

In The Name Of God

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**Comparative efficacy of physiotherapy and intra-articular
corticosteroid injection in the management of frozen shoulder in
patients attending to hospitals of Azad University during 2006-2007**

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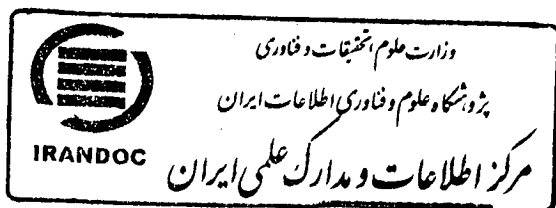
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I offer this thesis to
My Dear
Mother & Father

**I, also offer this thesis
to my dear master,
Dr. Akhlaghnejat
because of his advices
on my project.**

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Comparative efficacy of physiotherapy and intra-articular corticosteroid injection in the management of frozen shoulder in patients attending to hospitals of Azad University during 2006-2007

The study was a clinical trial to compare the outcome at 4th and 8th weeks with two different modalities in the treatment of 'Frozen shoulder'. Thirty clinical cases with painful limitation of movement of shoulder were consecutively selected to receive physical therapies versus intra-articular steroid. Physical Therapies provided to all patients were therapeutic exercises, transcutaneous electrical nerve stimulation (TENS) and infra-red radiation (IRR). Outcome measures were improvement of pain on a Visual Analogue Scale (VAS) score and range of motion measured by Goniometer at 4th and 8th weeks. The baseline range of motion in the two groups was comparable. At 4th and 8th weeks statistically significant differences in VAS weren't observed in the two groups ($p > 0.05$). Also the pain reduction on VAS score was not significant in the two groups ($p > 0.05$). The intra-articular steroid was more effective than physical therapy in the functional improvement of the frozen shoulder. However, the difference wasn't statistically significant ($p > 0.05$). It's concluded that these two different modalities were comparable in the treatment of 'Frozen shoulder'.

Key Words: Frozen shoulder, Corticosteroid, Physiotherapy

Introduction

The terms adhesive capsulitis and frozen shoulder syndrome (FSS) have been used to describe an array of clinical conditions, including subacromial bursitis, calcifying tendinitis, and partial rotator cuff tears. Despite the diverse nomenclature used to describe FSS, all of these terms denote different clinical conditions that may cause the painful restriction of active and passive glenohumeral and periscapular shoulder motion.

Lundberg divided patients who met the pain and motion requirements of frozen shoulder into 2 groups: primary and secondary. A patient meets the criteria of primary or secondary FSS if painful, restricted active and passive glenohumeral and scapulothoracic motion occurs for at least 1-month duration and has either reached a plateau or worsened. This inclusion period for defining frozen shoulder is similar to that described by Binder and colleagues but is shorter than that defined by Lloyd-Roberts and coworkers.

Patients with primary frozen shoulder have no significant findings in the history, clinical examination, or radiographic evaluation to explain their motion loss and pain. Classically, symptoms of primary frozen shoulder have been divided into 3 phases: (1) the painful phase, (2) the stiffening phase, and (3) the thawing phase. In the initial painful phase, there is a gradual onset of diffuse shoulder pain lasting from weeks to months. The stiffening phase is characterized by a progressive loss of motion that may last up to 1 year. Most patients lose glenohumeral external rotation, internal rotation, and abduction during this phase. The final, thawing phase is measured in weeks to months and constitutes a period of gradual motion improvement. Once in this phase, the patient may require up to 9 months to regain a functional range of motion (ROM).

In contrast to patients with primary FSS, patients with secondary FSS describe an event that preceded shoulder symptomatology, such as trauma or surgery to the affected upper extremity. However the best definite therapeutic modality is remained not clear, so far. To address these

important issues, we designed this clinical trial to evaluate and compare the efficacy of physiotherapy and intra-articular corticosteroid injection in the management of frozen shoulder in patients attending to hospitals of Azad University during 2006-2007.

Review of Literatures

Problem

Codman originally coined the term frozen shoulder to describe a condition with signs and symptoms that include slow-onset shoulder pain, localized discomfort near the deltoid insertion, an inability to sleep on the affected side, restricted glenohumeral elevation and external rotation, and a normal radiologic appearance. The inclusion criteria for FSS include painful restriction of active and passive glenohumeral and/or periscapular motion. Despite these criteria, diagnosing FSS can be controversial because there is little consensus on specific shoulder motion restrictions or duration of symptoms needed to qualify a patient as having a frozen shoulder. Although various authors have classified patients with FSS as those with limited abduction from 45-135°, it is still primarily a clinical diagnosis based on clinical motion loss and symptoms.

Frequency

FSS usually affects patients aged 40-70 years. Incidence of FSS is not precisely known; however, it is estimated that 3% of people develop the disease over their lifetime. Males tend to be affected less frequently than females, and there is no predilection for race.

Adhesive capsulitis has been associated with several conditions. A higher incidence of frozen shoulder exists among patients with diabetes (10-20%) compared with the general population (2-5%). Incidence among patients with insulin-dependent diabetes is even higher (36%), with an increased frequency of bilateral shoulder involvement.

Etiology

Duplay was one of the first physicians to present the concept of periarticular tissue pathology rather than periarticular arthritis as the cause of frozen shoulder. Despite a lack of evidence linking frozen shoulder to a specific etiology, various triggers that may predispose patients to this

problem appear to exist. A few reported etiologic agents include the following:

- Trauma
- Surgery (including but not limited to shoulder surgery)
- Inflammatory disease
- Diabetes
- Regional conditions
- Various shoulder maladies

In addition, an autoimmune theory has been postulated, with elevated levels of C-reactive protein and an increased incidence of HLA-B27 histocompatibility antigen reported in patients with frozen shoulder versus controls. DePalma proposed that muscular inactivity was a major etiologic factor, while Bridgman identified an increased incidence of FSS in patients with diabetes mellitus. Finally, frozen shoulder also has been associated with cervical disease, hyperthyroidism, and ischemic heart disease.

Most patients with FSS have a period of shoulder immobilization. Reasons for immobilization can be diverse; however, the common finding in all of these patients is a period of restricted shoulder motion. In a study of neurosurgery patients who immobilized their shoulders for varying periods, Bruckner noted an incidence of frozen shoulder that was 5-9 times greater than that found in the general population.

Clinical

Prior to examining the patient, a thorough clinical history should be elicited. Specifically, information should be gathered regarding onset of symptoms, any antecedent trauma or surgery, affected side(s), and duration of symptoms. The patient should be queried about any existing conditions. Since adhesive capsulitis is associated with diabetes, it is imperative to screen any new patient presenting with suggested FSS for diabetes. Adhesive capsulitis has also been reported in patients with hyperthyroidism, ischemic heart disease, and cervical spondylosis. Any previous treatments that the patient has received for this condition should

be documented, as should the individual's current medication list. Questions should be directed toward any upper extremity neurologic complaints, including cervical radiculopathy. Any history of cervical pain or radiculopathy should be thoroughly evaluated during the clinical examination to exclude a diagnosis of cervical spondylosis or cervical disc disease.

The patient's posture should be observed while he or she is wearing a gown and sitting on a stool. It should also be noted whether the patient is listing to one side secondary to pain and whether he or she is holding the neck to one side secondary to spasm or pain. Observations during this period help the physician to determine whether a cervical condition may be contributing to the patient's symptomatology.

INDICATIONS

Refractory shoulder periscapular pain and limited glenohumeral motion that persists despite a period of at least 3 months of attempted

conservative treatment are indications for surgery. The conservative treatment should include the following:

- Physical therapy for ROM of the shoulder
- A course of prednisone
- A subacromial injection at least once but not more than twice within a 3-month period
- A course of anti-inflammatory medication when the patient is not taking prednisone

RELEVANT ANATOMY

Critical to the understanding of FSS is the concept that shoulder function involves not only the glenohumeral joint but also scapulothoracic articulation. Clinicians must understand the essential role that the scapula plays in facilitating glenohumeral motion. Scapulothoracic and glenohumeral motion occur simultaneously following initial arm abduction. With arm abduction in individuals who are healthy,

approximately one third of elevation is attributed to scapulothoracic motion, while two thirds of elevation is provided by glenohumeral motion. The glenohumeral joint is enclosed by the joint capsule and is surrounded by 2 sleeves of muscles. The capsule normally is a loose structure with a surface area nearly twice as large as that of the humeral head. The rotator cuff tendons adjacent to the joint capsule thicken the capsule anteriorly, posteriorly, and superiorly, while the glenohumeral ligaments represent further areas of joint capsule thickening.

Histologically, the capsule consists of bundles of type I collagen. Synovial cells line the inner surface of the capsule and enclose the long head of the biceps tendon.

CONTRAINDICATIONS

Contraindications to surgical intervention for recalcitrant frozen shoulder include the following:

- Concomitant neurologic complaints or abnormalities originating from the cervical spine
- An inadequate trial of conservative therapy (<3 mo)
- Ongoing infection of any type
- Isolated capsular release in the face of adhesive capsulitis and concomitant glenohumeral arthritis (In this situation, capsular release or lengthening should be performed in conjunction with total shoulder arthroplasty.)
- Ongoing oncologic process involving the affected shoulder

WORKUP

Lab Studies

- Laboratory studies rarely are required for the evaluation of adhesive capsulitis. However, if a predisposing medical condition that may be contributing to adhesive capsulitis is suggested, the following tests may be ordered:

- CBC
 - Erythrocyte sedimentation rate (ESR)
 - C-reactive protein
 - Serum blood sugar
 - Thyroid stimulating hormone (TSH)
 - Free thyroxine index (FTI)
- Although an orthopedic surgeon may order these tests, results should be forwarded to the patient's internist for further evaluation.

Imaging Studies

- Routine radiographs of the shoulder should be obtained in all cases to rule out any pathologic process. These radiographs should include the anteroposterior (AP) view of the glenohumeral joint in neutral rotation, the supraspinatus outlet view, and the axillary lateral view (if possible).
- Magnetic resonance imaging (MRI) is not initially indicated in cases of adhesive capsulitis. Due to the global pain associated with frozen

shoulder, MRI is an expensive and nonspecific test. However, if the patient does not improve after a period of time (6 wk to 3 mo), then MRI is appropriate to rule out a possible rotator cuff tear or intra-articular pathology.

Histologic Findings

Many patients with adhesive capsulitis demonstrate arthroscopic evidence of proliferative synovitis, capsular and intra-articular subscapularis tendon thickening, and fibrosis and chronic inflammatory cells. The majority of significant synovitis is noted, although it is not limited to the anterior capsule. In addition, most patients demonstrate significant subacromial fibrosis. In one study, the author noted that approximately 40% of patients had significant subacromial fibrosis, regardless of preoperative etiology.