International Journal of Medical Science and Clinical Invention 6(5): 4481-4484, 2019
DOI:10.18535/ijmsci/v6i5.10 **ICV 2016: 77.2**
e-ISSN:2348-991X, p-ISSN: 2454-9576

Case Report

Diagnostic Reasoning and Physiotherapy Treatment for A 65 Years Old Female with Left Sided Frozen Shoulder

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Abstract:

Introduction: Frozen shoulder is a self-limiting condition that affects daily activities. Early diagnosis and treatment is essential for better prognosis. Accurate diagnosis largely depends on reasoning skills of physiotherapy practitioners.

Methods: Case study.

Diagnosis and Treatment: In this case, pattern recognition was used as diagnostic reasoning and posterior to anterior and caudal mobilization techniques were applied to decrease pain and improve range of motion. Beside, theraband was used to improve muscle strength of left shoulder.

Results: After application of 12 sessions treatment, patient showed improvements in left shoulder symptoms such as pain at NPR scale by 5 cm, improvement in passive ROMs by 15°, 5°, 20°, 10° and 25° in consequently in flexion, extension, abduction, medial rotation and lateral rotation, improvement in SPDI by 42% and muscle power improved from Grade IV to Grade V in abductors and lateral rotators.

Conclusion: Reasoning process helps physiotherapist for correct diagnosis. However, application of evidence based physiotherapy treatment showed significant improvements in symptoms after frozen shoulder.

Keywords: Diagnostic reasoning, Physiotherapy and Frozen shoulder

Introduction:

Frozen shoulder (FS) is a condition characterized by a painful, gradual loss of passive glenohumeral joint movement. This limitation is resulting from progressive fibrosis and contracture of the glenohumeral joint capsule [1]. However, the exact pathological reasons for FS are still unknown and it is considered as idiopathic type. In contrast, FS shoulder with definite risk factors are known as secondary type of FS.

There are three stages of FS. Stage I (painful stage) is mainly characterized by pain usually lasting 2–9 months. In Stage II (frozen stage) pain gradually subsides but stiffness is marked lasting for 4–12 months. In Stage III (thawing phase) pain resolves and improvement in range of motion (ROM) appears [2].

Case Description

Mrs. X was 65 years old female with right hand dominant housewife. She complained of aching pain at rest and sharp pain during active movement of left shoulder especially during reaching activities and felt difficulties to sleep on the affected side. Pain was also around left shoulder and often radiates to elbow. For these problems, patient was thought a case of supraspinatus tendinitis and patient received medication as well as electrotherapy for 12 days; 4 sessions per week of totaling 3 weeks as per physician's advice. Patient was not improving and was referred to me for my consultation. During assessment, patient's chief complains were left shoulder pain and movement limitation. Exact area of pain was anterior aspect of left shoulder joint and acromioclavicular joint area. Pain was constant in nature and aggravating factors were reaching something on a high self, wearing jumper, combing hair and carrying heavy objects. In contrast, ease factors includes hanging the left shoulder. She had history of hypertension and diabetes mellitus for 5 years and taking medication for those medical problems. She has been suffering from this pain for last 6 months.

On objective examination it was found that her left shoulder is in hiking position and asymmetry in both shoulder level. In local observation, it was found that right shoulder joint both active and passive is normal but left shoulder joint as follows:

Table 1: Comparison of Range of Motion (ROM) of Left Shoulder

Active ROM	Passive ROM
Flexion- 140°	Flexion- 145°
Extension- 35°	Extension- 40°
Abduction- 110°	Abduction- 120°
Adduction- 45°	Adduction- 45°
Medial Rotation- 50°	Medial Rotation- 60°
Lateral Rotation- 30°	Lateral Rotation- 35°

Resisted isometric muscle contraction revealed decreased muscle strength in left shoulde abductors and lateral rotators. Besides, pain intensity was 7 cm in a 10 cm numerical pain rating (NPR) scale and end feel was firm. On neurological

examination, sensory test measures was found intact on both sides, motor examination in right shoulder muscles compared to left side, were grade- 5. In contrast, left side abductors and lateral rotators were grade-4. Accessory movement especially anterior directed gliding, posterior directed gliding and longitudinal cephalad was painful. Few special tests were performed and found negative results such as cervical compression and distraction test, empty can test, yeagersons test and drop arm test. In contrast, LAM test was found positive in the left shoulder joint.

Diagnostic Reasoning:

In order for the diagnosis, few red flags were checked such as history of weight loss or abdominal discomfort/swelling, fever, loss of shoulder rotation suggests dislocation. The presence of a significant sensory or motor deficit suggests a neurological lesion and tumor in the apex of lungs [3]. Besides, few yellow flags were also examined such as depression about prognosis, fear avoidance beliefs, pain syndromes and lack of family/community support as she was not progressing [4].

As patient showed positive in LAM test, it indicates that patient is suffering from left sided frozen shoulder. By reviewing the symptoms, patient was diagnosed as left sided stage I frozen shoulder [5].

Using Clinical reasoning for diagnosis:

As I am a physiotherapist, I am familiar with this type of cases earlier. I carefully listen patient's complains and develop a possible hypothesis that patient might develop frozen shoulder of left shoulder in the light of my previous experience. Then I used my non-propositional knowledge to intersect the symptoms and used previous example in this case.

By founding negative empty can test straight forward I went to LAM test and which was found positive on left shoulder and diagnosis was concluded as stage I left sided frozen shoulder. Hereby, I used pattern recognition to narrow down the diagnosis. Pattern recognition is required to generate hypothesis and hypothesis testing provides the means by which those patterns are refined, proved reliable and new pattern are learned. There are four characteristics of pattern recognition: knowledge, categorization, efficiency and accuracy [6].

Physiotherapy Treatment:

The case was given following physiotherapy treatments for 12 sessions ranging from 3 sessions per week for 4 weeks:

- Patient education on activity modifications/basic functional activities i.e. don't use heavy weight over head, don't lift your left shoulder suddenly, continue daily activities within pain tolerance and below shoulder level height.
- Another important point is that capsular fibrosis causing capsular shortening and resulting in global limitation of
- ROM. Hence, I went through the evidence to give more concentration on shoulder mobilization.
- I applied posterior directed glenohumeral joint mobilization to improve external rotation of shoulder joint with 10 repetitions in each set and total 2 sets and 2 minutes rest between sets (figure 1). Posterior directed mobilization is more effective than anterior directed mobilization to improve external rotation.
- I found there are minor improvements in abduction. Then, I went through critically appraised paper and found that caudal mobilization was found to be effective than anterior directed mobilization in improving abduction ROM. Finally, I introduced it in my practice with 10-15 glides of grade 3 and 4 of Maitland Mobilization for 5-6 times. Total duration lasted for 20 minutes.
- Upper body cycle Ergo meter: 50 rep. per minute.
- ROM exercise/stretches: 5 - 15 seconds, passive, AAROM to AROM, low load, prolonged
- Strengthening:
- Theraband: 2 directions, 3 sets of 12 repetitions (figure 2) [7].

Results:

After application of 12 sessions physiotherapy treatment, patient showed improvements in left shoulder symptoms such as pain at NPR scale by 5 cm, improvement in passive ROMs by 15°, 5°, 20°, 10° and 25° in consequently in flexion, extension, abduction, medial rotation and lateral rotation, improvement in SPDI by 42% and muscle power improved from Grade IV to Grade V in abductors and lateral rotators (table 2).

Table 2: Outcome of Pain, ROM, Muscle Strength and Disability on left shoulder

Variables	Tools for Measurement	Pre-test Score	Post-test Score	Comments
Pain	VAS Scale	7 cm	2 cm	Pain decreases by 5 cm in a 10 cm VAS scale
Passive ROM	Universal Goniometer	Flexion- 145°	Flexion- 160°	Improves by 15°
		Extension- 40°	Extension- 45°	Improves by 05°
		Abduction- 120°	Abduction- 140°	Improves by 20°

		Adduction- 45°	Adduction- 45°	Similar
		Medial Rotation- 60°	Medial Rotation- 70°	Improves by 10°
		Lateral Rotation- 35°	Lateral Rotation- 60°	Improves by 25°
Muscle Strength	Manual Muscle Testing	Flexor: Grade-V	Flexor: Grade-V	Similar
		Extensor: Grade-V	Extensor- Grade-V	Similar
		Abductor: Grade-IV	Abductor: Grade-V	Improves by Grade-I
		Adductor: Grade-V	Adductor: Grade-V	Similar
		Medial Rotator: Grade-IV	Medial Rotator: Grade-V	Improves by Grade-I
		Lateral Rotator: Grade-IV	Lateral Rotator: Grade-IV	Improves by Grade-I
Disability	Shoulder Pain and Disability Index (SPDI)	80%	38%	Improves by 42%

Figure 1: Comparison of ROM before and after treatment

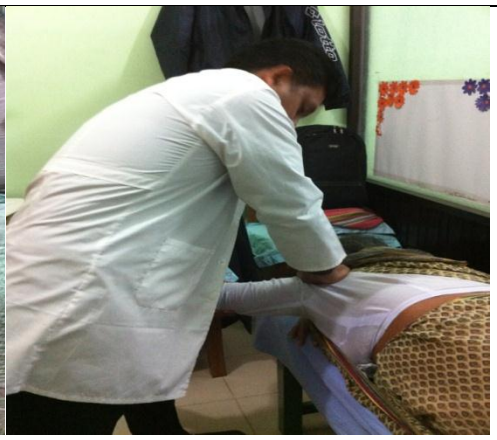
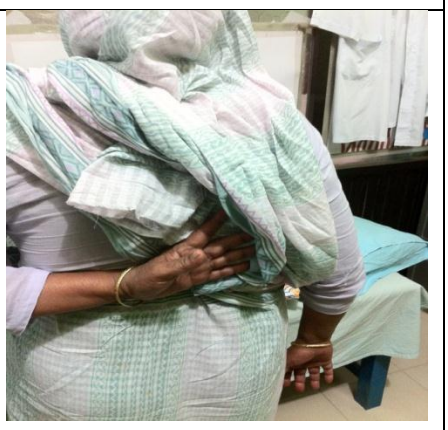
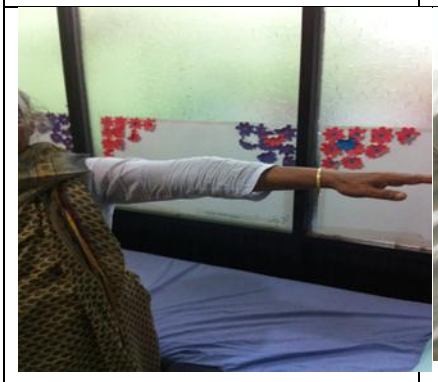
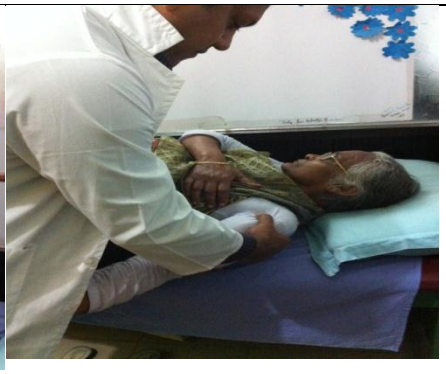
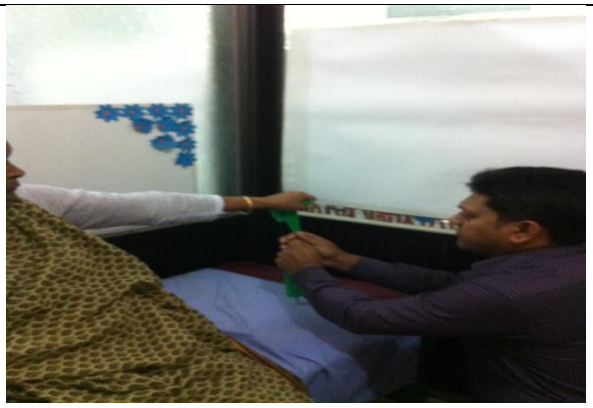
Medical Rotation before treatment	**Treatment**	**Medial Rotation after treatment**
		
Abduction before treatment	**Treatment**	**Abduction after treatment**
		

Figure 2: Theraband exercise to improve muscle strength

Strengthening exercise of left shoulder lateral rotator using theraband	Strengthening exercise of left shoulder abductor using theraband
	

Discussion and Conclusion:

In this case study, patient showed reduction of pain and disability. Besides, improvement of ROM and muscle strength was observed after correct diagnosis using appropriate reasoning process. However, specific directed mobilization techniques in the affected glenohumeral joint can minimize pain, disability plus improve ROM and muscle strength which was extracted from current best available evidence. Given that scholarly literature also found diagnosis is very much important to set up goals for patient care. Correct diagnosis vastly depends on clear reasoning process for physiotherapist. Clinical reasoning process is not only confined to diagnostic reasoning process but also helps to determine physiotherapeutic treatment techniques like specific directed mobilizations for patients with frozen shoulder [8].

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