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The Effects of Tissue Flossing on Shoulder Range of Motion and Pain in Patients with Adhesive Capsulitis: A Case Study

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Abstract

Background and Purpose: The purpose of this case report is to describe the tissue flossing interventions for a patient with adhesive capsulitis.

Case Description: The patient was a 56-year-old female, who presented with left shoulder pain and limited range of motion (ROM) following a fall 9 months prior. The patient had a past medical history of thyroid. The diagnosis of adhesive capsulitis was determined following radiographs, mechanism of injury, past medical history, and physical therapy examination and evaluation.

Intervention: The patient was seen for a total of 15 physical therapy sessions over the span of 6 weeks. Interventions included a tissue flossing, home exercise program, instruction in heat/ice use, mobilizations, therapeutic exercises, ROM, stretching, and glides. Outcome measures included ROM measurements, pain ratings, strength tests and the Shoulder Pain and Disability Index (SPADI).

Outcomes: Following 6 weeks of physical therapy intervention, tissue flossing and home exercise program, the patient demonstrated increased shoulder ROM, decreased pain and improved function based on the improved SPADI.

Discussion: Rationale for treatment was based on textbook information for shoulder interventions and research articles. The treatment was altered based on patient's response.

Conclusion: This case report is in concordance with the current research that shows flossing, strengthening, mobilizations, a home exercise program and stretching are appropriate combinations of interventions for individuals with adhesive capsulitis. This patient returned to his prior level of function following the above treatment regimen.

Keywords: *Tissue flossing, shoulder joint, adhesive capsulitis, range of motion.*

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Background and Purpose

Adhesive capsulitis is also named as frozen shoulder, stiff painful shoulder, periarthritis shoulder or frozen shoulder. Name itself says that shoulder capsule become stiff, painful and thick which don't let the shoulder joint move. It frozen in its position.[1] It affects 2-5% of the

population. Adhesive capsulitis used to denote a limitation of shoulder motion without abnormalities of the joint surface, fracture or dislocation.[1] The onset of frozen shoulder is usually gradual and idiopathic. The disease occurs mainly in middle aged individuals and is usually self-limiting but the duration and severity may vary greatly.[3]

Individuals with adhesive capsulitis generally progress through 4 stages: Pre freezing (1-3 months), Freezing (3-9 months), Frozen (9-14 months), and Thawing (12-14 months). Interventions for adhesive capsulitis can include physical therapy, tissue flossing, capsulitis[2] Strengthening of the rotator cuff muscles can restore proper alignment which can decrease pain and improve movement strategies of the shoulder.[3]

Symptoms of frozen shoulder are divided into three stages: The "freezing" stage In this stage, the shoulder becomes stiff and is painful to move. The pain slowly increases. It may worsen at night. Inability to move the shoulder increases. This stage lasts 6 weeks to 9 months. The "frozen" stage In this stage, pain may lessen, but the shoulder remains stiff. This makes it more difficult to complete daily tasks and activities. This stage lasts 2 to 6 months. The "thawing" (recovery) stage In this stage, pain lessens, and ability to move the shoulder slowly improves. Full or near full recovery occurs as normal strength and motion return. The stage lasts 6 months to 2 years.[4]

The treatment and prognosis of adhesive capsulitis is an adequate and based largely individual practice experience rather than randomized controlled clinical trials. Initial treatment is aimed at reducing inflammation and increasing range of motion. Thus analgesic and anti-inflammatory drugs are commonly used. Most type of treatment focus primarily on restoration of mobility.[6] Although physical therapies such as massage, heat application, ultrasound, interferential treatment, osteopathic, chiropractic techniques and stretching and isometric exercise therapy are routinely prescribed, the efficacy is variable.[5]

Therapy includes manual therapy; ROM exercises, specific stretching and strengthening exercises and aerobic program and modalities are available such as interferential therapy, ultrasound, and hot therapy.[7] There is no doubt that physiotherapy treatment is promising and cost effective treatment option and aimed at relieving the pressure on nerves causing the inflammation and pain. This present study is done on patient diagnosed frozen shoulder with a physiotherapy treatment protocol.[7]

Case Description

Assessment

Name: Madhu

Age/gender: 56yrs/female

Occupation: housewife

Address: Karol Bagh Delhi

Chief Complaint: patients complaints that she is having pain over shoulder joint when she is moving her left shoulder, restricted range and she is not able to do daily activities especially overhead activities.

History:

Present History

Date of onset of symptoms: from last 6 months

Condition: worsening

Muscular weakness: over deltoid region

Pain History

Duration of symptoms: Every time while moving shoulder.

Type of pain: stabbing.

Aggravating and Relieving factors: While moving shoulder &relieving while resting.

Past History: No history of Tuberculosis, Bronchial Asthma, Blood Pressure, Diabetes, Cardiac Problems. Only hyperthyroidism history.

No accidental injury is recorded.

Family history: No genetic issues recorded.

Personal history: No personal history of tobacco and other alcohol consumption.

On Observation

Wasting: No

Edema: No

On Palpation:

Tenderness: grade 3

Tissue Texture: somewhere pale and somewhere black spots

Temperature variation of skin local skin cool

Spasm: Rhomboids, supraspinatus, pectoral major, deltoid ant. Fiber

Type of skin: Dry

On Examination

Motor examination

Range of motion

SIDE	FLEXION	EXTENSION	ABDUCTION	ADDUCTION	EXTERNAL ROTATION	INTERNAL ROTATION
LEFT	90	10	60	10	20	5
RIGHT	170	55	150	25	80	80

Manual muscle testing

SIDE	FLEXION	EXTENSION	ABDUCTION	ADDUCTION	EXTERTNAL ROTATION	INTERNAL ROTATION
LEFT	4	4+	4	4+	4+	3+
RIGHT	5	5	5	5	5	5

Special Tests:

SNO	TEST	RIGHT	LEFT
1.	SHOULDER SHRUG SIGN	NEGATIVE	POSITIVE
2.	YERGASON TEST	NEGATIVE	POSITIVE

VAS/NRS scale : 7/10

Investigations:

MRI: shows that altered signal in rotator interval appearing hyperintense and changes in the tendinosis is seen in the intra articular part of biceps tendon and supraspinatus tendon.

Fig: MRI scans films.

Differential diagnosis:

Biceps tendinopathy

Glenohumeral osteoarthritis

rotator cuff tendinopathy or tear

subdeltoid bursitis

Final Diagnosis: Adhesive Capsulitis.

Goals:

Short term: To decreases the pain

To increase the range of motion of the joint

To reduces stiffness.

Long term goals: To strengthen the muscle

To reeducate the muscle

To maintain endurance.

Management:

The protocol is as follows

Physiotherapy Management (15 Sessions Were Given)

First 2 sessions.

- Hot packs for 15 minutes so as to relax the muscles around shoulder complex.
- Ultrasonic therapy: 0.8 watts with 1 MHz frequency probe for 10 minutes for breaking the adhesions as well as relieving pain.
- Shoulder joint capsule stretching (4 times) were done according to Dutton's Orthopaedic Examination.
- GH Caudal glides (4sets of 10 rep. each), was performed as described by Johnson et al
- GH Posterior glides (4 sets of 10 rep. each), was performed as described by Johnson et al6
- Long axis traction of glenohumeral joint (5 mins)
- Passive movements

Dynamic cupping on supraspinatus, infraspinatus, teres and deltoid .

- Finger ladder exercise
- Shoulder wheel exercise for 15 minutes
- Home regime
- Hot water fomentation
- Pendular exercises
- Wall finger climbing exercises
- Self assisted exercise.

3&4th session

Exercises are same while number of repetitions is increased

Tissue flossing for deltoid anterior fiber 2 minutes

- Shoulder joint capsule stretching (6 times)
- GH Caudal glides (6 sets of 10 rep. each till end range), was performed as described by Johnson et al
- GH Posterior glides (6 sets of 10 rep. each till end range), was performed as described by Johnson et al
- Long axis traction of glenohumeral joint (7 times) were done according to Dutton's Orthopaedic Examination, Evaluation, and Jnte/Vention.
- Hold relax exercises with 1+1/2 kg weight (7 repts)
- Resisted exercises in available range are added (10 repts)
- Taping for middle deltoid.[9]

Fig: Rom before tissue flossing

Fig: Doing tissue flossing on deltoid muscles.

Session 5th

Exercises are kept same and the numbers of repetitions are increased.

- Hold relax exercise with 2kg weight cuff (10 repts)
- Tissue and joint flossing of scapulothoracic joint

Hot packs for 15 minutes so as to relax the muscles around shoulder complex.

- Ultrasonic therapy: 0.8 watts with 1 MHz frequency probe for 10 minutes for breaking the adhesions as well as relieving pain.[10]
- Shoulder joint capsule stretching (4 times) were done according to Dutton's Orthopaedic Examination, Evaluation, and Jnte/Vention.
- GH Caudal glides (4sets of 10 rep. each), was performed as described by Johnson et al6
- GH Posterior glides (4 sets of 10 rep. each), was performed as described by Johnson et al6
- Long axis traction of glenohumeral joint (5 mins)
- Passive movements
- Finger ladder exercise
- Shoulder wheel exercise for 15 minutes
- Resisted exercises in available range are added (15 repts)

Session 6-10th

Joint and tissue flossing

Pnf patterns

Weight bearing exercises with 2 kg weight cuff

Theraband stretchings

Caudal glides &TENS & Ultrasound therapy combination therapy 5minutes

Session 11-15th

Joint and tissue flossing

Pnf patterns

Weight bearing exercises with 2 kg weight cuff reps increased.

Theraband stretchings

Caudal glides &TENS & Ultrasound therapy combination therapy 5minutes

Fig: Glide is given to the patient to improve rotational range

Fig: ROM on the last day of treatment.

Procedure

Patient diagnosed case of adhesive capsulitis were randomly included in the study. She was assessed by a fixed assessment protocol prior to the commencement of the study. Subject included who had Painful, restricted active and passive range of motion of the shoulder, symptoms present for at least 6 months, presence of radiological evidence of glenohumeral joint arthritis and had capsular pattern of motion restriction. Procedure is followed 15 minutes hot pack 5 ultrasound, 10 minutes TENS, 05 minutes tissue flossing, 40minutes for other rehabilitation example {glides, stretching, mobilization, ladder, pulley, wheel}.

Outcomes

During the patient's last session, a reassessment was done before discharge. The patient reported She felt She had made 90% improvement since the initial evaluation and reported he was able to lay on his left arm without numbness or pain and was sleeping normally. Now she can able to do above head activities and do all the ADL'S by herself . Patient was consistent with her home exercise program and felt she could independently continue her exercises at home. she reported his pain at 0/10 at the best and 1-2/10 at the worst. The patient demonstrated increased ROM and strength before discharge.

Shoulder range of motion at discharge

	BEFORE	AFTER
FLEXION	90	160
EXTENSION	10	40
ABDUCTION	60	145
ADDUCTION	10	25
INTERNAL ROTATION	5	75
EXTERNAL ROTATION	20	80

Initially the fall efficacy scale was 26 ie. Moderate risk but after few sessions it gradually goes down ie. 16 low concern. Patient meet her all long term goals patient will report pain at worst of 2/10 or less, patient will demonstrate 80 degrees or more of shoulder external rotation without pain in order to manage her coat independently, and patient will demonstrate shoulder abduction strength of 5/5 without pain.

Discussion

Adhesive capsulitis is often diagnosed and managed. This is partially due to a lack of agreement about

definitions and classification of this disorder, confusing terminology and difficulty differentiating it from other conditions.[11] The frozen shoulder is characterized by an unknown etiology, spontaneous and gradual onset of pain and a global restriction of movement in the GH joint due to contractures and loss of compliance of the capsule. While the etiology is typically unknown, there can be a history of minor trauma and occasional significant injury.[12] An important component of successful management of frozen shoulder syndrome is educating patients and informing them about the planned treatment modalities. Objectives of physiotherapy and rehabilitation applications and tissue flossing in patients with adhesive capsulitis are to prevent disability, to increase functional capacity, and to provide pain relief.[23] In this study . The age of patient were 56 year. She suffered from global restriction of movements and pain in the shoulder region and deltoid region . Patients also displayed a feature of nocturnal pain in common. A standardized assessment performa was used to assess the patient.[15]

Case presented with pain and stiffness in left shoulder, global restriction of movements and difficulty in ADL's. VAS score was 7 before treatment and after physiotherapy treatment reduced to 1. Pain reduced and also stiffness in joint was reduced. She was able to activities of daily living.[19]

All the patients were given physiotherapy treatment according to the condition for example tissue flossing, TENS, ultrasound, hot packs, shoulder mobilization, capsule stretching, strengthening exercises for weak muscles and pain relief.[20] Prognosis was found to be very effective after physiotherapy treatment. By doing flossing on regular basis range is improved faster than not doing flossing.[21]

Conclusion

The cases studied shows that physiotherapy plays an important role in treatment of patients suffering from adhesive capsulitis. Various therapeutic techniques like tissue flossing, hot packs, ultrasound, capsular stretches, tissue flossing,TENS, strengthening exercises and home regime have a significant effect in reducing pain, increasing range of motion and stiffness of joint in adhesive capsulitis.[22] Acknowledgement: The authors are thankful to subjects who participated in this study to carry out this work. **Source of Funding:** The work done in the study has not been supported by any funding agency or supported by a grant and it has not been adapted from a conference presentation.[23]

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