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# Title : Maitland Mobilisation along with Conventional Physiotherapy in Lumbar facet joint syndrome - A case Series

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## ABSTRACT -

**Background :** Interest in the lumbar facet joint has been revived in recent years and various modalities of treatment for lumbar facet joint syndrome have been described by numerous authors. This study was undertaken to find out effectiveness of Maitland lumbar spine mobilization and conventional physiotherapy in patients with lumbar facet joint syndrome. **Purpose :** To describe the management and outcomes of 5 patients with lumbar facet syndrome treated with Maitland Lumbar spine mobilization, Therapeutic Ultrasound and lumbar stabilization exercises.**Study Design :** A case series of consecutive patients with Lumbar facet joint syndrome **Case Description:** Five consecutive patients (mean age 52 years) who presented with lumbar facet joint syndrome were treated with two weeks protocol which included Maitland Mobilisation, Therapeutic Ultrasound (Cont. 1-MHz , 2.0-W/cm2,10min) and lumbar stabilization exercises. Follow up was taken 1 week after the end of active intervention. All patients completed Visual analogue Scale (VAS), Modified Oswestery Disability Questionnaire (MODQ), Sorensen Test hold Timing and spinal Range of motion on initial assessment, immediately at the end of active intervention ( 2 weeks) and at the of follow up. **Outcome :** All five patients showed the mean percentage change in score of VAS 41.38 %, MODQ 46.98 % ,Sorensen test score 12.88 % , Flexion range 5.64 % and extension range 13.86 % at the end of follow up. **Discussion :** The purpose of this case series was to describe the outcomes in four patients with Lumbar facet syndrome using maitland spinal mobilization, therapeutic ultrasound and spinal

**Key words :** Lumbar facet joint syndrome, Maitland mobilization, Therapeutic Ultrasound

**Introduction :** The lumbosacral Z-joint is reported to be the source of pain in 15-40% of patients with chronic LBP. The first discussion of the Z-joint as a source of LBP was by Goldwaith in 1911.[1] In 1933, Ghormley coined the term “facet syndrome” suggesting that hypertrophic changes secondary to osteoarthritis of the zygapophyseal processes led to lumbar nerve root entrapment, which caused LBP.[2]

Lumbar facet joints are a well-recognized source of low back and referred pain in the lower extremity in patients with chronic low back pain[3]. Facet joints are well innervated by the medial branches of the dorsal rami[4]. Neuroanatomic, neurophysiologic, and biomechanical studies have demonstrated free and encapsulated nerve endings in lumbar facet joints, as well as nerves containing substance P calcitonin gene-related peptide[5]. In addition to causing localized spinal pain, facet joints may refer pain to adjacent structures. Pain referral patterns of facet joints have been well described[6].

Physiotherapy treatments including land-based lower back mobility exercise and soft tissue massage may be of benefit during this time to improve the longerterm outcomes of patients with chronic low back pain and facet joint pain.[7]

People who report low back pain often have reduced spinal motion.[8,9]When motion is limited, spinal extension is frequently more restricted than flexion.[9] Reduced spinal extension can be the result of pain or stiffness and can be classified as being either general (ie, total spine) or segmental (ie, one vertebral level). Spinal mobilization techniques and range-of-motion exercises often are prescribed by physical therapists in an attempt to lumbar range of motion and ultimately reduce low back pain.[10]

Commonly used method for improving spinal extension is passive segmental mobilization. Maitland et al advocated the use of a segment specific approach (ie, posterior-to anterior [PA] mobilization), in which

the intervention is focused on the specific vertebral levels that demonstrate restricted motion.

A number of investigators have cited evidence that supports the use of stabilization exercises for enhancing spinal stability.[11] The local muscles are said to be crucial in this mechanism. This may be because of their contribution to maintaining the position of the spine and their ability to improve trunk endurance. Core stability training is frequently used to improve spinal stability. It has been used for many years in physical therapy and has become popular in fitness settings[12]. It has been speculated that this method of training improves spinal stability and may assist in decreasing the risk of back pain.

Till date no studies in physiotherapy have assessed efficacy of Maitland mobilization treatment of lumbar facet joint syndrome. The aim of case series, therefore, to describe the management and outcomes of 5 patients with lumbar facet syndrome treated with Maitland spinal mobilisation, Ultrasound and lumbar stabilization exercises.

**Method :** Five consecutive patients, referred physical therapy outpatient department with a diagnosis of lumbar facet syndrome were screened for the eligibility criteria in this case series. All participants satisfied the inclusion criteria i.e Participants diagnosed with facetal arthropathy on MRI, localised unilateral lumbar pain, Replication or aggravation of pain by unilateral pressure over the facet joint, Pain eased in flexion, Pain in extension, lateral flexion or rotation to the ipsilateral side were included in the study. Exclusion criteria for the study were history of Spinal Surgery, Trauma to the spine, and Manipulation under anesthesia, Metabolic Disorders – Osteoporosis and Spinal Tumors. Each subject signed written informed consent. This study was approved by Institutional Ethical Committee of PIMS, Loni.

**Outcome Measures :** Modified Oswestry Low Back Disability Questionnaire. The questionnaire consists of 10 items addressing different aspects of function. Each item is scored from 0 to 5. Total Score was converted in percentage, scores range from 0-100% with lower scores meaning less disability.[13]

**Pain :** The pain VAS consisted of a 10 cm horizontal line anchored at one end by the words 'no pain' and at the other end by the words 'worst pain'. [14]

Back Endurance Testing : Sorensen Test

Biering-Sorensen describes this method of testing isometric back endurance; it measures how long (to a maximum of 240 seconds) the subject can keep the unsupported trunk (from the upper border of the iliac crest) horizontal while prone on an examination table . Published studies demonstrate that the test assesses the endurance of all the Muscles involved in extension of the trunk, which include not only the paraspinal muscles, but notably the multifidus muscle. [15]

Spinal Range of Motion: Modified Schobers Test

Macrae and Wright modified the original Schober method by marking a point 5 cm below and 10 cm superior to the lumbosacral junction. When the patient moves into full lumbar flexion, the increase in distance between the marks gives an estimate of spinal flexion ROM.[16]

**Intervention:** All patients in this case series attended physiotherapy 5 times weekly for period of 2 weeks. Each treatment session lasted for a total of 30 minutes. During the sessions, patients received Maitland spinal mobilization, Therapeutic ultrasound around affected area and spinal stabilization exercises. After 2 weeks of active intervention subjects were allowed to continue stabilization exercises at home until the 3-week follow-up visit.

**Maitland Spinal Mobilisation Technique :** Grade 1 and 2 joint mobilizations as defined by Maitland were performed. Grade 1 joint mobilizations are small-amplitude movements used at the beginning of the joint's range of motion in an attempt to decrease or control patient pain levels. Grade 1 joint mobilizations was performed before a progression to grade 2 joint mobilizations.

Grade 2 joint mobilizations are large-amplitude movements that carry halfway into the joint range of motion, occupying any part of the range and yet not reaching the end range. This technique can be used to treat joint stiffness by increasing range of motion and joint pain by stimulating mechanoreceptors.[17]

During posteroanterior mobilizations in the lumbar spine, the patient was instructed to relax and lie prone

with his hands either by his side on the treatment table or above his head and with his head turned comfortably to one side. Because the implementation of large-amplitude, oscillating movements requires small forces, the physiotherapist used his or her hands rather than thumbs when applying pressure to the patient. Standing on the right side of the patient, the clinician placed the left hand on the patient's back so that the ulnar border of the hand between the pisiform and hook of the hamate was directly over the spinous process of the vertebra to be mobilized. The Physiotherapist's shoulders were directly over the point of contact, and full wrist extension was maintained with the forearm in neutral between supination and pronation. Correct positioning of the wrist and forearm of the clinician is the key to sustaining the accuracy of the contact point and the localization of the manoeuvre. The physiotherapist's right hand then reinforced the left by placing the carpus of the right hand over the radial aspect of the left carpus at the base of the left index finger through the approximation of the right thenar and hypothenar eminences. This placed the right middle, ring, and little fingers between the left index finger and thumb, while the right index finger and thumb were over the back of the left hand. Stability was maintained through grasping the palm of the physiotherapist left hand between the thenar eminence and the middle, ring, and little fingers of the left hand and through sustained extension of his right wrist.

The Physiotherapist's shoulders were directly over the contact point on the patient's spinous process, while the elbows were slightly flexed. The oscillating movement that accompanies joint mobilization of the vertebra is obtained by a rocking motion of the upper trunk in an up-and-down direction in the vertical plane, with the transmission of pressure coming through the clinician's arms and shoulders as they act as springs.[17] This technique was administered once, with a protocol consisting of grade 1 and 2 joint oscillations for 30 seconds each. Grade 1 joint mobilizations were administered consecutively to the 3 spinous processes that surround the pathologic area with 30 seconds of rest in between, followed by grade 2 joint mobilizations performed in the same manner, for a total of 6 repetitions of joint mobilizations.

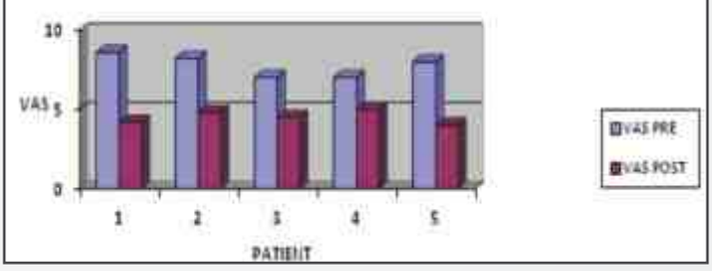
**Follow-up Measurements :** All patients completed the MODQ, VAS, Sorens test Score and Flexion – Extension range of motion at 3rd weeks (Follow up visit) after the initial examination.

**Analysis :** Pre-and post treatment scores were converted to a change score by formula: Change score= Pre treatment score-Post treatment score × 100 / Pre treatment score

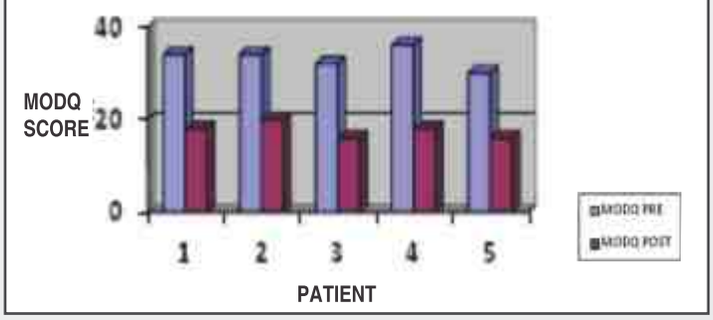
| Case | VAS | | % change | MODQ | | % change | Sorensens Test Score | | % change |
|---|---|---|---|---|---|---|---|---|---|
| | Pre | Post | | Pre | Post | | Pre | Post | |
| 1 | 8.6 | 4.2 | 51.16 | 34 | 18 | 47.05 | 78 | 86 | 10.25 |
| 2 | 8.2 | 4.8 | 41.46 | 34 | 20 | 41.17 | 76 | 86 | 13.15 |
| 3 | 7 | 4.5 | 35.71 | 32 | 16 | 50 | 75 | 87 | 16 |
| 4 | 7 | 5 | 28.57 | 36 | 18 | 50 | 77 | 86 | 11.69 |
| 5 | 8 | 4 | 50 | 30 | 16 | 46.67 | 75 | 85 | 13.33 |
| | | | **41.38** | | | **46.98** | | | **12.88** |

**Outcome :** All five patients showed the mean percentage change in score of VAS 41.38 %, MODQ 46.98 % ,Sorensen test score 12.88 % , Flexion range 5.64 % and extension range 13.86 % at the end of follow up.

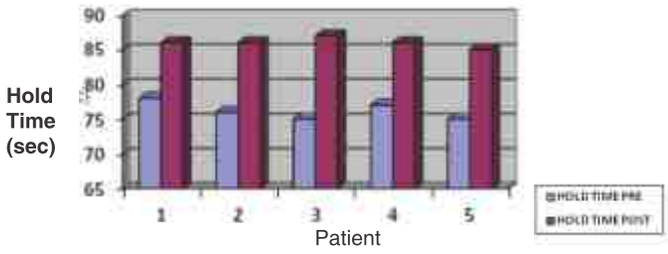
**GRAPH 1 : COMPARISON OF VISUAL ANALOGUE SCALE**



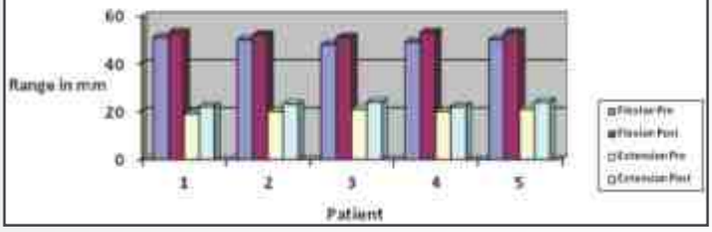

**GRAPH 2: COMPARISON OF MODQ SCORE**



GRAPH 3: COMPARISON OF SORENSEN'S TEST HOLD TIME




GRAPH 4: COMPARISON OF SPINAL RANGE OF MOTION




**Discussion :** The purpose of this case series was to describe the outcomes in four patients with Lumbar facet syndrome using Maitland Spinal mobilization, Therapeutic Ultrasound and spinal Stabilisation exercises. Although a cause-and-effect relationship cannot be inferred from a case series, our results suggest that this particular treatment approach may be beneficial in improving the outcomes in patients with lumbar facet syndrome.

All four patients showed improvement in pain (41.38%) at the end of follow-up. ( Graph1) The 41.38% reduction in pain following lumbar PA mobilization in the present study is consistent with that reported in previous investigations. For example, Chiradejnant et al[18,19] reported a 36% reduction in pain following two 1-minute bouts of spinal mobilization in subjects with nonspecific low back pain. Mobilization may be perceived to stretch fibrous tissue in or around the joint, and on the grounds that stretching fibrous tissue may cause it to creep, it is sound in principle if the objective is to increase the range of motion[20]. Some of the effects of PA mobilisation on a patient suffering from facet syndrome could be Unlocking of osseous restrictions, Reduction of local vascular stasis, Freeing of capsular adhesions and release of entrapped meniscoids. Flynn[21] indicates that mobilization be used for restoring passive accessory motion, reducing pain and increasing segmental and total spinal range of motion. ( GRAPH 4)

In present case series improvement (Mean 19.63%) was seen in hold time in sorensens test at the end of follow up.( Graph 3). Decreased trunk strength and endurance associated with a cyclical pattern of deconditioning through pain, avoidance and inactivity have been noted as defining characteristics in LBP.[22] In addition to improvement in Range of motion and reduction in pain, MWM in a weight-bearing position requires muscle activity, which might have resulted in improved motor performance and increase in strength of core muscles when applied along with core stabilisation exercises. Lumbopelvic stabilization approach seems to be useful for the management of low back pain. Based on a solid biomechanical model (Panjabi's hypotheses), it has demonstrated positive effects over pain and return to activity, but it is not clear the optimal type of exercise, duration or number of repetitions, among other variables.[23] Exercises designed to improve spinal stabilization have gained popularity in the conservative treatment of patients with LBP; however, the evidence for the effectiveness of this approach is sparse and equivocal. Improvements in pain intensity and functional disability( Graph 2) were also demonstrated in groups of patients with low back pain suffering from a spondylolisis or a spondylolisthesis and a significant decrease of symptoms in people with hypermobility.[24]

**Conclusion :** In this case series, all five patients with Lumbar facet syndrome treated with Maitland Mobilization,Therapeutic Ultrasound and lumbar stabilisation exercises exhibited reduced pain reduced disability ,improved endurance of back muscles and range of motion at the time follow-up. This report allows for initial hypothesis development that this approach may have clinical merit.

**Limitation :** Limitations of this report are inherent to its case series design. Without a comparison group, we cannot determine if similar improvements would have occurred had these patients received a different treatment approach or no treatment at all. Future research in the form of randomized clinical trials should be conducted to investigate the effectiveness of this treatment approach in lumbar facet syndrome patients.

**Conflict of Interest :** The author's report no conflict of interest

**Funding :** None

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**WHITE COAT :** Physicians started wearing white coats in 1889. Surgeons were the first to wear them because they were the first to adopt the aseptic techniques coming of age at the time. The coat protected the physician from the patient and vice versa.

Meanwhile, their nonsurgical colleagues wore business suits, often with frock coats called “Prince Albert.” By the early 1900s, physicians of many specialties wore white coats.

The white coat has served as the pre-eminent symbol of physicians for over 100 years. A child's earliest memory of a doctor is the person in the white coat.

Patients expect to be treated in doctors' offices, hospitals and clinics by an individual wearing white.

In the 20th century, the white coat continued as the symbol of medical authority and respect as advance upon advance firmly established the patient-doctor relationship as a beneficial encounter.

(source "Jones VA, "The White Coat:
Why not Follow Suit?" JAMA. 1999;281:478."|)