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Case Report

Evidence Based Physiotherapy Management of a Patient with Chronic Low Back Pain having Multiple Disc Herniation with altered Lumber Spine: A Case Report

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ABSTRACT

Background: Chronic low back pain is one of the most debilitating health issues in the world. Patients with chronic low back pain (CLBP) frequently exhibit a lumbar lateral shift (LLS). The most frequent presentation is a shift that is contralateral to the side of pain.

Purpose: The purpose of this case study is to provide an overview of the management and rehabilitation of the patient with LBP with LLS by using specific problem-oriented treatments.

Case Report: In this case study, a 48-year-old female patient has persistent low back pain and discomfort that has lasted for 15 years associated with lumber shift for 6 months. On physical examination, the Numeric Pain Rating Scale, Oswestry Disability Index, Back Pain Functional Scale, and Straight Leg Raise were evaluated on the initial visit to physical therapy and after discharge. She visited 3 times a week over 1 month period, by this point, she had received prophylaxis, manual and self-shift correction techniques, stretching and strengthening of weak muscles to quickly correct deformities and lessen pain, as well as rehabilitation to a high level of function and long-term follow-up at three months.

Outcomes: The patient reported NPRS = 8/10, ODI = 68%, and BPFS = 24% on the initial visit. At discharge, the patient reported a 0 on (NPRS & ODI), and BPFS =91% with the ability to return to full work and no associated symptoms or complaints.

Conclusions: The integrated physiotherapy approach implemented in this case study was effective in relieving the patient's persistent low back pain and altered lumber spine and it returned the patient to a higher level of functional activity within only 4 weeks.

KEY WORDS: Low Back Pain, Physiotherapy, Manual therapy, Strengthening.

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INTRODUCTION

Chronic low back pain (CLBP) is a consequential medical concern distinguished by pain, discomfort, muscle weakness, sleep interruption, depressed mood, and loss of mobility that lasts longer than 12 weeks and has a significant critical impact on daily activities [1].

It is more familiar among middle-aged and older adults who have regular hospital checkups, are most likely to have major prevalence and incidence rates, and have severe physical, social, occupational, and financial hardships, along with other musculoskeletal disorders [2]. LBP is segregated as pain that occurs just above the gluteal folds and below the 12th rib. It is acknowledged as a disorder rather than a disease & can be manifested with different symptoms such as muscle pain, radiating pain/shifting pain, diminished ROM, and reduced functional activity due to twisting, bending, faulty posture, altered biomechanics, recurrent falls, injuries, & lifting weights frequently [3]. Patients with low back pain (LBP) often have a lumbar lateral shift (LLS), with the most frequent presentation being a shift that is contralateral to the side of the complaint [10]. Besides the local or regional pain, lumber spine and its related pain can be radiated to the lumbosacral, buttock, anterior thigh, leg up to the heel along with the dermatome's distribution area via nerve or dorsal root ganglion [4]. When a nerve root is involved, radicular pain is commonly known as sciatica. Sciatica should not be used unless there's constant involvement at back, leg, or heel [5]. Globally, it seemed the 80–84 age group had major complaints about LBP, and was elevated in 2019 in Central Europe, Oceania, Eastern Europe, East Asia, South Asia, and Southern Latin America regionally. Another study conducted in China estimated the prevalence of LBP among physicians at 44% [9]. LBP has risen dramatically by 54% since 1990, and the biggest amplitudes have been in low and middle-income countries (LMICs), just like Bangladesh [7]. In a cross-sectional study, it was picturized that in Bangladesh, the age-standardized prevalence of LBP was 19.4% and the weighted prevalence of LBP was 18.5%. Women had a greater prevalence of LBP than men (35.1% to 19.3%) [8]. The 35–54 age group had the most LBP (27.8%), and the incidence steadily grew. The highest prevalence was found among those with no formal education (40.4%) [8]. In the last 30 years from 2019, new cases of LBP had been increased by 50%, from 14.9 million to 22.3 million.

CASE REPORT

Subjective findings: Mrs. Kulsum Begum, 48, a maid who had been working door to door for 20 years, made her first visit to Savar, CRP, for physiotherapy treatment for her severe low back pain. The patient had a 15-year history of LBP with pain radiating to the right cuff muscle in the previous six months, and the condition was getting worse by the day, with lateral shift on the right side. The patient exhibited severe muscular spasms over the ASIS region, and the lumber lordosis was reduced from its typical curvature. She had no previous record of falls or accidents. Her profession involved prolonged sitting postures and lifting heavy objects. The constant symptom persisted always in the back with sleep disturbance on regular basis. Additionally, the patient complained of discomfort during coughing and sneezing. She found it extremely difficult to bend, sit, stand up from a sitting position, go up and down stairs, and walk. She felt relief in unloading, e.g., in the lying position. Previously, she took medication to get relief from pain. The gait pattern was antalgic during the first evaluation. She was confronting 8/10 general pain intensity according to the NPRS at the time of assessment. She has been diagnosed with diabetes mellitus since 2010. The researcher found this particular case different and special enough to be acknowledged, as a novice graduate physiotherapist.

Clinical Findings

Observation: Both the patient's standing and prone-lying positions were observed. In a standing position, the head was turned to the right side, the neck had lost some of its curvatures and protruded, the shoulders were asymmetrical, the thoracolumbar shift was

visible from the back side, the pelvis was tilted posteriorly, and both legs were in an asymmetrical position during weight bearing **(Figure. 1)**

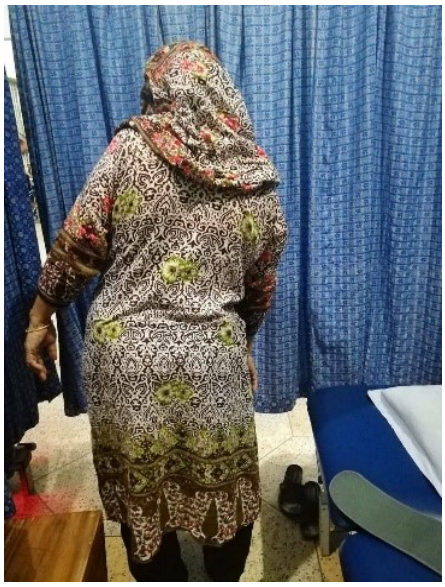

Fig. 1: Lumber Lateral Shift of the current case.

Spinal Segment: On palpation spinous process of the thoracic and lumber vertebrae was palpable. Tenderness and moderate to severe muscle spasms were present over the erector spinae, gluteus, transverse abdominis and obliques muscles. Transverse processes of the vertebrae were asymmetrical due to postural instability.

Motor And Sensory examination: Light touch and pinprick sensation was intact and equal from L1 to S1 with normal patellar and achilles deep tendon reflex response. For the part of neurological examination, myotomes from L1 to S1 were G-III (Oxford Muscle Grade) and equal bilaterally.

Special Test: SLR found left (50°) due to hamstring tightness and on right (55°) with the production of buttock pain (specificity 0.52 and sensitivity 0.89) [25].

Diagnostic Measurement: On X-ray, lumber spondylosis was seen with osteophyte lipping on the vertebral body **(Figure: 2A)**

and Lumber curvature had been straightened. Based on the evidence of radicular pain, the patient was prescribed to do MRI, as a confirmatory diagnostic tool (sensitivtity:98.9%, specificity:99.1%) [29]**.** On T2- weighted MRI degenerative osteoarthritic change and mild shift picturized with central and paracentral disc herniation at L1-L4 segments also corresponding nerve root compression on L4 more to the left side. **(Figure: 2B, 2C).**

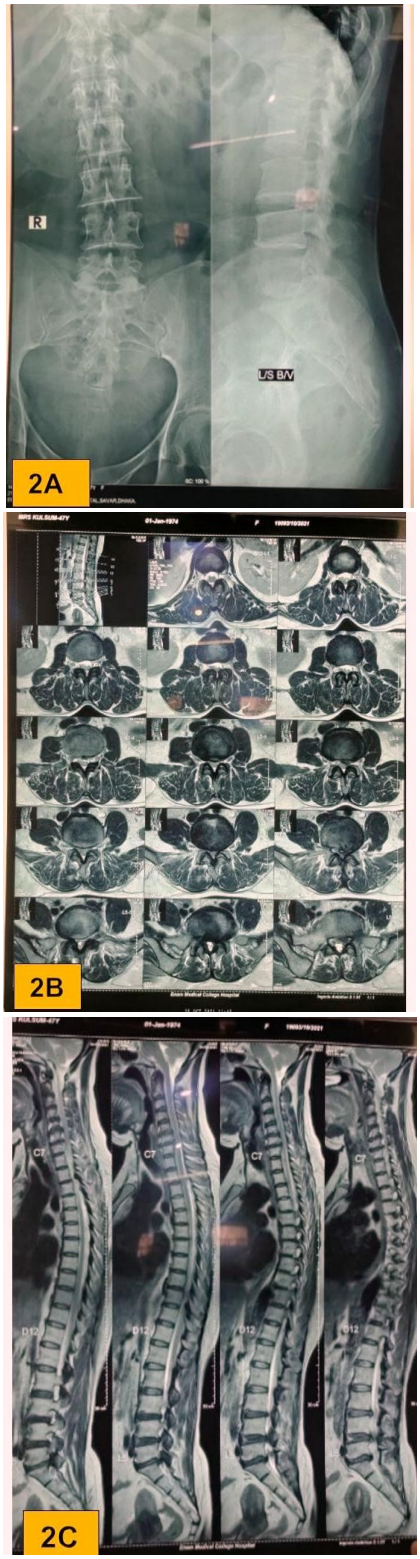

Fig. 2: Radiological findings. 2A) Both P/A & B/V of X-ray; 2B) MRI of L/S showing T2-weighted axial view; 2C) T2 weighted sagittal view.

Therapeutic Intervention: Participant attended three times per week for a total of 12 treatment sessions of 30 minutes each at the CRP, Savar, under the supervision of a skilled

Clinical Physiotherapist. At 1st week sessions were based upon relieving pain by maintaining posture for everyday life, correct postures at work and rest, and back-protection techniques according to McKenzie guidelines and left pelvic side gliding exercise [16] for self-shift correction, soft tissue mobilization-myofascial release at trigger point [11], stretching of Transverse abdominis, Erector spinae & Lumber Multifidus [12] and application Transcutaneous Electrical Nerve Stimulation (TENS) [13, 21].

During 2nd week the treatment was provided such as soft tissue mobilization [11], neural tissue mobilization [14] manual shift correction exercise by the therapist and patient-self; posterior pelvic tilt exercise with lumber extension [10] & hot compression. (**Figure: 3A. 3B).**

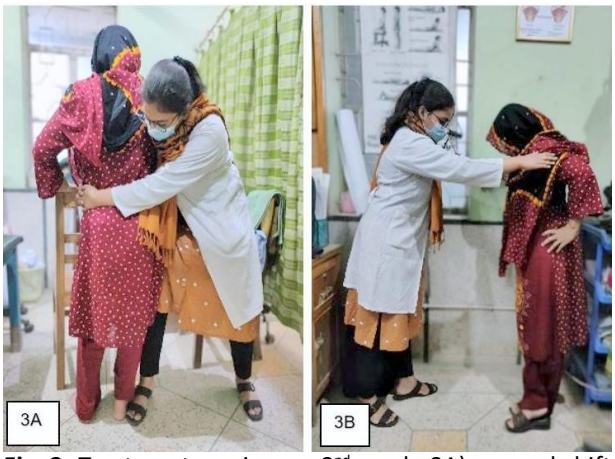

Fig. 3: Treatment session on 2nd week, 3A) manual shift correction by the therapist; 3B) lateral shift correction by patient-self.

During 3rd week, the therapist moved on to strengthening exercises diversely rather than other manual therapy. Core muscles, abdominal muscles specially rectus abdominis, gluteus and hip flexors strengthen through weight progression as well as resistance [15] and motor control exercises [16].

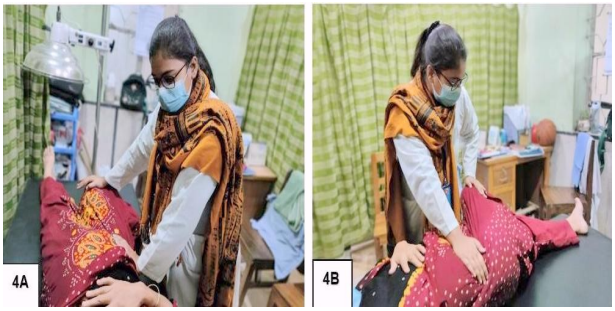

Fig. 4: Treatment session on 4th week, 4A) Quadriceps outer stretching; 4B) Quadratus lumborum stretching.

In last week visits, stretching of quadratus lumborum, iliotibial band, and strengthening of quadriceps, specific trunk muscle activation [17,22] to correct forward head posture and thrust mobilization [18] at sacroiliac joint along with lumber spine were followed. **(Figure.4A. 4B).**

After 1 month of treatment. The patient was also educated on postural correction, how will she conduct home exercises, and most importantly information about fear avoidance [19].

Table 1: The observed functional measurement of the lumber spine of the patient.

Functional Measurements	Initial Evaluation	Week 2/Visit 4	Week 3/Visit 7	Week 4/ Visit 12 (Discharge)
Flexion	25°, pain-free	30°, pain-free	35°, pain-free	40°, pain-free
Extension	5°, pain throughout	8°, pain at end range	10, pain-free	10°, pain-free
Side Flexion (Rt)	Total loss	5°, pain-free	8°, Pain during the movement	10°, pain-free
Side Flexion (Lt)	5°, pain-free	10°, Pain during the movement	12°, pain-free	15°, pain-free
Standing tolerance (Duration)	3 mins	10-15 mins	20 mins	30 mins
Lifting tolerance (Duration)	0 mins	2 mins	5 mins 30 secs	10 mins

Table 2: Outcomes in a patient with chronic LBP and alternating LLS.

	Baseline (visit 1)	Discharge (visit 12)	Follow-up (3-months Later)
Numeric Pain Rating Scale (NPRS)	8/10	4/10	0/10
Back Pain Functional Scale (BPFS)	12/60, 24%	40/60, 80%	55/60, 91%
Oswestry Disability Index (ODI)	34/50, 68%	8/50, 16%	0/50, 0%
Lumber AROM	Flexion, extension, side flexion was limited and painful	FAROM, pain-free	FPROM & FAROM
Passive Straight Leg Raise (SLR)	Left: 50º with buttock and cuff pain Right: 55º	Equal Bilaterally, Pain-free	Normal

Follow-up and Outcomes: Before starting the treatment, the patient has been supervised and assessed thoroughly, and some sort of target was set for the discharge goal. At discharge, she had not experienced leg symptoms or buttock pain. Functional capacity and observed ROM were significantly higher than her first session **(Table 1).**

Her posture had much improved since the first appointment, and the AROM was full and painless. She received an ODI score of 7/50 during her last visit, which correlates to 14% impairment. The patient received a score of 0/50 on the ODI at a 3-month follow-up over the phone, indicating 0% impairment. However, she stated one moderate LBP episode lasting two weeks in the prior six months but without having physical signs of lateral shift and got better with her at home exercise program. (**Table 2).**

DISCUSSION

The current case study aimed to provide an overview of the presentation and intervention of a patient with an alternating LLS with chronic LBP. The patient in the current case study had almost no major symptoms & discomfort and had achieved all of her functional objectives after six sessions. The patient was observed to have movement limitation issues and a suspected lumbar derangement with altered lumber curvature. Peterson et al. [20] noted a similar finding with a patient with altered LLS and showed a positive result and prognosis after the treatment process. LLS can possibly be corrected through resistance, but there was no resistance throughout this scenario. LLS readily switched sides in response to physical correction, as she was unaware of it. Capener [23] also described a patient who experienced an LLS 'snapped' to the opposite side during lumbar flexion. The LLS alternated between visits to another patient but was not conclusively proven to do so [23]. The LLS swiftly switched sides due to a manual shift adjustment in the weight-bearing position. A multimodal intervention strategy, including spinal manipulation, soft tissue mobilization, and trunk muscle activation, was used tomanage the patient. In another case study, core/low back stabilization exercises, bridging, lower trunk rotation, SLR, mini squats clams, and soft tissue massage to the bilateral gluteals and lumbar paraspinal were used as a treatment for a patient with chronic low back pain [3]. After the application of the treatments stepwise, sitting-standing posture was corrected, shift subsided and muscle power re-gained G-IV (MMT) than before. In so far as the patient is managed under either the mobilization/manipulation subgroup or the self-exercise/lateral shift correction subgroup, which reflects the treatment-based classification. It is challenging to prove which type of intervention was responsible for the relief of pain in this case study.

Limitation: As it is a case report, it is difficult to draw assumptions about causality and consequences. Although the patient's pain and impairment improved, it is unclear which component of the whole session was most useful, why this strategy was beneficial, and to what extent natural history was responsible for her recovery.

CONCLUSION

The current case report has documented a successful treatment of the patient with an alternating LLS who responded quickly.

Abbreviations

CLBP: Chronic Low Back pain,
LBP: Low back pain,
ROM: Range of motion,
LLS: Lumber Lateral shift,
BPFS: Back Pain Functional Scale
NPRS: Numeric Pain Rating scale,
SLR: Straight Leg Raise,
CRP: Centre for the Rehabilitation of the Paralysed

Conflicts of interest: The author(s) declared no conflicts of interest with respect to the authorship and/or publication of this article.

AUTHOR'S CONTRIBUTION

Md Golam Kibria: Devised the project, the main conceptual ideas and proof outline. Worked out almost all of the therapeutic design, and performed the numerical calculations for the suggested case.

Nusrat Jahan Sonia: Contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

Atqiya Antara: Designed and performed the physiotherapy session, derived the models and analyzed the outcome measurement tool also wrote the manuscript in consultation with other authors.

Md Mostafijur Rahman: Critically examining the work for significant intellectual substance, final approval of the published version, be willing to accept responsibility for all parts of the work.

Abdullah Ibn Abul Fazal: Conceived of the presented idea, developed the theory and verified the assessment tools, also verified the analytical methods, encouraged to investigate and supervised the findings of this work.

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