



## Early Postoperative Physical Rehabilitation with Additional Tele Rehabilitation in Case of Lumbar Discectomy: A Case Report

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### ABSTRACT:

Low back pain (LBP) is one of the most prevalent conditions that significantly impair daily living activities and make them more difficult to perform. Therefore, it is imperative to treat LBP as soon as possible. Telerehabilitation is viewed as a potential alternative, especially in geographically remote areas where medical professionals are scarce and rehabilitation services are lacking. Accordingly, this case report details the effects of PHYSICAL REHABILITATION WITH ADDITIONAL TELEREHABILITATION on a 61-year-old female patient who presented with the primary complaint of LBP for the previous year and who underwent lumbar discectomy. The patient complained of difficulty performing activities and being unable to sit for extended periods of time. After four weeks, the patient was unable to regularly visit the outpatient department, therefore the physiotherapeutic rehabilitation was virtually provided through online sessions. Results after the intervention showed improved quality of life, less disability, less discomfort, more muscle strength, and increased range of motion and flexibility. Thus, it can be said that telerehabilitation in conjunction with physical therapy presents a fresh way to broaden access to rehabilitation treatments.

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## 1. Introduction

Musculoskeletal (MSK) disorders place a heavy cost on society worldwide. The Global Burden of Disease (GBD) study included 291 diseases, with low back pain (LBP) ranking highest in terms of disability.<sup>(1)</sup>

In all developed nations, low back pain is a significant health issue that is primarily managed in basic healthcare settings. It is commonly described as localized discomfort, stiffness, or muscular tension above the inferior gluteal folds and below the costal border, either with or without sciatica, or leg pain. Pain and impairment are the main signs of non-specific low back pain.<sup>(2)</sup>

Approximately 10% of the population suffers from lumbar prolapsed intervertebral disc (PIVD) or herniation, which is one of the most common musculoskeletal illnesses. The majority of those affected are between the ages of 30 and 50, with men having a higher prevalence than women. Risk factors include socioeconomic circumstances, smoking, obesity, and sedentary behavior. When compared to other regions, the lumbar region has the highest frequency of disc prolapse, which is most common at the L4-L5 and L5-S1 levels. A common and often incapacitating symptom is radicular pain. It renders the person unable and may cause sensory and motor deficiencies.<sup>(3)</sup>

The term "spinal stenosis" describes a narrowing of the spinal canal that results in clinical symptoms that are brought on by radicular or spinal cord compression. Anatomically small canals are frequently asymptomatic, hence it is important to distinguish between them and clinical complaints. Spinal stenosis can be unilateral or bilateral, monosegmental or multisegmental, and affect the cervical, thoracic, or lumbar spine.<sup>(4)</sup>

Lumbar disc disease is a degenerative condition which is most common cause of low back pain worldwide. The symptoms of lumbar disc degenerative disease can include facet joint arthropathy, lumbar spinal stenosis, disc herniation, or any combination of these. Herniation happens when nuclear materials pierce the annulus radially and protrude or extrude into the perineural space. Any form of spinal canal, nerve root canal, or intervertebral foramina narrowing is known as lumbar spinal stenosis.<sup>(5)</sup>

### Case Presentation

For a period of 12 months, a 61-year-old woman had been experiencing chronic, progressively increasing low back pain that was radiating to her left leg. For the preceding 12 months, neither relaxation nor medication was able to relieve the pain. In the same region, she also felt tingling and numbness. The patient's history of excessive weight lifting contributed to her pain, and she is obviously distraught about not being able to do her daily chores because of her pain. On a visual analogue scale (VAS), she gave the pain an 8 out of 10. There is tingling, radiating discomfort, and a gait issue related to the pain. The symptoms worsen when one does things like stand up after sitting.

The patient's past medical history dates back two years, and they had been taking regular medicine for hypertension. She had an angiography procedure a year ago. The visually assessed lumbar ranges of motion were found to be uncomfortable and limited during physical testing. Upon soft tissue examination, the quadratus lumborum, lateral gastrocnemius, and bilateral lumbar erector spinae were found to be both painful and tight. The patient was recommended to have an MRI and an X-ray, among other tests and examinations. MRI of lumbo sacral spine stated that at L3-4 level: Diffuse disc bulge with left facet joint arthropathy indenting anterior thecal sac and bilateral traversing nerve roots. There is mild narrowing of bilateral neural foramina indenting bilateral exiting nerve roots.

L4-5 level: Central disc extrusion on background of diffuse disc bulge compressing thecal sac and bilateral traversing nerve roots causing severe canal stenosis. There is narrowing of bilateral neural foramina severely compressing bilateral exiting nerve roots.

Ligamentum flavum hypertrophy at multiple levels in dorsal spine.

### **Diagnosis**

The surgical procedure performed for this case was L4 -L5 lumbar Discectomy.

### **Therapeutic Intervention**

The patient was treated by a multidisciplinary team consisting of physicians, nurses, and physiotherapists in order to achieve a favorable prognosis. For eight weeks, the patient attended physical therapy sessions six days a week with the help of telerehabilitation. Physical therapy interventions were designed with functional desirable outcomes in mind, with the primary objectives being to enhance the patient's quality of life and avert future difficulties.

### **Treatment Protocol**

#### **Phase 1 (0-2 Weeks)**

- Patient education
- For pain reduction – Ice pack & Conventional TENS
- Static backs (5 sec hold) (10-15 reps)/ 1 set
- Static quads (5 sec hold) (10-15 reps)/ 1 set
- Static hams (5 sec hold) (10-15 reps)/ 1 set
- Bed mobility – Transfer with proper spine positioning
- Correctly performing activities of daily living.
- Corrective use of assistive devices
- Ambulation -parallel bar walking.

#### **Phase (2-4 Weeks)**

- Correct posture
- Ambulation ( endurance) – walking / treadmill( 5-10 min)
- Discontinuing assistive devices
- Strengthening ( leg , core, back)
- Use of light weight, dynamic quads (10 reps)/2 set.
- Resistance band exercises
- Wall squats (10 reps)/ 2 set
- Supine abdominal crunches (10 reps)/ 1 set
- Side lying hip abduction (10 reps)/ 1 set
- Prone hip extension (10 reps)/ 1 set
- Flexibility – soft tissue mobilization for paraspinal muscles
  - Stretching bilateral lower limb ( 30 sec hold)/3 reps.
  - Active movement
- Gait training – side walking
  - Obstacle walking

#### **Phase 3 (4-8 Weeks) (Tele-rehabilitation)**

- Progress strength endurance
- Aerobic conditioning -spot marching
- Core strengthening -pelvic bridging (10 reps)/ 2 set
- Abdominal isometrics (10 reps)/ 2 set
- Bird dog exercises (10 reps)/ 2 set
- Lower limb strengthening- stability ball wall squats (10 reps)/ 2 set
- 1) Standing hip abduction &

- 2) Extension
- 3) Lunges
- 4) Lateral band walks
  - Balance – stable / unstable surfaces
  - Double leg (eyes open / eyes closed)
  - Single leg (eyes open/ eyes closed)
  - Upper extremity movement – stable / unstable surfaces
  - Begin light ergonomics & stimulated work
- Activites
  - self stretching (30 sec hold)/3 reps

Patient performing abdominal curls



Patient performing pelvic bridging



Patient performing straight leg raise



### **Follow Ups with Tele Rehabilitation**

Patient performing Dynamic Quads



Patient standing independent without any support



**Outcome Measures**

Sr.no	Outcome measures	POD 1	Postoperative after 8 weeks
1	Oswestry disability index	43( complete disabled)	22( moderate disability)
2	Back pain Functional Scale	5	23
3	RMDQ Scale	21/24	5/24
4	Berg Balance Scale	10/56	39/56
5	VAS	8/10	3/10
6	<b>RANGE OF MOTION</b>		
<b>A</b>	<b>Lumbar Spine</b>	POD 1	After 8weeks
	a. Flexion	15	40
	b. Extension	5	12
	c. Rotation- right	2	5
	d. Rotation – left	3	5
	e. Lateral flexion -right	7	16
	f. Lateral flexion -left	9	16
<b>B</b>	<b>Right Hip Joint</b>		
	a. Flexion	80	100
	b. Extension	10	13
	c. Adduction	25	30
	d. Abduction	30	40
	e. Internal rotation	20	35
	f. External rotation	30	50
<b>C</b>	<b>Left hip Joint</b>		
	a. Flexion	70	100

	b. Extension	12	14
	c. Adduction	25	30
	d. Abduction	30	45
	e. Internal rotation	20	30
	f. External rotation	30	45
7	<b>MMT ACCORDING TO MRC GRADING</b>		
<b>A</b>	<b>Lumbar Spine</b>	POST OPERATIVE 1 week	AFTER 8 WEEKS
	a. Lumbar flexion	Grade 1	Grade 3
	b. Lumbar extension	Grade 1	Grade 3
	c. Lumbar rotation- right	Grade 1	Grade 3
	d. Lumbar rotation - left	Grade 1	Grade 3
	e. Lumbar lateral flexion -right	Grade 1	Grade 3
	f. Lumbar lateral flexion -left	Grade 1	Grade 3
<b>B</b>	<b>Right Hip Joint</b>		
	a. Hip flexors	Grade 4	Grade 4
	b. Hip extensors	Grade 4	Grade 4
	c. Hip adductors	Grade 4	Grade 4
	d. Hip abductors	Grade 4	Grade 4
	e. Hip medial rotators	Grade 4	Grade 4
	f. Hip lateral rotators	Grade 4	Grade 4
<b>C</b>	<b>Left hip joint</b>		
	a. Hip flexors	Grade 4	Grade 4
	b. Hip extensors	Grade 4	Grade 4
	c. Hip adductors	Grade 4	Grade 4
	d. Hip abductors	Grade 4	Grade 4
	e. Hip medial rotators	Grade 4	Grade 4
	f. Hip lateral rotators	Grade 4	Grade 4

## 2. Discussions

In this study after providing eight weeks of interventions and tele rehabilitation, the patient had improved significantly, and by the end of the ninth and further weeks of rehabilitation, more gains were anticipated. The Ohio State University Wexner Medical Center post-operative lumbar discectomy Treatment Guideline was cited in our situation, and we followed its predetermined approach for the procedure.<sup>(7)</sup> In addition to telerehabilitation, this protocol produced positive outcomes in the patient up until the point of discharge. The patient also received post-discharge exercise and ergonomics. After treatment, the patient underwent follow-up to assess ongoing progress, her lower extremity and lumbar joint range of motion significantly improved. Her muscle strength and balance improved.

Additionally, the patient was happy with the result. Early, planned, evidence- and protocol-based rehabilitation has been demonstrated to be helpful in symptom reduction, promoting functional independence, and enhancing capacity for daily living tasks.

## 3. Conclusions

The effectiveness of supervised physical therapy rehabilitation in treating patients who have had lumbar discectomy is highlighted in this case study. Reducing post-operative problems, physiotherapeutic treatments shown a considerable improvement in outcome measures.

### **Informed Consent**

Informed consent of patient is taken

### **Acknowledgement**

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