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Review Article

Silent Manipulation for Frozen Shoulder: A Narrative Review of Its Origins, Philosophy, and Technical Approach

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Frozen shoulder (adhesive capsulitis) affects 2%–5% of the general population and up to 20% of diabetic patients, causing progressive pain and global restriction of shoulder motion lasting 18–30 months or longer. Silent manipulation—shoulder manipulation performed under ultrasound-guided cervical nerve root block with the patient awake—offers effective treatment for refractory cases, achieving a rapid range of motion (ROM) restoration with favorable safety compared to manipulation under general anesthesia or arthroscopic capsular release. This comprehensive technical manual synthesizes evidence and clinical experience from Japan where silent manipulation has been refined over decades. We detail patient selection criteria, pre-procedure evaluation including ROM assessment and magnetic resonance imaging findings, ultrasound-guided cervical nerve root block technique (C5–C7), intra-articular and periarticular corticosteroid injection, systematic manipulation protocols achieving 360°capsular release, post-procedure rehabilitation emphasizing rotator cuff re-education, and complication prevention strategies including local anesthetic systemic toxicity management. Published evidence demonstrates significant improvements in ROM and functional outcomes within weeks of the procedure, with sustained long-term benefits and minimal complications. Silent manipulation offers rapid symptom resolution, outpatient feasibility, cost-effectiveness, and avoidance of general anesthesia risks, representing a valuable treatment option for refractory frozen shoulder.

Keywords: *adhesive capsulitis, frozen shoulder, nerve block, silent manipulation, ultrasound guidance*

Introduction

Adhesive capsulitis, commonly known as frozen shoulder, represents a debilitating condition characterized by progressive pain and global restriction of both active and passive shoulder range of motion (ROM). Despite its prevalence—affecting approximately 2%–5% of the general population and up to 20% of individuals with diabetes mellitus—the optimal management strategy remains a subject of ongoing debate [1,2]. While conservative treatments, including physical therapy, corticosteroid injections, and analgesics, remain first-line interventions, a substantial proportion of patients experience prolonged symptoms lasting 18 to 30 months or longer, with some reports indicating persistent disability even after several years [3-5].

For patients who fail conservative management, intervention options have historically included manipulation under general anesthesia (MUA), arthroscopic capsular release, and open surgical procedures [6-8]. Each approach carries distinct advantages and limitations. MUA, while effective in rapidly restoring ROM, has been associated with significant complications, including humeral fractures, rotator cuff tears, labral injuries, glenohumeral dislocations, and neurovascular injuries, with reported complication rates

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ranging from 0.8% to 29.0% depending on the series and definition of complications [9-11]. Arthroscopic capsular release offers excellent visualization and controlled capsular division but requires operating room resources, general anesthesia, and specialized arthroscopic expertise [12-14].

Against this backdrop, silent manipulation has emerged as a distinctive therapeutic approach that occupies a unique position in the treatment algorithm for refractory adhesive capsulitis. Silent manipulation refers to shoulder manipulation performed under regional anesthesia—specifically, ultrasound-guided cervical nerve root block (C5, C6, and C7) or brachial plexus block—with the patient remaining awake throughout the procedure. This technique was pioneered and refined in Japan, where it has gained widespread acceptance as a treatment option for frozen shoulder [15-17].

The physiologic basis for silent manipulation rests on the understanding that adhesive capsulitis involves pathologic thickening and contracture of the glenohumeral joint capsule, particularly affecting the rotator interval, anterior capsule, coracohumeral ligament, and axillary recess [18-20]. Histopathologic studies have demonstrated dense fibrosis, collagen deposition, myofibroblast proliferation, and neovascularization within the affected capsule [21,22]. These structural changes result in mechanical restriction of motion that, beyond a certain threshold of severity and chronicity, may not respond adequately to conservative stretching alone. Controlled capsular disruption through manipulation aims to mechanically disrupt these adhesions and contracted structures, thereby rapidly restoring ROM and potentially accelerating the transition from the frozen to the thawing stage of the disease process.

Since its introduction, silent manipulation has been subjected to increasing scientific scrutiny. Multiple case series and comparative studies from Japanese institutions have reported favorable outcomes with relatively low complication rates [17,23]. These studies have documented significant improvements in ROM, pain scores, and functional outcome measures within weeks of the procedure, with sustained benefits at long-term follow-up. Complication rates appear substantially lower than those reported for MUA, potentially due to the awake patient's protective responses and the operator's ability to titrate force application based on patient feedback and tactile resistance [17,23].

Despite growing evidence supporting its efficacy and safety, silent manipulation remains relatively unknown outside Japan and select Asian centers. Western orthopedic literature contains limited discussion of this technique, and most English-language reviews of frozen shoulder treatment algorithms omit mention of manipulation under regional anesthesia as a distinct option. This knowledge gap represents a missed opportunity for patients and clinicians, as silent manipulation offers several practical advantages, including lower cost compared to arthroscopic procedures, outpatient feasibility, rapid return to rehabilitation, and potentially superior safety profile compared to MUA.

This review aims to provide a comprehensive technical manual for silent manipulation, synthesizing the accumulated experience and published evidence from Japan, where this technique has been refined over decades. The existing English-language literature on frozen shoulder manipulation focuses predominantly on techniques performed under general anesthesia, with limited detailed guidance on regional anesthesia approaches. This creates a significant knowledge gap for clinicians interested in adopting this technique but lacking mentorship or training opportunities. Our objective is to present a detailed, step-by-step guide that encompasses patient selection, pre-procedure evaluation, technical execution of ultrasound-guided nerve blocks, manipulation techniques, post-procedure management, and complication prevention strategies. By providing this comprehensive resource, we hope to facilitate wider adoption of silent manipulation and enable clinicians to offer this valuable treatment option to appropriate patients with refractory adhesive capsulitis.

Diagnosis of Frozen Shoulder

Accurate diagnosis of adhesive capsulitis is fundamental to appropriate treatment selection and is essential before considering any invasive intervention such as silent manipulation. The diagnostic process involves careful history taking, physical examination, imaging studies, and exclusion of alternative diagnoses that may mimic frozen shoulder.

Clinical History and Presentation

The classic presentation of adhesive capsulitis follows a well-described temporal pattern, traditionally divided into three overlapping stages: freezing, frozen, and thawing [24]. The freezing stage, lasting

2 to 9 months, is characterized by an insidious onset of shoulder pain that progressively worsens, particularly at night, accompanied by gradually increasing stiffness. Patients typically cannot identify a specific inciting event, although some report minor trauma or periods of immobilization. The frozen stage, lasting 4 to 12 months, features persistent stiffness with plateau or gradual improvement in pain intensity. The thawing stage, lasting 5 to 24 months, involves gradual spontaneous improvement in ROM, though complete resolution is not universal [3,25].

Key historical features supporting the diagnosis include bilateral involvement in 10%–40% of cases (though rarely simultaneously), association with diabetes mellitus (present in 10%–36% of adhesive capsulitis patients), history of prolonged immobilization, thyroid disorders, cardiovascular disease, Parkinson's disease, and autoimmune conditions [1,2,26]. The absence of significant trauma or surgical history helps distinguish primary (idiopathic) adhesive capsulitis from secondary forms. Age between 40 and 65 years and female sex represent additional epidemiologic risk factors [27].

Physical Examination

Physical examination remains the cornerstone of diagnosis. The hallmark finding is global restriction of both active and passive ROM, particularly affecting external rotation, abduction, and internal rotation. The proportional loss of active and passive motion distinguishes adhesive capsulitis from rotator cuff pathology, where active motion is typically more limited than passive motion [28].

Systematic ROM Assessment (Figure 1)

Forward Elevation (Flexion)

Elevation is measured with the patient standing, arm elevated in the scapular plane. Normal range is approximately 150–180°. In moderate to severe adhesive capsulitis, elevation may be restricted to 100° or less.

Abduction

This ROM is measured in the coronal plane. The restriction of abduction typically parallels the forward elevation limitation due to capsular pathology.

External Rotation at Side (1st Position External Rotation)

External rotation is measured with the arm at the side, the elbow flexed 90°, and the forearm rotating laterally. This motion is typically the most severely and earliest affected, often restricted to 10° or less in severe cases. This restriction reflects contracture of the anterior capsule, coracohumeral ligament, and rotator interval—structures that are taut in this position [29,30].

External Rotation at 90° Abduction (2nd Position External Rotation)

External rotation is measured with the shoulder abducted 90° and the elbow flexed 90°. Restriction in this position reflects middle and inferior glenohumeral ligament contracture and posterior capsule involvement.

Internal Rotation at 90° Abduction (2nd Position Internal Rotation)

Internal rotation is measured with the shoulder abducted 90° and the elbow flexed 90°. The forearm rotates medially toward the floor. This position assesses posterior capsule flexibility.

Internal Rotation (Hand-Behind-Back, HBB)

Internal rotation is measured by the highest vertebral level reached by the patient's thumb when reaching behind the back. Severe restriction may limit reach to the sacrum or buttock level (L5 vertebra or lower).

The concept of "end-feel" during passive ROM testing provides additional diagnostic information. In adhesive capsulitis, passive motion assessment reveals a characteristic "hard" or "capsular" end-feel—a firm, unyielding resistance with minimal elastic quality. The capsular end-feel reflects the mechanical restriction imposed by the contracted, fibrotic joint capsule and correlates with the pathologic changes observed histologically and on magnetic resonance imaging (MRI) [31].

Imaging Studies

While adhesive capsulitis remains primarily a clinical diagnosis, imaging plays a crucial role in excluding alternative pathology and, in some cases, confirming the diagnosis through characteristic findings.

Radiography

Standard radiographic evaluation should include true anteroposterior views in internal and external rotation, and scapular Y or outlet view. In primary adhesive capsulitis, radiographs are characteristically normal or

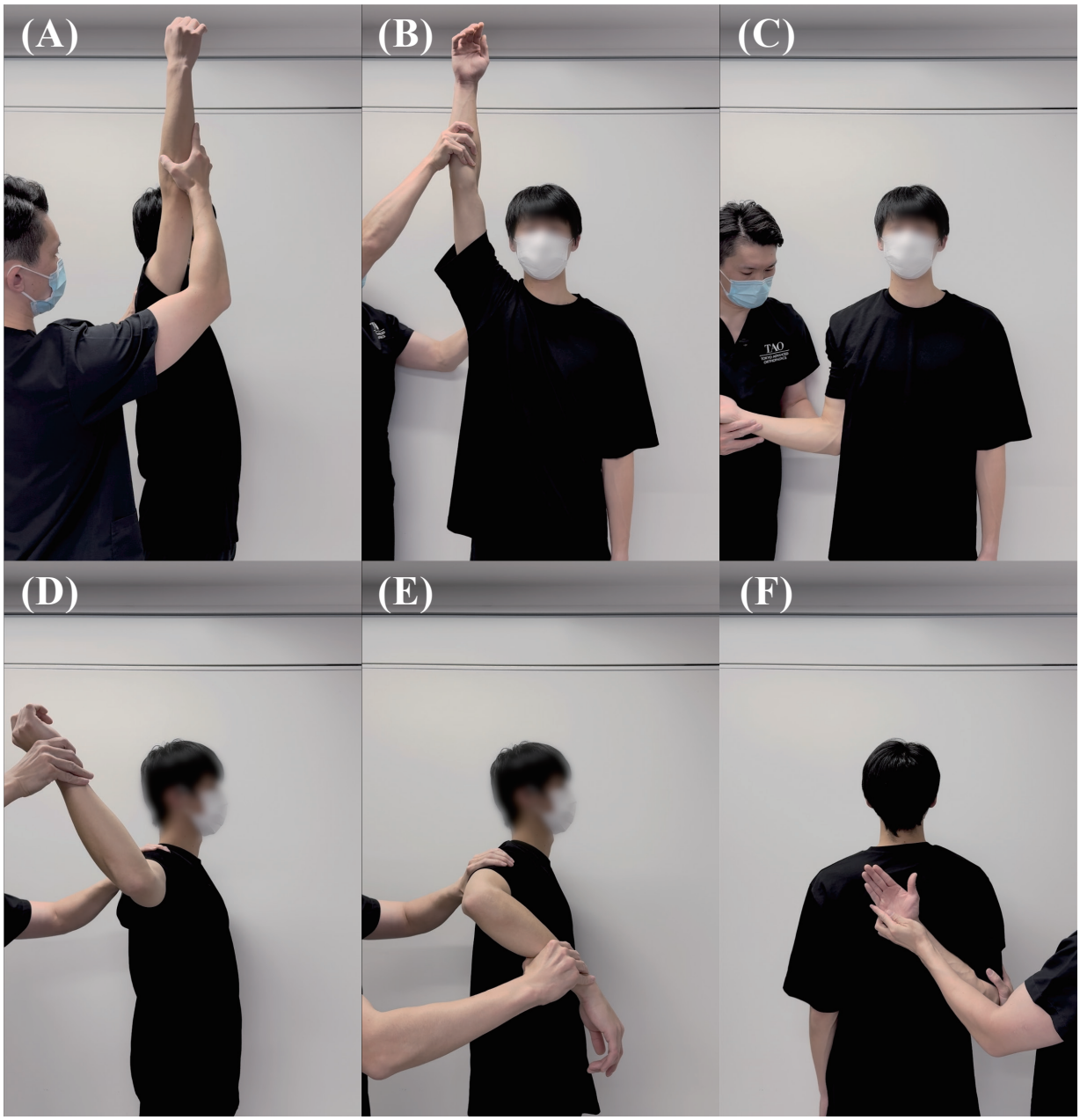


Figure 1. Range of Motion (ROM) Assessment

Systematic evaluation of shoulder ROM. (A) Forward elevation. (B) Abduction in the coronal plane. (C) External rotation at the side. (D) External rotation at 90° abduction. (E) Internal rotation at 90° abduction. (F) Hand-behind-back measured by the vertebral level reached.

show only osteopenia from disuse. The primary value of radiography lies in excluding alternative diagnoses such as glenohumeral osteoarthritis, calcific tendinitis, osteonecrosis, occult fracture, or superior migration of the humeral head, suggesting a massive rotator cuff tear [32].

MRI

MRI has emerged as a valuable tool for both confirming adhesive capsulitis and excluding alternative diagnoses. Characteristic MRI findings include thickening of the coracohumeral ligament (> 3–4 mm), thickening of the joint capsule in the rotator interval (> 4 mm), thickening and enhancement of the synovium in the rotator interval and axillary recess, and obliteration of the fat triangle between the coracoid process and the humeral head (Figure 2) [33-35]. Additional findings may include axillary recess

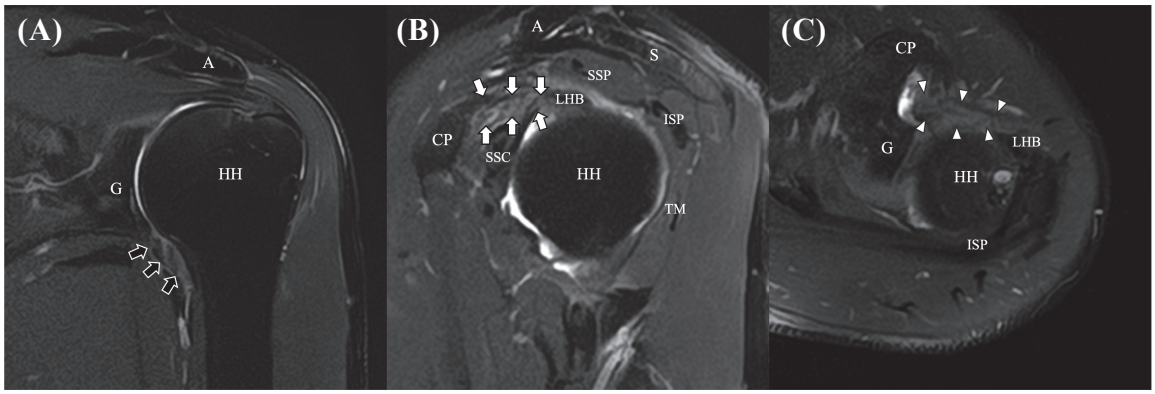


Figure 2. Magnetic Resonance Imaging (MRI) Findings in Frozen Shoulder

MRI demonstrating characteristic capsular pathology in frozen shoulder. (A) Coronal fat-suppressed image showing thickened glenohumeral joint capsule (black arrows) with reduced axillary recess volume. (B) Sagittal fat-suppressed image demonstrating thickened rotator interval capsule and coracohumeral ligament (white arrows). (C) Axial fat-suppressed image showing thickened rotator interval capsule and coracohumeral ligament (arrowheads).

Abbreviations: A, acromion; CP, coracoid process; G, glenoid; HH, humeral head; ISP, infraspinatus; LHB, long head of biceps tendon; SS, scapular spine; SSC, subscapularis; SSP, supraspinatus; TM, teres minor.

thickening and contraction, increased signal in the rotator interval on T2-weighted and STIR sequences, suggesting inflammation and edema, and occasionally increased signal in the subcoracoid fat pad [36,37]. MRI also helps identify calcific tendinitis, labral pathology, and glenohumeral osteoarthritis that might alter treatment planning [38,39].

Ultrasound

Dynamic ultrasound examination by experienced operators can demonstrate coracohumeral ligament thickening, rotator interval capsule thickening, and increased vascularity on Doppler imaging. Ultrasound offers the advantages of lower cost, dynamic assessment, and bilateral comparison, though it is more operator-dependent than MRI and provides less comprehensive evaluation of intra-articular structures [40,41].

Differential Diagnosis

Several conditions may mimic adhesive capsulitis and must be systematically excluded.

Rotator Cuff Pathology

Large or massive rotator cuff tears may present with restricted passive motion due to secondary capsular stiffness, a condition termed "pseudo-frozen shoulder." However, careful examination typically reveals greater restriction of active compared to passive motion, positive impingement signs, weakness on strength testing, and characteristic MRI findings of tendon disruption and muscle atrophy [42,43].

Glenohumeral Osteoarthritis

Advanced glenohumeral arthritis produces global motion restriction but is readily distinguished by radiographic findings of joint space narrowing, osteophyte formation, and subchondral sclerosis. The patient population tends to be older, and pain patterns differ, with mechanical pain predominating over the inflammatory pain of adhesive capsulitis [44].

Calcific Tendinitis

Acute calcific tendinitis can produce severe pain and reactive motion restriction, but it is easily distinguished by the presence of calcium deposits on radiographs. The clinical presentation is typically more acute, with severe pain preceding rather than accompanying the development of stiffness [45].

Cervical Radiculopathy

C5 or C6 radiculopathy may cause shoulder pain and apparent restricted motion due to pain and muscle weakness. However, careful examination reveals pain-limited rather than mechanically-restricted motion, presence of neck pain and specific radicular symptoms, positive Spurling's test, and normal passive motion under anesthesia or nerve block [46].

Neurologic Conditions

Stroke, Parkinson's disease, and complex regional pain syndrome may produce shoulder stiffness but are distinguished by the presence of associated neurologic findings and characteristic systemic features [47].

Comprehensive clinical assessment integrating history, physical examination, and imaging enables accurate diagnosis of adhesive capsulitis and appropriate patient selection for silent manipulation. The diagnostic process must confirm true capsular restriction, exclude contraindications to manipulation, and identify factors that may influence prognosis, such as diabetes mellitus or bilateral involvement.

The Practice of Silent Manipulation

Informed Consent and Patient Education

Following comprehensive history-taking, ROM assessment, and imaging review, the clinician should provide clear, detailed patient education about the diagnosis and proposed treatment. This informed consent process is critical for establishing realistic expectations, ensuring patient cooperation during the awake procedure, and fostering trust in the therapeutic relationship. When MRI images are available, visual demonstrations significantly enhance patient understanding.

The explanation should proceed as follows:

Diagnostic Explanation Using Imaging

Based on your history, physical examination, and imaging studies, you have frozen shoulder, also known as adhesive capsulitis. Let me show you what is happening in your shoulder using your MRI images. Your shoulder is a ball-and-socket joint. The rounded top of your arm bone—called the humeral head—fits into a shallow socket on your shoulder blade. These bones are connected by a structure called the joint capsule, which is normally thin and flexible, allowing smooth movement in all directions. However, in frozen shoulder, this capsule becomes abnormally thick and stiff. As you can see here on your MRI—this thickened, dark tissue surrounding your shoulder joint is the contracted capsule. This thickened capsule is what restricts your motion and causes your pain.

Natural History and Treatment Rationale

Frozen shoulder caused by this capsular thickening and contracture typically takes a very long time to resolve on its own—often one to two years or even longer. Furthermore, even after this prolonged period, many patients continue to experience residual stiffness and functional limitations that affect their daily activities and quality of life. The most effective treatment approach is to physically release or disrupt this thickened, contracted capsule. This is what we call "silent manipulation." The term "silent" refers to the fact that you remain awake during the procedure, but you feel no pain because we provide profound regional anesthesia—we numb only your shoulder and arm, not your entire body.

Anesthesia

Because attempting to manipulate your shoulder without anesthesia would be extremely painful, we first provide comprehensive pain control through nerve blocks. The nerves that supply sensation to your shoulder originate from your neck—specifically the fifth, sixth, and sometimes seventh cervical nerve roots. You will lie on your side and using ultrasound guidance to visualize the anatomy in real-time, I will inject local anesthetic medication around these nerve roots. This creates complete numbness in your shoulder, upper arm, and part of your chest wall, similar to the numbness you experience when a dentist numbs your mouth for dental work—but affecting your shoulder instead. Additionally, to minimize post-procedure inflammation and pain, we will inject corticosteroid medication both inside your shoulder joint and into the surrounding tissues. This anti-inflammatory medication helps control the body's response to the capsular disruption and facilitates your recovery.

Manipulation

Once complete anesthesia is achieved—which we verify by checking that you have no sensation or pain when I move your arm—I will systematically manipulate your shoulder through all planes of motion. The goal is to release or tear the contracted capsule in a controlled, comprehensive manner, addressing all restricted areas—front, back, top, and bottom of the joint, a full 360° release. During the manipulation, you may hear or feel popping, cracking, or tearing sensations as the tight capsular structures are disrupted. These sounds and sensations are expected and indicate successful capsular release. Because of the anesthesia, you should feel no pain during these manipulations. In the rare event that you do experience discomfort, please tell me immediately so I can address it. After the procedure is complete, we will place your arm in a sling for comfort and support during the initial recovery period.

Anesthesia Duration and Transportation

The nerve block provides pain relief for approximately 12 hours. Because this temporarily affects the

nerves that control your arm, you must not drive a car or ride a bicycle on the day of your procedure. Please arrange transportation—either use public transportation or have someone drive you to and from the hospital. The morning after your procedure, as the nerve block wears off, you will regain normal sensation and movement control. At this point, you may remove the sling and begin using your arm normally.

Activity Restrictions

Beginning the day after your procedure, there are no restrictions on your daily activities or sports participation. In fact, we encourage you to use your arm actively for all normal functions. The improved ROM achieved during the manipulation must be maintained and further developed through regular use and physical therapy.

Potential Risks and Complications

There are three important points you need to understand about potential risks and special circumstances.

First, although we use small doses of local anesthetic and inject carefully under ultrasound guidance, there is a theoretical risk of local anesthetic systemic toxicity (LAST)—a condition where the medication enters the bloodstream in excessive amounts. If this occurs, you may experience symptoms ranging from feeling unwell, confused, or agitated to, paradoxically, feeling euphoric or intoxicated—similar to the effects of alcohol. If any of these symptoms develop, we will immediately provide supportive treatment, including intravenous medications specifically designed to reverse local anesthetic toxicity. I emphasize that this complication is rare with the technique and dosing we use.

Second, your capsule may be so severely thickened and contracted that safe, complete release cannot be achieved. If I encounter extreme resistance during manipulation and judge that continuing would risk serious injury—such as shoulder dislocation, humeral fracture, or nerve damage—I will stop the procedure for your safety. This situation is exceedingly rare and occurs most commonly in very large, muscular male patients with extremely severe contracture. If this happens, we would discuss alternative treatment options, including possible arthroscopic capsular release surgery.

Third, while I can release the contracted capsule inside your joint, the prolonged period of stiffness before treatment has caused secondary tightness in the muscles surrounding your shoulder. To address this muscle tightness and to fully restore your shoulder function, you will need to participate actively in a structured physical therapy program supervised by our rehabilitation specialists. Here is a crucial fact you must understand: the capsular tissue that I release or tear during your manipulation will begin healing and potentially re-adhering within approximately 8 weeks after the procedure. If your rehabilitation progress is slow or if you do not participate actively in therapy during this window, the capsule may re-contract before you have achieved the full ROM. In approximately 7% of our patients, frozen shoulder recurs—meaning the capsule re-contracts and stiffness returns despite initial improvement. When this occurs, we may recommend a second silent manipulation to re-release the adhesions.

At our institution, we provide patients with an information sheet that includes several cautions (Figure 3). This written material allows patients to review the information.

Ultrasound-Guided Cervical Nerve Root Block (Video 1)

The cervical nerve root block provides profound shoulder anesthesia while keeping the patient awake and cooperative. This technique requires precise anatomic identification, clear ultrasound visualization, and careful injection technique.

The procedure is performed with the patient in the lateral decubitus position, lying on the contralateral side with the affected shoulder uppermost (Figure 4A). The patient's arm should rest alongside the body, avoiding shoulder elevation. This positioning prevents upward displacement of the shoulder girdle and creates adequate working space in the lateral neck, facilitating ultrasound visualization and safe needle insertion.

After sterile preparation, a high-frequency linear ultrasound transducer is positioned on the lateral neck in the short-axis plane to identify the cervical nerve roots and interscalene brachial plexus. The ultrasound image should clearly demonstrate the anterior and middle scalene muscles, with the hypoechoic circular structures of the cervical nerve roots visible between these muscles. The C5, C6, and C7 nerve roots should be identified and distinguished from the vertebral artery and internal jugular vein (Figure 4B).

We use 0.25% ropivacaine as the local anesthetic, chosen for its favorable duration. Total volume is adjusted by sex: female patients receive 15 mL, male

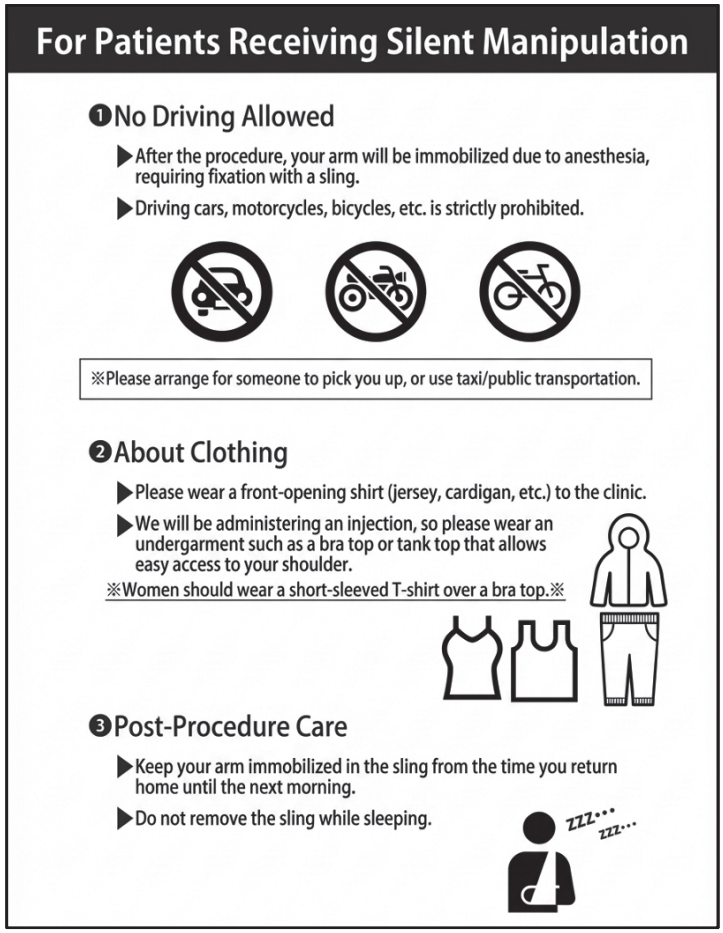
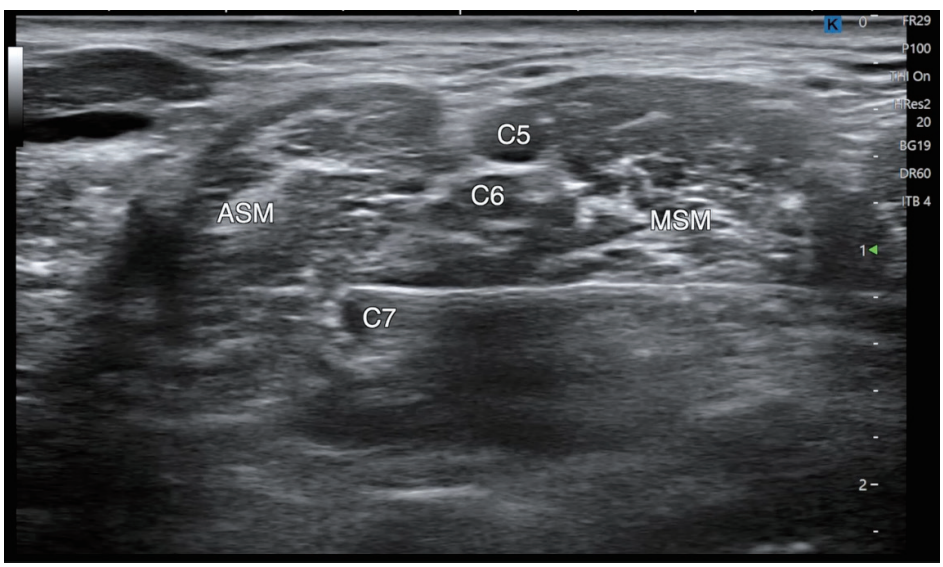


Figure 3. Patient Instruction Sheet for Silent Manipulation

Standardized patient education material distributed prior to silent manipulation. The sheet covers three essential components: (1) No driving allowed—vehicles prohibited due to anesthesia and arm immobilization. (2) Appropriate clothing—front-opening shirts and shoulder-exposing undergarments required. (3) Post-procedure care—continuous sling use from procedure completion until the next morning, including during sleep.



Video 1. Ultrasound-Guided Cervical Nerve Root Block

Note: The video can be accessed at https://doi.org/10.29760/APJP.202603_36(1).0003

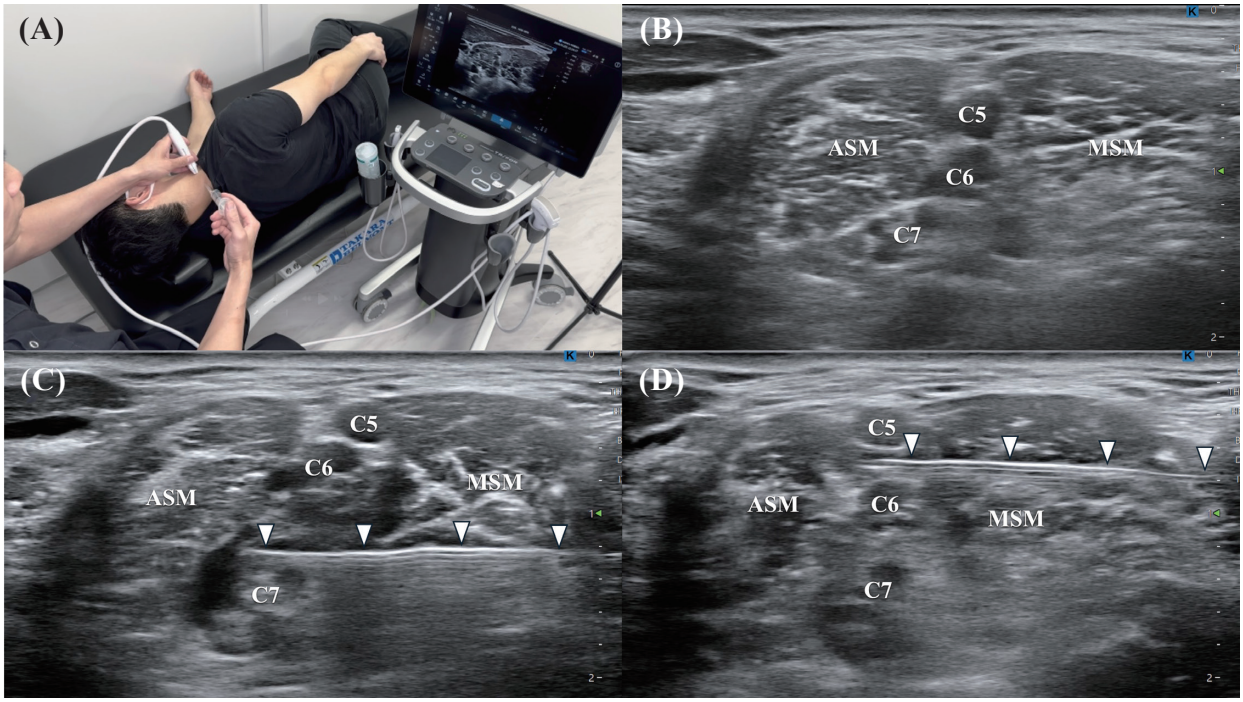


Figure 4. Ultrasound-Guided Cervical Nerve Root Block

Ultrasound-guided cervical nerve root block procedure for silent manipulation. (A) Patient positioning in lateral decubitus with the affected shoulder uppermost, arm resting alongside the body. (B) Pre-injection image identifying cervical nerve roots C5, C6, and C7 between the scalene muscles. (C) During the injection showing local anesthetic spread around C7. (D) During the injection demonstrating local anesthetic between C5 and C6.

Abbreviations: Arrowheads, needle; ASM, anterior scalene muscle; MSM, middle scalene muscle.

patients receive 20 mL. This dosing reflects differences in body weight.

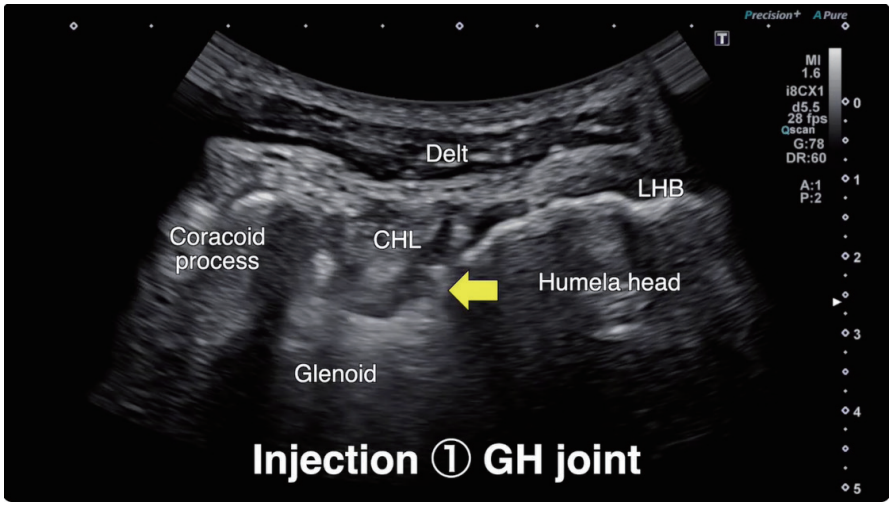
First, the C7 nerve root receives 3 to 5 mL of ropivacaine. The needle advances under continuous ultrasound guidance using an in-plane approach, maintaining visualization of the entire needle shaft and tip. After careful aspiration to exclude intravascular placement, the local anesthetic is injected slowly. Successful perineural spread appears as hypoechoic fluid surrounding the nerve root (Figure 4C). C7 blockade is essential for complete shoulder anesthesia, as it contributes to the inferior trunk of the brachial plexus.

Second, the needle is redirected to the interscalene space between C5 and C6. The remaining 12 to 15 mL of ropivacaine is injected within the neural sheath (Figure 4D). During this injection, a critical safety technique must be employed: the needle tip should be kept in continuous, gentle motion throughout the injection. This constant micro-movement prevents the needle from becoming fixed in position and reduces the probability of inadvertent intravascular injection. Should the needle tip enter a small vessel, this movement increases the likelihood that the opening will move away from the vessel lumen before significant volume is injected. Additionally, aspiration should be performed every 3 to 5 mL to verify the absence of blood return.

Shoulder Injection (Video 2)

Following completion of the cervical nerve root block, the patient is repositioned to the supine position for glenohumeral and periarticular steroid injections (Figure 5A). These injections serve to minimize post-manipulation inflammation and pain, facilitating early rehabilitation.

The injectate consists of 20 mg of triamcinolone acetonide diluted in 10 mL of normal saline. A high-frequency linear or convex ultrasound transducer is positioned on the anterior aspect of the shoulder in the short-axis plane relative to the body axis. The ultrasound image should clearly visualize the humeral head, glenohumeral joint space, coracohumeral ligament, and the base of the coracoid process of the scapula (Figure 5B). The injection proceeds in three sequential steps using a single needle insertion with redirection.



Video 2. Shoulder Injection

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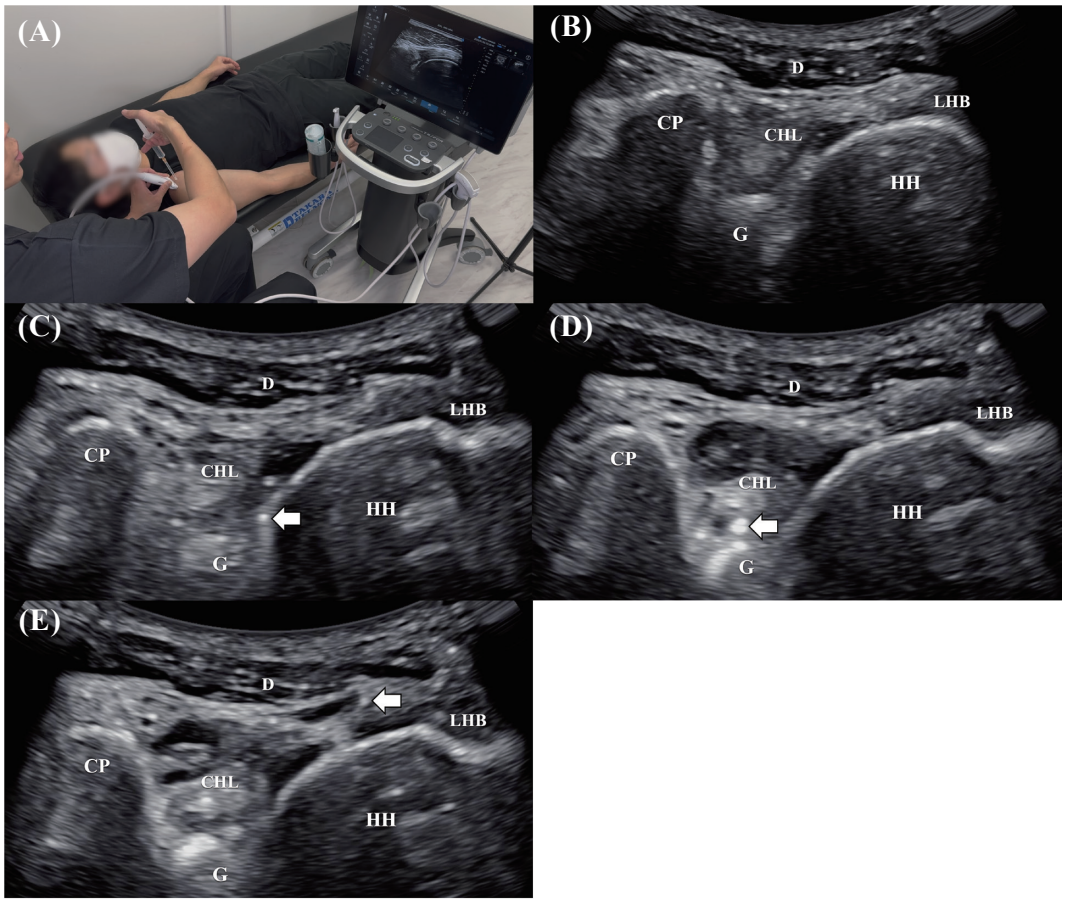

Figure 5. Shoulder Injection

Ultrasound-guided corticosteroid injection procedure following cervical nerve root block. (A) Patient repositioned to the supine position for glenohumeral and periarticular steroid injections. (B) Ultrasound image demonstrating clear visualization of the humeral head, glenohumeral joint space, coracohumeral ligament (CHL), and the base of the coracoid process (CP). (C) After confirming intra-articular placement, 4 mL of corticosteroid solution is injected into the joint cavity. (D) Needle tip positioned within the CHL at the coracoid base with injection of 4 mL of solution. (E) Needle tip positioned within the subacromial bursa with injection of the remaining 2 mL of solution.

Abbreviations: D, deltoid muscle; G, glenoid; HH, humeral head; LHB, long head of biceps tendon.

First, the needle is advanced under ultrasound guidance into the glenohumeral joint space. After confirming intra-articular placement, 4 mL of the corticosteroid solution is injected into the joint cavity (Figure 5C). This intra-articular injection addresses synovial inflammation and helps prevent reactive effusion following capsular disruption.

Second, the needle is withdrawn partially and redirected medially toward the base of the coracoid process. The needle tip is positioned within the coracohumeral ligament at the coracoid base, and 4 mL of solution is injected (Figure 5D). This targets the rotator interval and coracohumeral ligament, which are typically thickened and contracted in frozen shoulder.

Third, the needle is again withdrawn partially and redirected laterally and superficially toward the subacromial space. The needle tip is positioned within the subacromial bursa, and the remaining 2 mL of solution is injected (Figure 5E). This subacromial injection addresses inflammation in the bursa and surrounding rotator cuff tendons, which often exhibit secondary inflammatory changes due to prolonged restriction and compensatory mechanics.

Following completion of all injections, the needle is removed, and a sterile dressing is applied.

Waiting for Anesthetic Onset

After completing the cervical nerve root block and shoulder injections, approximately 20 minutes are required for the anesthetic to take full effect.

Interscalene brachial plexus block carries a well-recognized risk of ipsilateral phrenic nerve palsy due to local anesthetic spread to the phrenic nerve, which courses along the anterior scalene muscle near the injection site. Phrenic nerve blockade results in hemidiaphragmatic paralysis, typically well-tolerated but potentially causing subjective respiratory symptoms [48,49].

When patients remain supine during onset, gravitational effects on pulmonary mechanics and increased physiologic dead space can exacerbate discomfort. Patients may report chest heaviness or shortness of breath. To minimize these sensations, patients should sit upright or semi-recumbent during the waiting period. The upright posture optimizes diaphragmatic mechanics and alleviates dyspnea. Patients should be reassured that any breathing difficulty is temporary and expected.

After 20 minutes, block adequacy is assessed. The patient should be unable to actively elevate the affected arm due to motor blockade. When the examiner passively moves the shoulder, the patient should report a complete absence of pre-block pain. Only when complete sensory and motor blockade are confirmed should manipulation commence.

Manipulation Technique (Video 3)

Following confirmation of complete anesthesia, the systematic manipulation procedure begins with the patient in the supine position. The manipulation follows a specific sequence designed to address all planes of restricted motion and ensure comprehensive 360° capsular release.

Supine Position

In the supine position, manipulation proceeds through the following sequence: horizontal adduction,

Video 3. Manipulation Technique
Note: The video can be accessed at https://doi.org/10.29760/APJP.202603_36(1).0003

horizontal adduction with inferior traction, horizontal adduction with internal rotation, horizontal adduction with internal rotation in circular motion (both directions), horizontal adduction with external rotation, horizontal adduction with external rotation in circular motion (both directions), horizontal adduction transitioning to elevation, elevation with internal and external rotation, elevation transitioning to abduction with external rotation, abduction with external rotation transitioning to external rotation at side, then to extension, extension with external rotation, and extension with internal rotation (Figure 6).

Lateral Decubitus Position

The patient is then repositioned to the lateral decubitus position, lying on the contralateral side with the affected shoulder uppermost. Manipulation continues through the following sequence: abduction transitioning to external rotation at the side, extension with adduction, extension with adduction and internal rotation (HBB position), extension, extension with external rotation, extension with internal rotation, internal rotation, internal rotation transitioning to horizontal adduction with internal rotation, returning to the initial horizontal adduction position (Figure 7).

This complete circuit systematically addresses all capsular adhesions in a circumferential pattern. The entire sequence should be repeated at least twice to ensure comprehensive capsular release. During each movement, the operator applies controlled force until resistance is met, then gradually increases pressure. In areas of severe contracture, a palpable release or audible "pop" may be felt or heard, indicating capsular disruption. The presence and location of these pops vary considerably. Severely contracted shoulders may produce multiple pops circumferentially, while less restricted shoulders may produce pops only in the tightest areas or none at all. The absence of pops does not necessarily indicate inadequate manipulation, as effective capsular release can occur through gradual stretch without dramatic disruption.

Technical Tips and Precautions

Supine Position

The posterior capsule is relatively pliable and releases more easily, making horizontal adduction the logical starting point. During the sequence from elevation through abduction with external rotation to external rotation at the side, the capsule is typically thicker and more resistant to release. Success is enhanced by using the posterior capsular release achieved during horizontal adduction as the starting point, then progressively and continuously connecting subsequent releases along the circumference of the capsule.

During elevation, abduction with external rotation, and external rotation at the side, significant shear and rotational stress are applied to the glenohumeral joint and proximal humerus. To minimize the risk of fracture or dislocation, the operator's hand should continuously apply anteroposterior pressure on the humeral head, pushing it posteriorly into the glenoid to maintain joint congruity and stability (Figure 8A). A wheeled chair facilitates smooth repositioning of the operator's body as the arm moves through different planes, maintaining optimal ergonomics and control.

Lateral Decubitus Position

During the transition from abduction to external rotation at the side, manually stabilizing the scapula in an abducted position—preventing scapular retraction—enhances release of the anterior and anterosuperior capsule (Figure 8B). To maintain the shoulder in external rotation during this maneuver, the operator's forearm should press against the lateral aspect of the patient's elbow, preventing inadvertent internal rotation (Figure 8C). Similarly, during extension with adduction and HBB positions, the scapula should be manually stabilized to prevent retraction, optimizing capsular stretch. When performing the HBB maneuver, confirm that the thumb reaches sufficiently high on the spine, ideally to the mid to upper-thoracic level (Figure 8D).

Overall

The described sequence represents an ideal template rather than a rigid protocol. The initial release point varies among patients and does not always begin with horizontal adduction. The operator should identify areas of relatively less resistance, establish the first capsular release there, and then progressively extend the release continuously to adjacent areas. Never force premature disruption of severely contracted regions, as this risks fracture or dislocation. The key principle is finding the path of least resistance and connecting releases systematically around the joint circumference.

Achievement of an adequate ROM serves as an important indicator of successful capsular release.

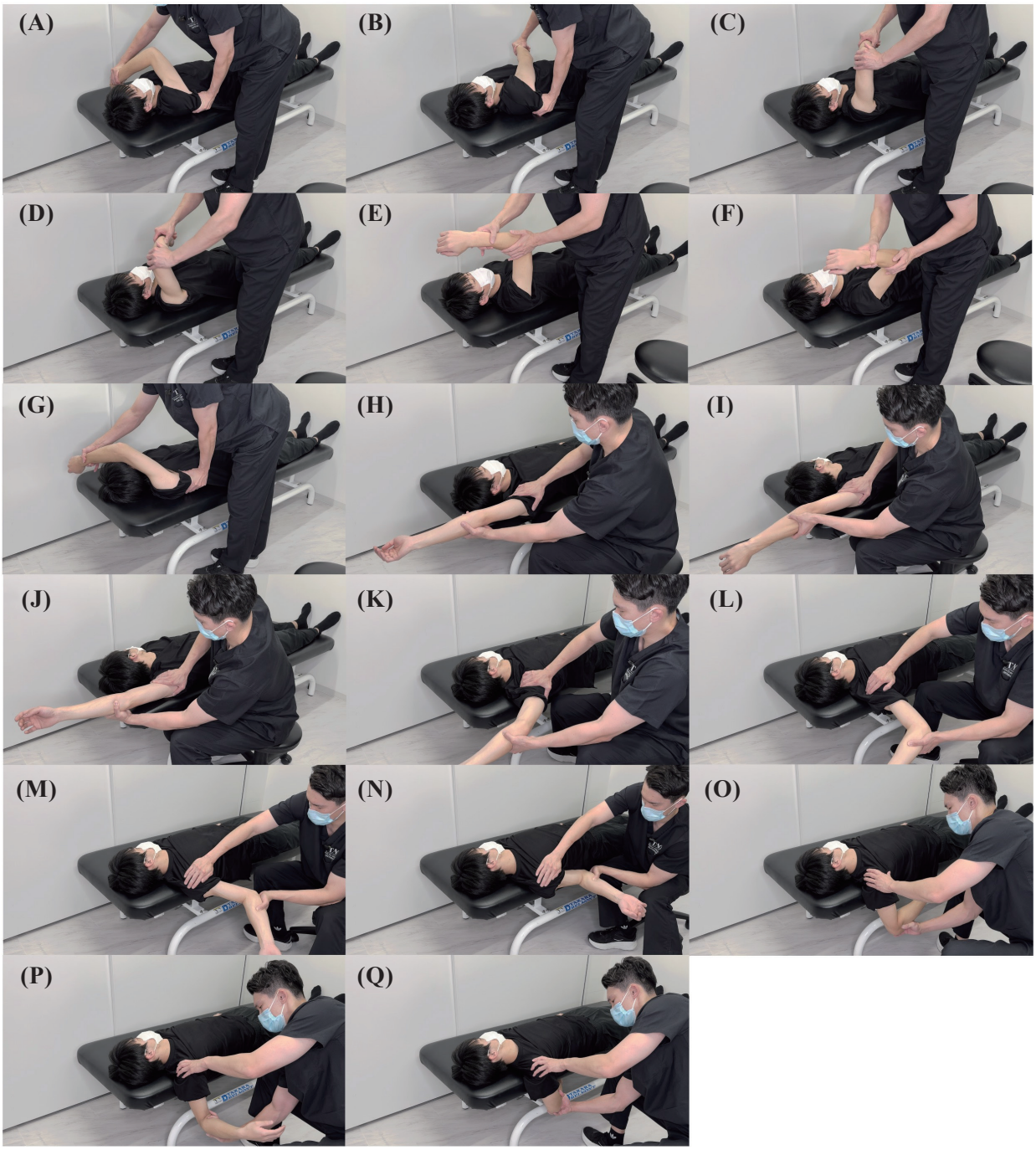

Figure 6. Sequential Manipulation Technique in Supine Position

Step-by-step progression of silent manipulation performed in the supine position. (A) Horizontal adduction. (B) Horizontal adduction with inferior traction. (C) Horizontal adduction with internal rotation. (D) Horizontal adduction with internal rotation in circular motion (both directions). (E) Horizontal adduction with external rotation. (F) Horizontal adduction with external rotation in circular motion (both directions). (G) Horizontal adduction transitioning to elevation. (H) Elevation. (I) Elevation with internal rotation. (J) Elevation with external rotation. (K) Elevation transitioning to abduction with external rotation. (L) Abduction with external rotation. (M) Abduction with external rotation transitioning to external rotation at the side. (N) External rotation at the side. (O) Extension. (P) Extension with external rotation. (Q) Extension with internal rotation.

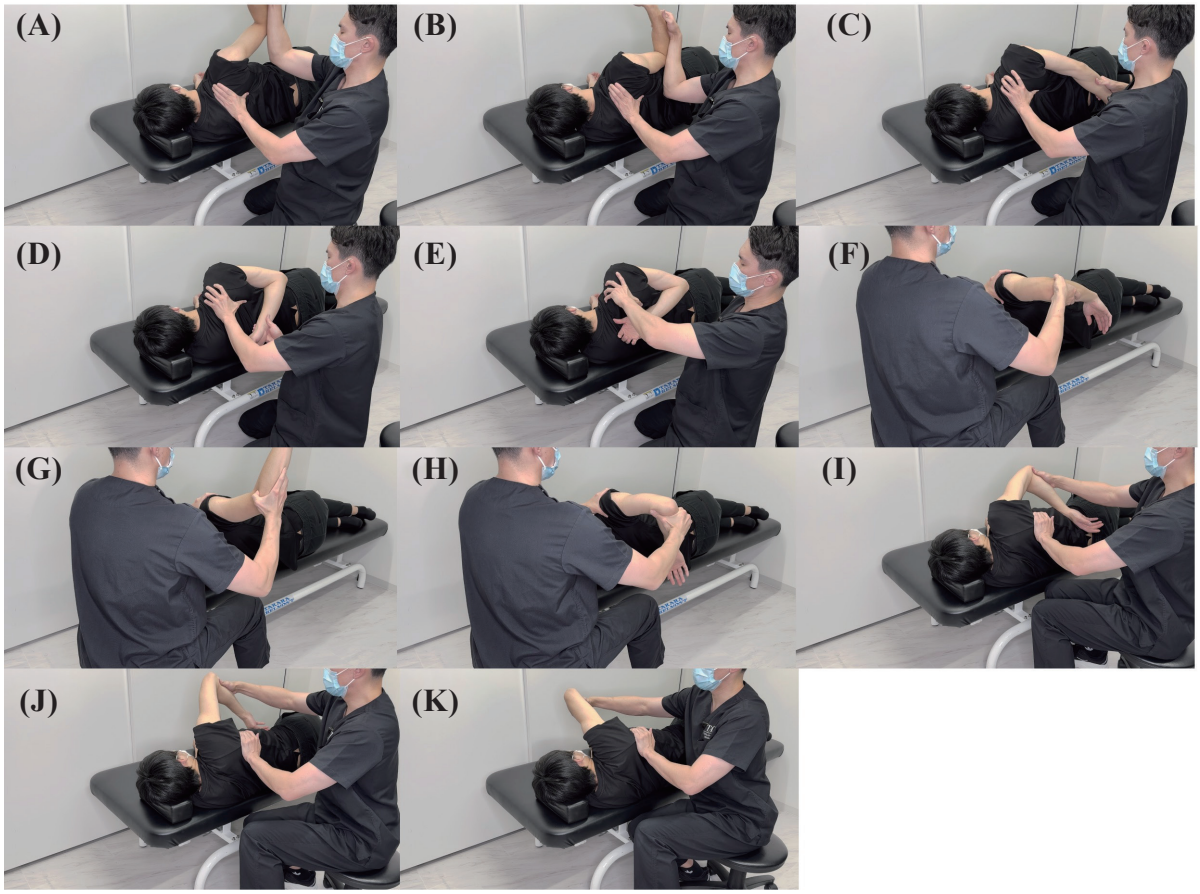

Figure 7. Sequential Manipulation Technique in Lateral Decubitus Position

Step-by-step progression of silent manipulation performed in the lateral decubitus position with the affected shoulder uppermost. (A) Abduction transitioning to external rotation at the side. (B) External rotation at the side. (C) Extension with adduction. (D) Extension with adduction transitioning to extension with adduction and internal rotation. (E) Extension with adduction and internal rotation (hand-behind-back position). (F) Extension. (G) Extension with external rotation. (H) Extension with internal rotation. (I) Internal rotation. (J) Internal rotation transitioning to horizontal adduction with internal rotation. (K) Horizontal adduction with internal rotation, returning to the initial horizontal adduction position.

The contralateral shoulder's ROM must be measured preoperatively, and the manipulated shoulder should achieve at least equivalent motion. Theoretically, the anesthetized and muscle-relaxed shoulder should achieve even greater motion than the contralateral side. Target ranges include: forward elevation 180°, external rotation at side 60°, external rotation at 90° abduction 100°, internal rotation at 90 degrees abduction 45°, and HBB reaching approximately T2 to T5 vertebral level.

During the second circuit through the manipulation sequence, attention should be paid to the end-feel at terminal range in each plane. A hard, capsular end-feel suggests incomplete release and warrants additional manipulation in that direction. When performing the final assessment of capsular release, observe the trajectory of humeral motion. If a localized area of unreleased capsule remains, the humeral motion becomes irregular or "catches" when stress is applied to that specific area, disrupting the smooth arc of movement.

Post-Procedure Management and Rehabilitation

Immediately following manipulation, while the nerve block remains effective and the patient cannot actively control the arm, a sling is applied to support the upper extremity and prevent inadvertent injury from uncontrolled limb movement. This sling should be worn until the anesthesia wears off, typically within 12 hours.

Once sensation and motor control return, there are no specific activity restrictions, provided the patient experiences no significant pain. Patients are encouraged to use the arm actively for all normal daily

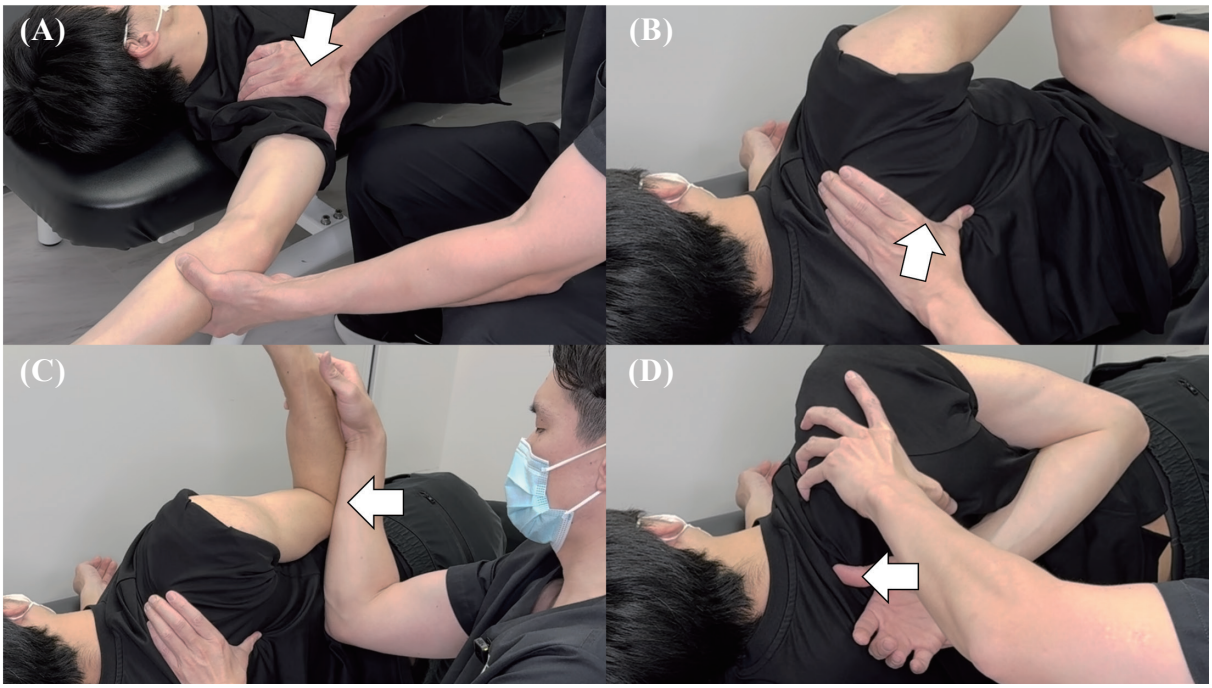

Figure 8. Key Technical Points During Silent Manipulation

Critical technical considerations to minimize complications and optimize capsular release during silent manipulation. (A) The operator's hand continuously applies anteroposterior pressure on the humeral head, pushing it posteriorly into the glenoid to maintain joint congruity and stability, minimizing the risk of fracture or dislocation. (B) During the transition from abduction to external rotation at the side, manual stabilization of the scapula in an abducted position prevents scapular retraction and enhances the release of the anterior and anterosuperior capsule. (C) The operator's forearm presses against the lateral aspect of the patient's elbow to maintain the shoulder in external rotation and prevent inadvertent internal rotation. (D) During the hand-behind-back maneuver, the thumb is confirmed to reach sufficiently high on the spine, ideally to the mid- to upper-thoracic level.

activities. While not specifically recommended, some patients resume sports activities as early as the day after the procedure without adverse effects. The key principle is that the improved ROM achieved during manipulation must be maintained through active use; prolonged immobilization risks re-contracture of the released capsular tissues.

Following resolution of the capsular restriction, rehabilitation focuses on addressing functional impairments that persist due to prolonged disuse and compensatory movement patterns. Physical therapy should not consist merely of passive stretching exercises. Rather, active rotator cuff muscle re-education represents a critical component of successful rehabilitation. The prolonged period of restricted motion before manipulation often results in rotator cuff muscle inhibition, altered scapulohumeral rhythm, and dysfunctional movement patterns that do not resolve spontaneously despite restoration of the passive ROM.

Kawabata et al. [50] recently described an ultrasound-guided approach to rotator cuff re-education for patients with residual dysfunction following silent manipulation. Their technique utilizes real-time ultrasound feedback to help patients visualize and activate specific rotator cuff muscles that have become inhibited. By observing muscle contraction on the ultrasound screen during active movement, patients develop improved neuromuscular control and kinesthetic awareness. This approach addresses the common problem of persistent weakness and altered movement patterns despite adequate passive ROM, facilitating more complete functional recovery and reducing the risk of recurrent stiffness.

Management of Recurrent Cases

ROM must be measured at every follow-up visit to monitor whether continuous improvement is occurring. Plateau or decline in ROM warrants careful attention. When ROM improvement ceases, and end-feel assessment reveals a hard, capsular quality at terminal range, recurrent capsular contracture should be suspected.

When recurrent capsular contracture is identi-

fied, rehabilitation alone is unlikely to yield significant improvement. As discussed during the initial informed consent process, a second silent manipulation is indicated. The typical timeframe for repeat manipulation is approximately 8 weeks after the initial procedure, though this may vary depending on individual patient circumstances. Some patients require earlier intervention if rapid re-contracture occurs, while others may benefit from a longer trial of intensive rehabilitation before proceeding to repeat manipulation.

The technique for repeat manipulation is identical to the initial procedure, including ultrasound-guided cervical nerve root block, intra-articular and periarticular corticosteroid injection, and systematic circumferential manipulation. The need for repeat manipulation occurs in approximately 7% of patients, and most achieve satisfactory outcomes after the second procedure.

Discussion

Clinical Outcomes of Silent Manipulation

The efficacy and safety of silent manipulation have been documented in multiple Japanese studies, providing robust evidence for this technique as a valuable treatment option for refractory frozen shoulder. Three representative studies illustrate the clinical outcomes, demonstrating consistent improvements in ROM, functional scores, and patient satisfaction.

Park et al. [51] conducted a large retrospective study evaluating 1,665 shoulders in 1,610 patients who underwent silent manipulation between 2013 and 2017. The study population included 519 men and 1,146 women with a mean age of 55.4 years and a mean symptom duration of 6.6 months. ROM improved dramatically and rapidly. Forward flexion improved from 98.8° before manipulation to 155.5° at 3 months, abduction from 75.6° to 152.9°, and external rotation from 12.7° to 45.9°. These improvements were evident as early as 1-week post-procedure and were sustained throughout the 3-month follow-up period. Notably, no complications requiring additional treatment or serious adverse events occurred in this large cohort. The study demonstrated that silent manipulation achieved early improvement in shoulder ROM without complications, offering a safe and effective alternative to MUA or arthroscopic capsular release.

In a subsequent study examining technique refinement, Park et al. [52] investigated whether enhanced manipulation protocols could further optimize external rotation outcomes, which had been identified as an area warranting improvement. This study compared conventional silent manipulation with an enhanced manipulation technique that incorporated modified positioning and force application strategies. The enhanced technique demonstrated superior external rotation outcomes compared to conventional manipulation. External rotation at the side improved from 12.5° before manipulation to 57.9° at 1 month and 57.4° at 2 months with the enhanced technique, compared to 44.7° and 43.1° respectively with conventional manipulation. Forward flexion and abduction also showed modest improvements with the enhanced technique, though differences were less pronounced than for external rotation. These findings suggest that technical refinements in manipulation strategy can yield incremental improvements in specific motion planes, particularly external rotation, which is often the most severely restricted movement in frozen shoulder.

Miyatake et al. [53] prospectively evaluated 53 patients who underwent silent manipulation between October 2020 and January 2022, with particular attention to patient-reported outcomes and the influence of operator experience. This study assessed not only ROM but also functional outcomes using the Disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire and the Shoulder 36 (Sh36) questionnaire. Forward flexion improved from 102.7°s pre-manipulation to 160.5° at 1 year, abduction from 89.1° to 160.6°, external rotation from 22.4° to 62.2°, and HBB from L4.5 vertebral level to Th8.1. Patient-reported outcomes showed equally impressive improvements. The DASH score improved from 31.8 pre-manipulation to 10.2 at 1-year post-manipulation, reflecting substantial functional improvement. All domains of the Sh36 questionnaire—including pain, ROM, muscle strength, activities of daily living, and general health—demonstrated statistically significant improvements at both 3 months and 1 year follow-up.

An important finding of the Miyatake study was the influence of operator experience on outcomes. While both experienced and less experienced operators achieved significant ROM improvements, the experienced operator achieved superior outcomes in external rotation and HBB positioning compared to the less experienced operator. Similarly, the experienced operator achieved better patient-reported outcomes

in the Sh36 pain, muscle strength, and activities of daily living domains. These differences suggest that technical proficiency in performing external rotation manipulation and release of the rotator interval structures—including the coracohumeral ligament—may be particularly important for optimizing patient satisfaction and functional outcomes. The study authors concluded that technical expertise is essential to achieve optimal improvements in internal and external rotation, pain relief, and muscle strength.

Collectively, these studies demonstrate that silent manipulation consistently produces rapid, substantial, and sustained improvements in ROM and functional outcomes for patients with a refractory frozen shoulder. The technique appears safe when performed by trained operators, with complication rates substantially lower than those historically reported for MUA. The rapid improvement—often evident within the first week—allows patients to avoid the prolonged disability typically associated with conservative management of a frozen shoulder. While operator experience influences certain outcome domains, particularly external rotation and patient satisfaction measures, even less experienced operators achieve clinically meaningful improvements when adequately trained in the technique.

Indications and Timing for Silent Manipulation

The success of silent manipulation is critically dependent on appropriate patient selection and optimal timing of intervention. Understanding both the conventional indications and evolving criteria is essential for maximizing clinical outcomes while minimizing risks.

Conventional Indications Based on ROM Criteria

According to Japanese literature on silent manipulation, conventional indications include ROM restrictions with forward elevation limited to 100° or less, external rotation restricted to 10° or less, and internal rotation (HBB position) limited to the L5 vertebral level or below [15-17]. These criteria represent severe functional limitations that significantly impair activities of daily living. Additionally, standard practice recommends attempting conservative management, including nonsteroidal anti-inflammatory drugs, intra-articular corticosteroid injections, and physical therapy, for a minimum duration of 3 to 6 months before proceeding to manipulation [15-17].

Expanded Indications in Contemporary Practice

While traditional criteria focus on severe motion restriction, contemporary practitioners have expanded the indications based on functional assessment and quality of life considerations. At our institution, we have adopted a more liberal approach: even in cases where forward elevation exceeds 100°, if passive ROM remains restricted and daily activities are significantly impaired, we actively perform silent manipulation. This philosophy recognizes that absolute ROM measurements do not always correlate with functional disability and patient suffering. Some patients with "moderate" restriction by numerical criteria experience substantial functional limitation, occupational disability, or sleep disturbance that justifies intervention.

This expanded approach requires careful clinical judgment, incorporating not only goniometric measurements but also assessment of end-feel during passive motion, functional capacity in work and daily activities, sleep quality, and psychological impact of persistent symptoms. The decision to proceed with manipulation in less severely restricted shoulders should be individualized, weighing potential benefits against procedural risks, patient expectations, and the likelihood of continued conservative treatment success.

Timing Considerations and Disease Stage

The optimal timing for silent manipulation remains a subject of clinical judgment, balancing the desire to shorten disease duration against the need to avoid premature intervention. Previous reports recommend a minimum of 3 to 6 months of failed conservative treatment before considering manipulation [15-17]. However, the indication for silent manipulation is not determined by completing a fixed duration of conservative treatment. Rather, when capsular contracture can be confirmed with certainty, that itself constitutes the indication for silent manipulation, and the procedure should be performed at that time.

From a pathophysiologic perspective, manipulation is most appropriate during the "freezing" and early "frozen" stages, when active capsular inflammation and fibrosis dominate the clinical picture but before secondary complications such as profound muscle atrophy or shoulder girdle stiffness become established. Intervention during the late "frozen" stage, when pain has diminished, but stiffness remains severe, can still be highly effective.

Contraindications and Special Precautions

Careful patient selection is critical to minimize complications and ensure safe performance of silent manipulation. Contraindications are classified as absolute or relative based on the severity of risk.

Absolute contraindications to silent manipulation include acute infection in or around the shoulder, acute fracture, and patient's unwillingness or inability to cooperate with the awake procedure.

Relative contraindications include severe osteoporosis with high fracture risk, neurologic disorders affecting the affected extremity, uncontrolled diabetes mellitus, significant glenohumeral osteoarthritis, and significant medical comorbidities that increase anesthetic risks. While silent manipulation can be performed in patients with these conditions, careful risk-benefit assessment and enhanced precautions are warranted. Severe osteoporosis deserves particular attention due to increased fracture risk during forceful manipulation.

Post-fracture frozen shoulder—particularly following proximal humerus fractures involving the greater tuberosity or surgical neck—is not an absolute contraindication to silent manipulation, but specific precautions apply. First, a complete bony union must be confirmed radiographically before attempting manipulation. Second, malunion or retained hardware may alter normal biomechanics and create stress concentration points where fracture risk is elevated. Third, the approach must prioritize safety above all else, with lower force application and heightened vigilance for abnormal resistance or patient discomfort. If adequate ROM improvement cannot be achieved safely, the procedure should be terminated.

Thorough pre-procedure imaging evaluation with radiographs and MRI is essential in all cases to identify structural pathology that would contraindicate forceful manipulation. For example, large bone cysts extending from the humeral head to the proximal shaft significantly reduce bone strength and markedly increase fracture risk during manipulation. Such lesions must be identified and considered absolute contraindications unless surgically addressed before manipulation.

Respiratory considerations constitute another critical domain for contraindication assessment. Because the interscalene brachial plexus block invariably causes ipsilateral phrenic nerve palsy with hemidiaphragmatic paralysis, patients with pre-existing respiratory insufficiency face a significant risk of clinically meaningful respiratory compromise. Similarly, patients who have undergone partial or complete pneumonectomy on the contralateral side—leaving only one functional lung—are at high risk for severe respiratory distress when ipsilateral hemidiaphragmatic function is lost due to phrenic nerve blockade. In such patients, silent manipulation is generally contraindicated due to the unacceptable risk of life-threatening respiratory failure. If manipulation is deemed necessary in patients with borderline respiratory function, consultation with anesthesiology, availability of advanced airway management, and possible consideration of alternative anesthetic techniques should be arranged.

Management of LAST

Silent manipulation requires relatively large volumes of local anesthetic for cervical nerve root block, creating potential risk for LAST. Although rare with proper technique, LAST represents a potentially life-threatening complication requiring immediate recognition and treatment.

LAST occurs when a local anesthetic enters the systemic circulation in sufficient quantity to produce toxic effects on the central nervous system and cardiovascular system. This can result from inadvertent intravascular injection, rapid absorption, or accumulation from repeated dosing [54,55].

Clinical manifestations progress in a dose-dependent manner. Early central nervous system symptoms include perioral numbness, metallic taste, tinnitus, dizziness, confusion, or paradoxical euphoria resembling intoxication. Progressive toxicity causes muscle twitching, tremors, and seizures. Cardiovascular toxicity manifests as initial hypertension and tachycardia, followed by hypotension, bradycardia, arrhythmias, and ultimately cardiovascular collapse [56].

Immediate management follows a structured approach. At the first sign of toxicity, stop local anesthetic administration immediately. Secure the airway, provide supplemental oxygen, and support ventilation. Treat seizures with benzodiazepines. Administer 20% lipid emulsion as the definitive antidote: initial bolus of 1.5 mL/kg over 1 minute, followed by continuous infusion at 0.25 mL/kg/min. Repeat bolus up to two times at 5-minute intervals if cardiovascular instability persists. Continue infusion for at least 10 minutes after achieving circulatory stability.

Lipid emulsion (20% Intralipid) must be immediately available in the procedure room before beginning any silent manipulation (Figure 9). The calculated bolus dose should be drawn up in advance. All staff must be familiar with LAST recognition and management. Emergency equipment, including airway management supplies, resuscitation medications, and a defibrillator must be immediately accessible.

The Philosophy of "Silent" Manipulation

The Birth of Silent Manipulation

Silent manipulation originated through the collaboration of two pioneering clinicians whose complementary expertise transformed frozen shoulder treatment.

The technique was developed by Dr. Park Kieun, an anesthesiologist and pain clinician at Park Pain Clinic. While observing shoulder manipulation procedures performed under general anesthesia in the operating room, Dr. Park recognized that the procedure could be performed under regional nerve block rather than general anesthesia. He successfully implemented manipulation under conduction anesthesia, though his initial technique focused primarily on capsular release through forward elevation movements.

Figure 9. 20% Lipid Emulsion for Local Anesthetic Systemic Toxicity (LAST)

20% lipid emulsion (intralipid) prepared and immediately available in the procedure room for emergency treatment of LAST.

Dr. Park's innovative approach came to the attention of Dr. Hiroshi Minagawa, a shoulder surgeon at Joto Orthopedic Clinic and one of the pioneers of musculoskeletal ultrasound in Japan and Asia. Learning the technique from Dr. Park, Dr. Minagawa refined it into a comprehensive method, achieving complete 360° circumferential capsular release through systematic manipulation in multiple planes of motion.

The Philosophy Behind the Name

Dr. Minagawa coined the term "silent manipulation" based on his experience during training in Europe, where he observed shoulder MUA in operating rooms. He was struck by the aggressive nature of those procedures and the loud, audible sounds produced during capsular disruption, so forceful that some cases resulted in fractures. In contrast, his refined technique emphasized controlled, meticulous manipulation, producing relatively minimal audible disruption. The term "silent" embodies a distinctly Japanese philosophy of craftsmanship—valuing precision, control, and refined technique over brute force. This naming choice reflects pride in careful, skilled work that achieves therapeutic goals through finesse rather than aggression.

The name proved remarkably prescient. Its memorable quality contributed significantly to rapid adoption throughout Japan and growing international recognition. While more descriptive terms such as "awake shoulder manipulation" or "shoulder manipulation under nerve block" might be academically precise, they lack the conceptual elegance that made "silent manipulation" immediately recognizable and appealing to both practitioners and patients.

Evolution and Dissemination

Following the foundational work of Drs. Park and Minagawa, the next generation of practitioners, expanded the technique's reach. Dr. Kazuma Miyatake emerged as a dedicated advocate, contributing through educational efforts, publication of clinical studies, and training of new practitioners [23,53]. His scholarly work solidified the evidence base and facilitated acceptance within mainstream orthopedic practice in Japan.

The Japanese Shoulder Society has discussed standardizing terminology for academic contexts, potentially adopting designations such as "awake shoul-

der manipulation" or "shoulder manipulation under nerve block" in formal publications. However, in clinical practice and common usage, "silent manipulation" will likely endure, capturing both the technical distinctiveness and philosophical foundations of this valuable treatment approach.

Summary

Silent manipulation combines ultrasound-guided cervical nerve root block with systematic shoulder manipulation while the patient remains awake, offering rapid and effective treatment for refractory frozen shoulder. Evidence from Japanese studies demonstrates substantial improvements in ROM and function within one week, sustained long-term, with a favorable safety profile compared to MUA. Success requires meticulous patient selection, precise nerve block technique, comprehensive capsular release, and structured rehabilitation with rotator cuff re-education. Silent manipulation provides a safe, cost-effective alternative that can resolve in weeks what conservative management might require years to achieve.

Acknowledgments

I extend my deepest gratitude to the pioneers and mentors who have shaped my understanding and practice of silent manipulation.

Dr. Hiroshi Minagawa: Dr. Minagawa first introduced me to silent manipulation through his lecture, revealing not only the existence of this technique but also its dramatic efficacy and the profound relief it brings to patients suffering from frozen shoulders. He graciously welcomed me to his clinic for clinical observation, where I witnessed silent manipulation firsthand. Beyond this technique, Dr. Minagawa has been my mentor in musculoskeletal ultrasound since the beginning of my journey, providing warm and continuous guidance over the years. I am truly grateful for his teaching and inspiration.

Dr. Kieun Park: As the original developer of silent manipulation, Dr. Park exemplifies a commitment to continuous improvement, constantly refining the technique to achieve better outcomes. His willingness to share technical tips and nuances has directly elevated the skill level of practitioners, including myself, across the field. Moreover, his dedication to documenting the outcomes of his vast clinical experience in peer-reviewed publications reflects the integrity of a true scientist [51,52]. I deeply respect and appreciate his contributions to advancing the evidence base for silent manipulation.

Dr. Kazuma Miyatake: Dr. Miyatake represents the next generation of pioneers, following Drs. Minagawa and Park. He continuously generates and disseminates new insights, inspiring me to keep pace and pushing me to reach higher levels of clinical excellence. His original anterior approach for shoulder injection prior to silent manipulation—developed from his extensive experience as a shoulder surgeon performing numerous arthroscopic capsular releases—is a testament to his innovation. I am deeply grateful for his generosity in allowing me to include his injection technique in this review.

Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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