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Communication

Treatment Strategy for Shoulder Periarthritis in Painful Phase and Frozen Phase

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Abstract

Scapulohumeral periarthritis, more commonly known as “frozen shoulder (FS)”, is a painful shoulder condition with significant decrease of active and passive range of motion. The illness progresses through three phases: freezing (painful phase), frozen and thawing. The goal of any treatment is to reduce pain and restore shoulder movement. oral anti-inflammatory and analgesic medications and steroid injections in trigger point has been successful in improving pain relief, reducing disability, and increasing range of motion in subjects with stage 1 and 2 periarthritis. Nonsteroidal anti-inflammatory and analgesic medications should be administered throughout whole treatment process. COX-2 inhibitors such as Etoricoxib and Celecoxib should be first chosen. Manipulation under anesthesia (MUA) should be performed during the frozen phase. MUA is performed under brachial plexus anesthesia or intravenous general anesthesia. SSNB (suprascapular nerve block) is superior to IACI (intra-articular corticosteroid injections) for FS. The use of steroids is limited to inject at trigger points, and the dosage should not be excessive to reduce side effects. ACR (Arthroscopic capsular release) has now replaced open surgery with joint capsule release. ACR is a relatively new technique that allows partial or complete release of the joint capsule under arthroscopic visualization. ACR should be performed for refractory or recurrence FS after MUA during the frozen phase. Only when the inflammation around the shoulder is suppressed by oral administration of nonsteroidal anti-inflammatory and analgesic drugs and injection of targeted corticosteroids, shoulder exercises will be effective.

Keywords

Scapulohumeral Periarthritis, Frozen Shoulder, Manipulation Under Anesthesia Arthroscopic Capsular Release, Shoulder Pain

1. Introduction

Periarthritis, also known as Adhesive capsulitis, usually referred to as Frozen Shoulder (FS) is a condition characterized by inflammation of the glenohumeral joint capsule, leading to fibrosis and resulting in functional disability and reduced quality of life [1]. It is characterized by shoulder joint pain and significant decrease of active and passive range of motion (ROM) of the glenohumeral joint. Although periarthritis is a self-limiting and benign disease, 50% of patients without standardized treatment still suffer from pain or stiffness of the shoulder at a mean of 7 years from the onset of the disease [2]. At present, although there are many treatment methods for shoulder periarthritis, the efficacy is not satisfactory for patients. optimal treatment is unclear. Therefore, the key management strategy is early treatment and standardized treatment to relieve pain and avoid sequelae.

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2. Treatment in the Painful Phase

These initial conservative managements may be successful in up to 90% of patients in this phase, so it should be the first choice. Conservative treatments include oral medication, steroid injection and physical therapy.

2.1. Oral Medications

Periarthritis is an inflammatory reaction in the shoulder capsule and surrounding ligaments. The first phase, known as the painful phase, is characterized by gradually worsening shoulder pain, so use of anti-inflammatory analgesics such as non-steroidal anti-inflammatory drugs (NSAIDs) should be regarded as first choice in this phase. Early use of NSAIDs during the painful phase can lead to complete recovery and prevent progression to the frozen phase. Other treatment methods should be based on the use of NSAIDs during the frozen phase. Some outpatients complain that analgesic is ineffective, and some literatures also report that the use of NSAIDs is also ineffective [2-4]. However, based on my clinical experience, the decreased pain appears gradually after taking medicine for 10 days during the painful phase, and the pain completely disappeared after taking medicine for 20 to 30 days. Because there were still shoulder pain after taking the medicine for 8 to 10 days, some patients considered it is ineffective and give up taking the medicine. Therefore, NSAIDs should be taken for a sufficient duration during the painful phase.

The selection of oral medications is very important. According to our experiences, COX-2 inhibitors such as Etoricoxib and Celecoxib should be chosen. These medications have strong anti-inflammatory effects but only minimal irritation to the gastrointestinal tract, it is easy for patients to accept. No matter any kind of treatment is carried out during the frozen phase, NSAIDs should be taken throughout the whole phase, because the elimination of inflammation around the shoulder is a prerequisite for other treatments. Without this prerequisites, even if other treatments are effective, the results will be temporary and easy to relapse. Additionally, literature reports that oral corticosteroids indicates effectiveness [2]. Of course, corticosteroids have much stronger anti-inflammatory effects than NSAIDs, but oral administration for long-term brings significant side effects, should not be underestimated also. We do not recommend the oral corticosteroids, On the contrary, we recommend injecting corticosteroid at trigger point.

2.2. Corticosteroid Injection at Trigger Point

Corticosteroid injections at trigger point are an effective method with proven efficacy for periarthritis. The early use at trigger point injection during the painful phase not only eliminates the severe pain at night, but also blocks the development to the frozen phase, avoiding the trouble of the pain in the frozen phase and the fussy intervention due to the poor curative effect. Therefore, steroid injections at trigger point should be the preferred intervention during the painful phase. The patient with severe shoulder pain, steroid injections can be administered at the trigger point if they consent. The trigger points should include the coracohumeral joint, subacromial space and infraspinatus. The opinion that the efficacy of steroid injections is unrelated to the injection sites [2] seems inappropriate, which may be due to inaccuracies at trigger point selection. A mixture of dexamethasone palmitate (or dexamethasone plus lidocaine) can be used. Some paper reports that triamcinolone acetonide have been used [5]. Granular corticosteroids are prone to cause tendon damage, while triamcinolone can lead to subcutaneous tissue contracture and skin whitening at the injection sites, which should be abandoned in our opinion. The trigger point injection is better every 1 to 2 weeks, and the second injection should be at the remaining trigger points.

There are currently various opinions about intra-articular or extra articular injection. Although expert consensus consider that intra-articular corticosteroid injection (IACIs) is effectivc during the early phase [6], a combination of ultrasound-guided IACIs and physiotherapy should be attempted first as a FS treatment [7, 1], intra-articular injections are less effective and should be avoided in my opinion. There was no significant difference between trasound-guided injection of posterior intra-articular injection and anterior extra-articular injection concerning pain, ROM, and functional scores [8]. Kayaokay et al. [9] studied 2 groups of FS paitients, who underwent Manipulation under anesthesia (MUA) were determined as group 1 and those who received intra-articular corticosteroids in addition to MUA were determined as group 2. The results indicate there was no significant difference between the ROM in the two groups after manipulation and physiotherapy. Compared to the control group, only flexion of the patients treated with PRP (platelet-rich plasma) demonstrated no significant improvement at 1 month, whereas internal rotation, flexion, external rotation and abduction of the shoulder were found to be improved following 3 months of treatment. Similar research results from other scholars are similar.[10, 11]. Vita et al. [12] discovered that Ultrasound-assisted hydrodistention of the glenohumeral joint combined with targeted exercises has been successful in improving pain relief, reducing disability, and increasing range of motion in subjects with stages 1 and 2 FS. In particular, patients diagnosed with stage 1 FS have better short-term results and faster recovery of full shoulder mobility, do not require numerous infiltrations and achieve clinical improvement in less time. Liu et al. [13] considered that SSNB (suprascapular nerve block) is superior to IACI for FS based on a meta-analysis. SSNB is even superior in early efficacy. The shoulder joint capsule inflammation is the pathological basis of shoulder periarthritis, and the target of treatment should be around the shoulder joint, so the efficacy of intra-articular injection of corticosteroids or PRP is uncertain.

2.3. Physiotherapy

Physiotherapy as a primary treatment is widely used for shoulder diseases. It includes massage therapy, acupuncture, moxibustion, and infrared thermotherapy, serve as an important auxiliary means in the treatment of periarthritis. The combination of acupuncture and physical therapy is more effective than physical therapy alone in managing pain, improving clinical effective rates, and enhancing range of motion in patients with FS [14]. It should be noted that physiotherapy alone hardly produces satisfactory results; however, the efficacy of physiotherapy combined with oral NSAIDs and steroid injections at trigger points can be significantly enhanced.

3. Treatment in the Frozen Phase

In china, the periarthritis in frozen phase is called frozen shoulder (FS). In frozen phase, oral medication and trigger point injections often show poor results. Surgical treatment is recommended as the first option, including manual release and arthroscopic release. FS is suitable for surgical treatment while conservative treatment is ineffective in frozen phase, there is no need for a rigid waiting period of 3 to 6 months.

3.1. Manipulation Under Anesthesia (MUA)

FS manual manipulation must be performed under anesthesia and must never be carried out violently without anesthesia. This concept must be firmly established. After anesthesia, the pain-induced-resistance of the shoulder muscles is eliminated, the damage is minimal during this time. There was a patient who underwent violent manipulation, leading to extensive bruising and swelling in the shoulder and chest muscles, causing unbearable pain in my clinic. This case left me a lifelong impression. MUA typically takes less than 5 minutes, so intravenous general anesthesia is often chosen. Its advantage is quick recovery, but the disadvantage is severe shoulder pain after waking, so patients need to use analgesics subsequently. Our hospital often uses an intravenous pump of fentanyl analgesic, the pump is removed after 2 days. Interscalene brachial plexus block can also be chosen, because cervical plexus nerve to be blocked, which provides very thorough anesthesia and reduces subsequent pain.

SSNB is promising outcomes compared to intra-articular steroid injection or physiotherapy based on level I evidence. It can therefore be considered as a first-line treatment option. SSNB can be administered in the outpatient clinic [15]. Silent manipulation is a procedure for FS that involves manipulating the shoulder while the patient is awake by performing C5, C6, and C7 cervical nerve root block under ultrasound guidance [16]. If practitioner is skilled professionals, the Silent manipulation may be performanced. After manipulation, patients should continue taking NSAIDs. If shoulder pain persists, steroid injections can be administered at the trigger points. The shoulder joint should be kept active regular exercises to prevent frozen again. MUA is a simple and effective method for treating FS and is not difficult to perform in pain department.

3.2. Arthroscopic Capsular Release (ACR)

ACR has now replaced open surgery with joint capsule release [2, 5] ACR is a relatively new technique that allows partial or complete release of the joint capsule under arthroscopic visualization. There are various surgical approaches, but ACR most involves releasing the rotator cuff interval, coracohumeral ligament, and supraspinous fibers of the subscapularis. When conservative treatments are inadequate, surgical intervention, particularly arthroscopic capsular release, offers a valuable option for those with persistent symptoms. Although effective, surgical procedures require careful patient selection and postoperative rehabilitation to ensure optimal outcomes and prevent recurrence of stiffness [17]. For patients who experience recurrence after manual release, ACR can be performed. During the procedure, axillary nerve must avoid damaging. ACR provides precise release at the lesion site, often combined with corticosteroid injection in the affected area, ensuring definite therapeutic effects. It is currently the best surgical option for treating frozen shoulder.

It should be noted that some patients may refuse surgery due to fear of operation. In such cases, NSAIDs can be taken along with shoulder stretching exercises at home, which can significantly alleviate FS symptoms and even lead to complete recovery. Therefore, surgical release during the frozen phase is not the unique treatment option available.

4. Treatment Strategy for Periarthritis

The objective is pain relief and active and passive ROM recovery of the shoulder in a short term. The treatment plan should be formulated according to the phase of the condition.

1) Painful phase: Oral NSAIDs and steroid injections at trigger points are primarily used to eliminate inflammation and quickly relieve pain. The duration of medication should be sufficient for primary periarthritis, This management can terminate its further progression. If there are trigger points around the shoulder, steroid injections at trigger points should be administered.
2) Frozen phase: It is the aim to restore ROM of the shoulder. If physiotherapy is ineffective, MUA is likely to perform first. If “frozen” occurs again, ACR is to perform. NSAIDs should be continuously administered during this phase. If shoulder pain persists, steroid injections at trigger points should be performed. During this phase, patients should begin progressive ROM exercises as soon as possible, such as shoulder stretching exercises to prevent recurrence.
3) The use of steroids is limited to inject at trigger points, and the dosage should not be excessive to reduce side effects. Generally, no more than 2 times injections

should be given, because it can cause tears and damage to the shoulder ligaments for multiple injections.

4) Physiotherapy or self-exercise must be conducted under the premise of using NSAIDs or steroid injections at trigger points. Only when the inflammation around the shoulder is suppressed, shoulder exercises will be effective. Blind exercise will exacerbate shoulder pain and stiffness. This principle should be fully understood by patients to facilitate cooperation between doctors and patients in jointly combating this disease.

Author Contributions

Xiao Wen Wang is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declared no conflicts of interest with respect to the authorship and/or publication of this article.

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