the humerus bidirectionally. Gentle traction was applied to the glenohumeral joint to enhance capsular stretch and facilitate tissue elongation. These mobilizations were performed in two sets of ten repetitions per session, with a two-minute rest between sets, six sessions per week during the first two weeks (13). From the third to fifth weeks, the rehabilitation plan was progressively intensified. Electrotherapy was continued, although the duration of heat and TENS application was reduced to 10 minutes per session, given the patient's improved pain levels. The Codman's exercises were progressed in volume, increasing to 15–20 repetitions to promote active involvement and neuromuscular re-education. The Spencer Technique was also intensified by increasing the mobilization volume to three sets per session while maintaining six sessions per week. This progression was designed to maintain the gains in joint mobility, further reduce residual stiffness, and reestablish full functional use of the shoulder.

Over the five-week period, the patient demonstrated steady and clinically meaningful improvements in shoulder function. Pain scores on the Visual Analogue Scale (VAS) declined significantly, from 8/10 at rest and 9/10 during movement at baseline to 0/10 and 3/10 respectively by the fifth week. Functional capacity improved as reflected in the Shoulder Pain and Disability Index (SPADI), which decreased from 80% to 30%. Range of motion measurements revealed substantial gains across all planes, with flexion improving from 90° to 165°, and similar improvements noted in extension, rotation, abduction, and adduction. These improvements corresponded well with the therapeutic objectives of each treatment phase. No adverse effects, such as joint swelling, neurovascular complications, or post-treatment soreness, were reported throughout the intervention period, suggesting that the applied techniques were well-tolerated. When compared to conventional treatments such as corticosteroid injections and analgesics alone, which often provide temporary relief but limited long-term functional gains, the integrated use of Spencer's technique and physiotherapy demonstrated a more sustainable and functional recovery profile in this patient. This case supports the growing body of literature favoring the use of phase-specific manual



therapy protocols in chronic adhesive capsulitis, especially in metabolically vulnerable populations like diabetic postmenopausal women. The Spencer Mobilization Technique, when administered as part of a structured rehabilitation plan, may offer significant clinical value by addressing both the mechanical and neurological contributors to joint dysfunction.

Timeline	Intervention	Dosage
0-2 weeks	Electric heat therapy (hot pack & TENS application)	15 minutes per session
	Codman's exercises, involve the patient standing with the trunk slightly bent	10 rep., 1 set, 6 sessions/week (9)
	forward, allowing the affected arm to hang freely, including forward and	
	backward, side to side, and circular motions both clockwise and counter-	
	clockwise.	
	The Spencer Mobilization Technique was applied by first elbow flexing and	2 sets of 10 repetitions, 2-minute rest
	90 degrees abducting. Then shoulder joint rotated in both clockwise and anti-	between sets, 6 sessions/week
	clockwise directions, using the elbow as a pivot point. This was followed by	
	applying gentle traction to the shoulder joint while continuing to rotate the	
	humerus in both directions. (10)	
3-5	Electric heat therapy (hot pack & TENS application)	10 minutes per session
weeks		
	Progressed Codman's exercises (increased repetitions)	15-20 rep., 1 set, 6 sessions/week
	Progressed Spencer's technique (increased to 3 sets)	3 sets of 10 repetitions, 2-minute rest
		between sets, 6 sessions/week

OUTCOME AND FOLLOW-UP

The patient demonstrated notable improvements following the five-week physiotherapy program that integrated the Spencer Mobilization Technique with electrotherapy and therapeutic exercises. By the end of the intervention, significant reductions in pain intensity and improvements in joint mobility and function were observed. Within the first two weeks, she reported a marked decrease in resting and movement-related shoulder pain, as reflected by a drop in her VAS score from 8/10 at rest and 9/10 with movement to 5/10 and 7/10 respectively. These changes were accompanied by improved sleep and a noticeable reduction in shoulder tightness. By the fifth week, the patient had regained substantial range of motion in her right shoulder, with flexion increasing from a pre-treatment value of 90° to 165°, and comparable improvements noted in extension, abduction, and both internal and external rotation. Functional outcomes, measured using the SPADI, improved progressively across the intervention period, with scores decreasing from an initial 80% to 30%, denoting significant pain relief and reduction in activity limitations. The patient reported the ability to independently perform daily personal care tasks such as combing her hair and washing her back, activities that had previously been limited. However, she continued to experience difficulty tying her undergarments behind the back, attributed in part to localized soft tissue bulk and residual limitations in range.

A structured home exercise program was initiated concurrently and maintained throughout the follow-up period. This program consisted of basic active range of motion movements and pendulum exercises designed to sustain improvements and prevent re-stiffening of the joint capsule. The patient adhered well to this regimen, and no adverse events or complications were reported. Her ability to live independently and her intrinsic motivation to regain functional independence played a key role in her adherence and rapid recovery trajectory. Weekly follow-up sessions were scheduled after the formal five-week intervention period to ensure continuity of care and address any emerging concerns. During these visits, continued improvements were observed, and the patient was encouraged to maintain her home-based exercises. Additional factors contributing to the favorable outcome included her relatively well-controlled type 2 diabetes and ongoing use of menopause supplements known to support musculoskeletal health and bone density. Compared to the expected prognosis for chronic adhesive capsulitis in postmenopausal diabetic women, where recovery is often prolonged and incomplete, this patient exhibited a notably faster and more complete restoration of function. Literature suggests that the average duration for resolution of symptoms in chronic cases can span from 12 to 36 months (14), making the observed improvement over a five-week period clinically significant and suggestive of the added value of structured manual therapy interventions like the Spencer Technique. No complications, adverse reactions, or symptom flare-ups were reported throughout the intervention or follow-up phases. This case



reinforces the clinical utility of incorporating individualized manual therapy strategies into the treatment of adhesive capsulitis, particularly in populations traditionally considered at high risk for delayed recovery. The rapid progress and high level of functional restoration observed underscore the importance of early manual mobilization, consistent therapeutic exercises, and patient motivation in managing chronic frozen shoulder.

DISCUSSION

This case highlights the successful application of the Spencer Mobilization Technique in a 55-year-old diabetic postmenopausal woman with chronic adhesive capsulitis, demonstrating substantial improvements in shoulder range of motion, pain relief, and functional independence within a relatively short treatment duration. The incorporation of electrotherapy and therapeutic exercises supported the manual mobilization, leading to observable gains in activities of daily living (ADLs) and overall shoulder mechanics. What makes this case particularly noteworthy is the recovery achieved without invasive procedures, despite the patient's age and metabolic comorbidities, both of which are typically associated with delayed or incomplete recovery in frozen shoulder (15,16). The observed outcomes are consistent with and supported by several previous studies. A randomized controlled trial compared the Spencer Technique and Mulligan mobilization in individuals with frozen shoulder, concluding that both methods significantly improved shoulder movement and reduced pain, with no marked difference in outcome between the two techniques (17). Similarly, a study demonstrated the superiority of the Spencer Mobilization Technique over conservative management in terms of pain reduction and mobility gains in adhesive capsulitis (18). More recently, a study reinforced these findings by showing significant improvements in range of motion and functional status when the Spencer Technique was combined with isotonic exercises, encouraging its integration into broader rehabilitation protocols (19).

While many treatment approaches for adhesive capsulitis, such as corticosteroid injections or ultrasound-guided hydrodilatation, have shown benefit in reducing joint contracture and improving mobility, they may not address postural abnormalities or scapular mechanics. For instance, a study reported that although ultrasound-guided injections effectively expanded joint space and improved capsular mobility, limitations in scapular motion and posture persisted, contributing to continued discomfort and impaired functional outcomes (20). In contrast, the present case demonstrated that a manual mobilization-focused regimen not only improved shoulder range but also addressed movement patterns and postural adaptations without the need for pharmacologic or invasive interventions. The mechanism by which the Spencer Technique exerts its therapeutic effect likely involves the combination of joint capsule stretching, improved synovial fluid distribution, and neuromuscular re-education (21). The sequential mobilizations stimulate proprioceptive feedback, reduce capsular adhesions, and facilitate improved joint biomechanics. These effects, along with the adjunctive use of TENS and thermotherapy, contributed to pain modulation and tissue relaxation, enhancing the effectiveness of the mobilization process (22).

While the patient's progress was largely attributed to the structured intervention, other contributing factors must be acknowledged. Her strong intrinsic motivation, influenced by her independent lifestyle, likely promoted adherence to home exercises and follow-up sessions. Moreover, well-controlled diabetes and the use of menopause-related supplements supporting bone and joint health may have provided a favorable systemic environment for recovery (23). However, the potential for spontaneous improvement, known to occur in some frozen shoulder cases over time, cannot be completely ruled out as a contributing factor. Despite the positive findings, this case study carries certain limitations. Being a single-patient report, it inherently lacks the statistical power and generalizability of larger-scale studies. The absence of a control group makes it difficult to definitively isolate the effect of the Spencer Technique from other concurrent interventions. Additionally, the relatively short follow-up period limits the assessment of long-term sustainability of the improvements. Nonetheless, the case provides real-world clinical insight into a non-invasive, cost-effective treatment option for a complex patient population. These findings underscore the value of manual mobilization, particularly the Spencer Technique, in treating adhesive capsulitis in postmenopausal diabetic patients. They support the growing body of evidence advocating for the integration of joint-specific mobilization into comprehensive rehabilitation strategies. Future research should focus on larger randomized controlled trials with extended follow-up durations, comparing the Spencer Technique both as a standalone treatment and in combination with other physiotherapeutic or pharmacologic modalities. Additionally, studies exploring its impact on scapulohumeral rhythm, muscular strength, and long-term functional independence in different subpopulations could offer further clinical guidance.



CONCLUSION

This case illustrates the effectiveness of the Spencer Mobilization Technique as a non-invasive, targeted intervention for managing chronic adhesive capsulitis in a diabetic postmenopausal woman, resulting in meaningful reductions in pain and substantial improvements in range of motion and functional capacity. The integration of joint mobilization with electrotherapy and individualized patient education proved to be a safe and practical approach, particularly in a population often challenged by slower recovery due to metabolic and hormonal influences. Clinically, the case reinforces the importance of incorporating structured manual therapy into rehabilitation protocols for frozen shoulder, especially in complex cases where conventional management may fall short. It also highlights the critical role of patient adherence, lifestyle modification, and metabolic control in optimizing therapeutic outcomes. While the results are promising, future research involving larger, controlled studies is warranted to validate the broader applicability of this technique and to refine protocols for different patient subsets. Ultimately, this case supports the growing consensus that personalized, phase-based rehabilitation strategies—including manual therapy—can significantly enhance outcomes in musculoskeletal care.

Author	Contribution
	Substantial Contribution to study design, analysis, acquisition of Data
Bisma Ghauri*	Manuscript Writing
	Has given Final Approval of the version to be published
	Substantial Contribution to study design, acquisition and interpretation of Data
Adeena Nazim Mughal	Critical Review and Manuscript Writing
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Zarlish Manzoor	Substantial Contribution to acquisition and interpretation of Data
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Saba Asif	Contributed to Data Collection and Analysis
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Muhammad	Contributed to Data Collection and Analysis
Shayan Arshad	Has given Final Approval of the version to be published
Kainat Ashfaq	Substantial Contribution to study design and Data Analysis
	Has given Final Approval of the version to be published
Eraj Waqar Shaikh	Contributed to study concept and Data collection
	Has given Final Approval of the version to be published

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