CASE STUDY OPEN ACCESS

EFFECT OF MATRIX RHYTHM THERAPY (MRT) COMBINED WITH PHYSIOTHERAPY INTERVENTION IN FROZEN SHOULDER – A CASE REPORT

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ABSTRACT –
This case report demonstrates a combined effect of therapeutic modality MRT and physiotherapy intervention program for the treatment of frozen shoulder and reports its results. A 52 years old male working as a manager, came to yashosai hospital at physiotherapy department with complaint of pain & difficulty in movement in right shoulder joint. According to assessment grade II tenderness, hypomobility, muscle atrophy, decreased muscle strength and decreased range of motion of right shoulder joint was present. The investigation report concluded that, there was Tendinosis of Supraspinatus, Sub-acromial & deltoid bursitis, Biceps tendinosis, Osteoarthritic changes in AC joint. So according to assessment and MRI investigation suggest the case of Right Side Frozen Shoulder. After administration of MRT (Matrix Rhythm Therapy) & Physiotherapy exercise program there was reduction in pain, increase in muscle strength and range of motion.
Keywords: frozen shoulder, MRT, Exercises etc.

INTRODUCTION -
Frozen shoulder or adhesive capsulitis, is characterized by pain and gradual restriction of shoulder motion. The cause of frozen shoulder is not well known and it often occurs for unknown reasons.
Frozen shoulder is reported to affect 2% to 5% of the general population [1-3]. Factors associated with frozen shoulder include female gender, being over 40 years of age, trauma, immobilization, diabetes, thyroid disease, stroke and complex regional pain syndrome [4,5]. The definitive treatment for frozen shoulder remains unclear even though many interventions have been studied including active/passive range of motion (ROM) exercises, stretching, soft tissue mobilization, myofascial release, proprioceptive-neuromuscular facilitation techniques, ultrasound, electrical stimulation, ice packs and joint mobilization techniques [6]. Unfortunately, varied inclusion criteria, different treatment protocols, different treatment sessions, various outcome measurements and natural course of recovery make study comparison difficult.
Matrix Rhythm Therapy (MRT) provides vibromassage and aims to induce correct metabolism through a specific physiological pulse. The MRT device activates and rebalances specific vibration in skeletal muscles and the nervous system. The device produces an oscillating rhythm that maximizes lymphatic venous perfusion of the extracellular space in which the anti-edematous effects originate[7–9]. Studies are needed to investigate the principles and broader applications of MRT. There are few studies describing clinical experiences and the effectiveness of MRT, and there is a low level of evidence for its effectiveness.
There are a few studies and clinical experience that indicate the effectiveness of MRT [10-12] but there is not any study which used MRT in treatment of frozen shoulder.

SUBJECT & METHODS –
A 50-year-old male (height 172 cm, weight – 67 kg, BMI – 23.18 kg/m^2, body type – mesomorphic) with complaint of right shoulder pain, difficulty to lift objects along with difficulty in movement in the last 3 month. By occupation he was mistry manager since from 30 years. He is used to lift heavy objects in he had history of trauma 3 months back in which he was holding a wooden block over tractor and suddenly block get slipped down & he felt a jerk to his right arm. He had visited to local doctors where they prescribed rest and medication, but there was temporary relief. So, he visited to yashosai hospital at physiotherapy department, where examination and treatment was done.

EXAMINATION –
The pain and functional evaluation was measured with the help of VAS (Visual analogue Scale)[13] and Disabilities of Arm, Shoulder & Hand (DASH)[14]. VAS consist of 10 cm length scale (0 – no pain, 10 – severe

pain). DASH consist of 30 items, scored on no difficulty, mild difficulty, moderate difficulty, sever difficulty and unable. Written inform consent to publication of this case report was obtained from the patient after describing the nature of assessment an procedure.

MRT Intervention [7-11] –

The training program was applied over the 45 min starting from the shoulder girdle and including anterior, posterior and lateral aspect. Patient were in the three position,

A. Supine position with arm abducted to available range and MRT was applied around the anterior aspect of shoulder region (pectoral muscles, anterior fiber of deltoid muscle & biceps muscle).
B. Side lying – (2A) Side lying with arm rest over the body and MRT applied to lateral aspect of the shoulder region (middle fiber of deltoid muscle). (2B) side lying with arm abducted to available range and MRT applied to inferior aspect of shoulder region i.e. Armpit or axillary region (above & below armpit).
C. Prone lying with arm abducted to available range and MRT applied to posterior aspect of shoulder region including neck and upper back region (posterior fiber of deltoid muscle, supraspinatus & infraspinatus muscle, tricep muscle, latissimus dorsi muscle, serratus anterior muscle and trapezius muscle from occiput to spine of scapula.) 15 minutes to each position.

The patient received treatment at yashosai hospital physiotherapy department, 3 times a week, for 3 weeks. (Appendix – I)

Physiotherapy intervention [15-18] **-**

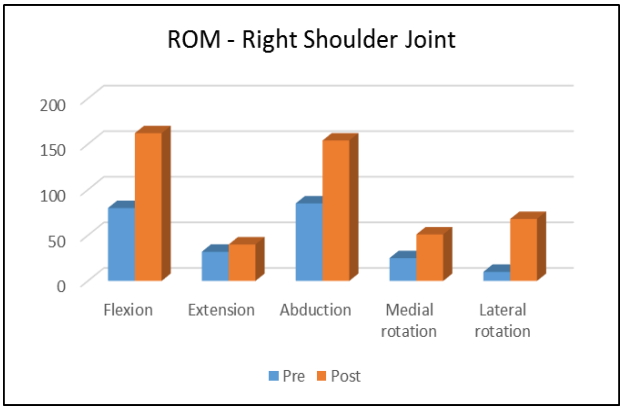
The patient was taught to perform active exercises to shoulder joint, wand exercise, pendulum (Codman's exercise), isometric exercise (self-resisted & against wall). (Appendix – II A & B)

Result –

When the patient discontinued the treatment after 3 weeks he achieved significant functional gains with an improvement in the **ROM** (Range of Motion), **MMT** (Manual Muscle Strength), **VAS** (Visual Analogue Scale) & **DASH** (Disabilities of Arm, Shoulder & Hand).

Table no. 1 : ROM Rt Shoulder Pre-Post

ROM (Rt shoulder joint)		
	In degree	
	Pre	Post
Flexion	80	162
Extension	32	40
Abduction	85	154
Medial rotation	25	51
Lateral rotation	10	68



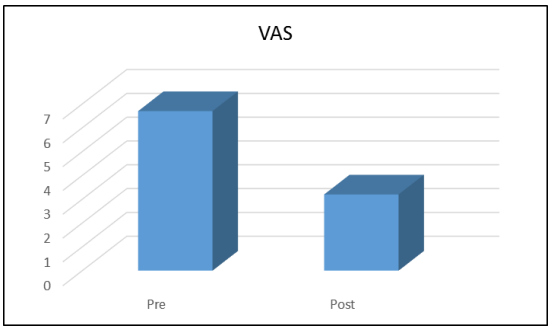
Graph no. 1 : ROM Rt Shoulder

Table no. 2: MMT (Rt Shoulder Joint) Pre and Post

MMT (Rt Shoulder Joint)		
	pre	post
Flexion	3	4
Extension	3	4
Abduction	3	4
Ext. Rot.	2	3
Int. Rot.	2	3

Table no. 3: VAS Pre and Post

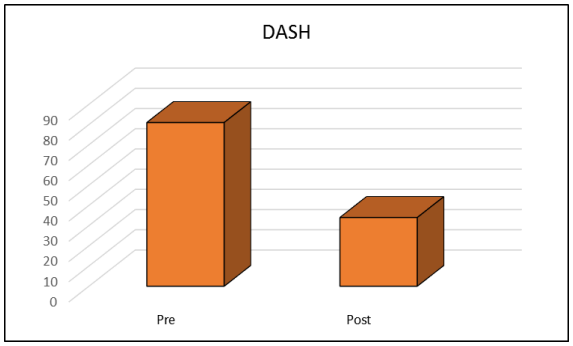
VAS	
Pre	Post
6.7	3.2



Graph no. 3: VAS Pre and Post

Table no. 4: DASH Score Pre and Post

DASH Score	
Pre	Post
81	34



Graph no. 4: DASH Score Pre and Post

DISCUSSION –

The results of our study show that both MRT & Therapeutic exercises were found to be significantly effective in the improvement of ROM, functional status, physical health and satisfaction of the patients. DASH score showed a significant improvement.

MRT has been very popular and is a widely-used treatment device in some of the European countries as well as in Turkey for musculoskeletal problems such as frozen shoulder, carpal tunnel syndrome, plantar fasciitis, fibromyalgia and tendinopathies. However, it is a new treatment method and lacks of scientific support. The MRT device is thought to be compatible with the natural vibration frequency of the muscle, which is considered to contribute to the therapeutic effectiveness of MRT [19].

MRT developers believe that decreased circulation of the skeletal muscles causes cramp, pain and limited ROM. The natural vibration of MRT helps circulation of the skeletal muscles and provides oxygen and adenosine triphosphate (ATP), and helps to gain ROM and to reduce pain. One of the previous studies showed that MRT increases the blood circulation by 35% [20]. There are a limited number of studies with a low level of evidence about the effects of MRT on musculoskeletal problems.

Jager et al [21] have assessed the effect of MRT on pain level, sleep patterns and flexibility of the spine in patients with low back pain. The results of that study, involving 80 patients, demonstrate that the application of MRT, compared with conservative therapy (including application of warmth, electrotherapy, and exercise), is more effective in reducing pain and increasing flexibility.

Randoll and Hennig et al [10] applied MRT in 65 patients with low back pain over six sessions within a week, and they reported a significant improvement in pain [10]. In our study, MRT application increased physical health, function and satisfaction of the patients.

As the patient were taught to perform active exercises to shoulder joint, wand exercise, pendulum (Codman's exercise), isometric exercise (self-resisted & against wall), which are effective in, to improve ROM and MMT of right shoulder. Similarly, **Diercks and Stevens et al** [22] prospectively followed 77 patients with idiopathic frozen shoulder for 24 months to compare the effects of "intensive physical therapy consisting of active exercises up to and beyond the pain threshold, passive stretching, glenohumeral joint mobilization, and home exercises" to "supervised neglect."

CONCLUSION –

The combination of Matrix Rhythm Therapy and Physiotherapy intervention have a beneficial long term effects on physical health, functional outcome and satisfaction of patient with frozen shoulder.

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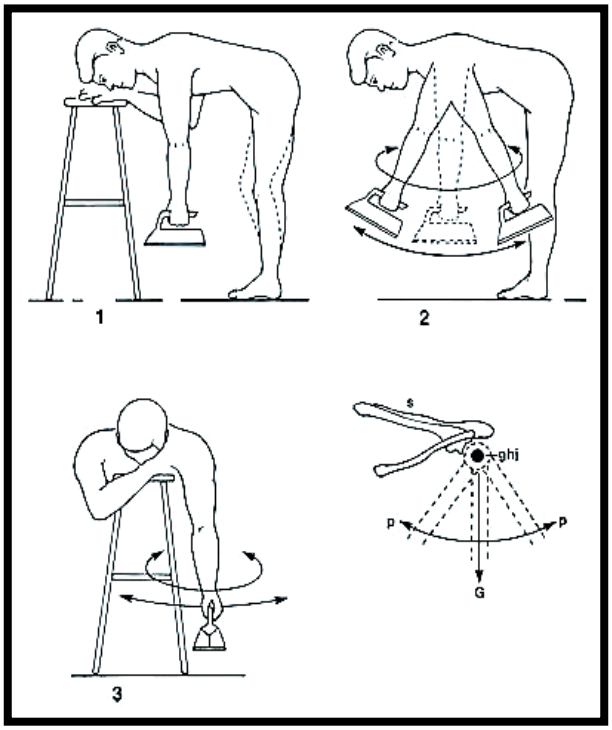
Appendix - I

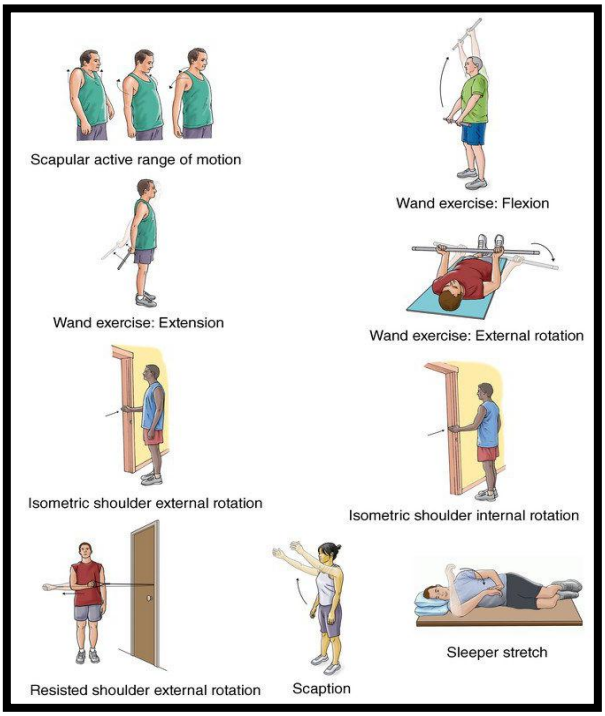
A. MRT in Supine Lying

B. MRT in Side Lying

C. MRT in Prone Lying



Appendix – II (A) : Codman Exercises



Appendix – II (B): Shoulder Exercises

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