

# Reversing the Curve: A Case Report on Managing Reversed Cervical Lordosis with Physical Therapy

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## ABSTRACT

**Background:** Reversed cervical lordosis is a spinal deformity in which the normal inward curvature of the cervical spine is altered, straightened, or reversed. This can cause severe pain and functional impairment. While many treatments have been recommended, ranging from physical therapy modalities to alternative methods, very few studies have evaluated the effectiveness of these interventions. **Aim:** It was to evaluate the effectiveness of physical therapy modalities in treatment a case of reversed cervical lordosis. **Case Presentation:** A case of a 63-year-old male with reversed cervical lordosis, disc bulges, and associated cervical pain treated with physical therapy was reported. MRI findings have shown multiple posterior disc bulges from C3/4 to C6/7, which were causing compression on the Cerebrospinal Fluid (CSF) space and spinal cord. **Intervention:** The course of treatment included Transcutaneous Electrical Nerve Stimulation (TENS), ultrasound, manual massage, manual cervical traction, and exercises for home use. **Results:** The patient cleared significant pain relief (Numerical Pain Scale reduction from 8/10 to 4/10) and improvement in range of motion after four treatment sessions. **Conclusion:** The current case emphasizes the effectiveness of physical medicine and rehabilitation in treating reversed cervical lordosis with associated disc bulges. Further researches are required in order to confirm treatment in similar cases with these therapeutic modalities.

**Keywords:** Reversed lordosis, Cervical lordosis, Pain management, Cervical disorders.

## INTRODUCTION

Cervical lordosis, according to *Lim J et al.* <sup>(1)</sup>, refers to the natural inward curve in the cervical spine necessary for appropriate neck function. Any alteration in this form may cause neck pain and headaches and a generally diminished quality of life. Cervical lordosis located between the cranium and the rigid thoracic spine, the cervical spine allows for a wide range of motion and absorbs various stresses: torsional, axial, and shear forces. Normally, it assumes a lordotic curve.

Interestingly, a 2018 meta-analysis including 15,364 asymptomatic individuals, reported that 36% of them did not have a lordotic curve. Furthermore, factors including age and gender also affect cervical alignment <sup>(2)</sup>. Cervical lordosis loss has increased in frequency in recent years, primarily as a result of sedentary habits like watching TV for extended periods of time. This lifestyle change has greatly increased the risk of cervical spondylosis <sup>(3)</sup>. *De Oliveira et al.* <sup>(3)</sup> studied 769 participants aged 18–59 years and found that increased smartphone usage was strongly linked to changes in head alignment, which in turn affected neck posture and caused pain. Until now, only one case has been reported—that of a 57-year-old lady with severe neck pain rating to 8/10 <sup>(4)</sup>. Transcutaneous Electrical Nerve Stimulation (TENS) and ultrasound are two physical therapy techniques that have shown some potential in the treatment of pain. To lessen discomfort, TENS reduces the central nervous system's excitability <sup>(5)</sup>. For cervical spine diseases, manual therapy and strengthening exercises have also resulted in notable improvements in function and pain reduction <sup>(6)</sup>.

Case details and related photos were released only after obtaining informed consent from the patient.

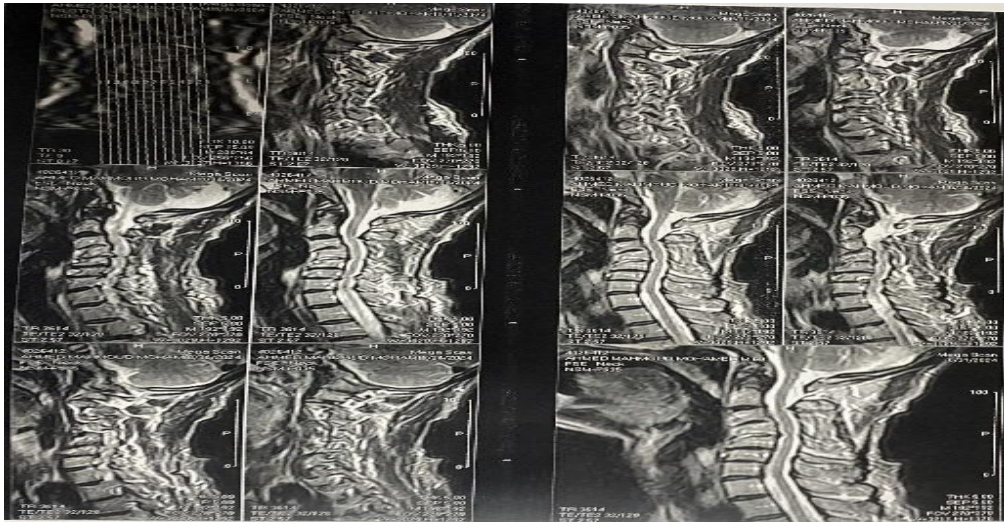
Institutional Review Board (IRB) approval was exempted since this was a retrospective review <sup>(7)</sup>.

The objective of this study is to respond to a gap in literature based on such cases. So, the aim of this case study is to evaluate the new treatment approach that can lead to huge benefits for the similar cases.

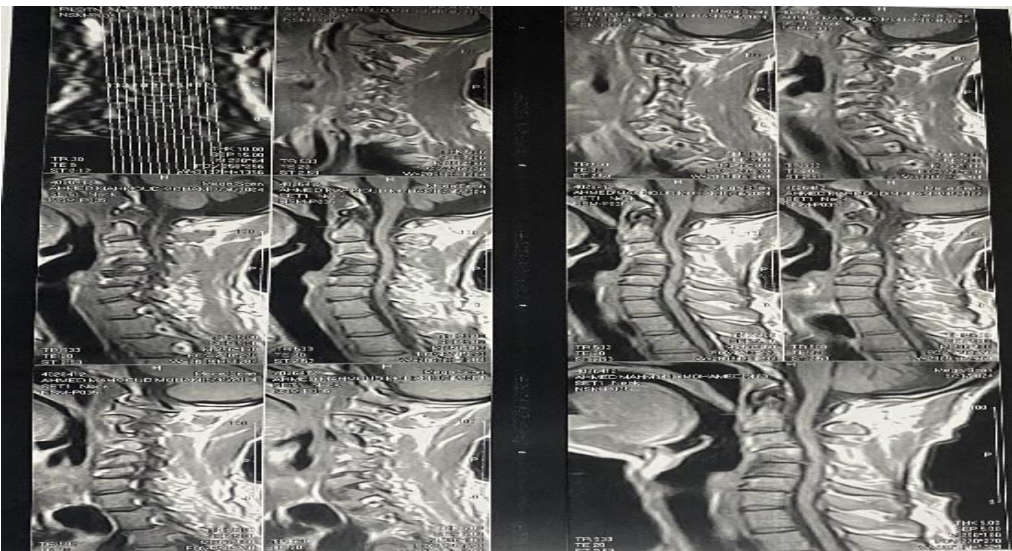
## CASE PRESENTATION

The Physical Therapy Clinic received a complaint from a 63-year-old man on September 12, 2024, regarding neck pain that was mainly limited to the C4-C5 intervertebral region. The pain, which increased with cervical extension, was associated with numbness in the left shoulder. No prior history of cervical trauma, osteoporosis, diabetes mellitus, or hypertension was found in the medical history. Upon inspection, it was discovered that cervical extension was decreased and left head rotation was restricted in comparison to right. Both sternocleidomastoid muscles were tense when the cervical region was palpated. He also reported numbness over the deltoid region of the left shoulder. Pain was rated 8/10 on the Numerical Pain Scale <sup>(8)</sup> and significantly disturbed his sleep and activities of daily living. MRI of the cervical spine on August 31, 2024, with sagittal T1, T2, and axial GR/T2-weighted images without contrast, revealed (Fig. 1 for sagittal view).

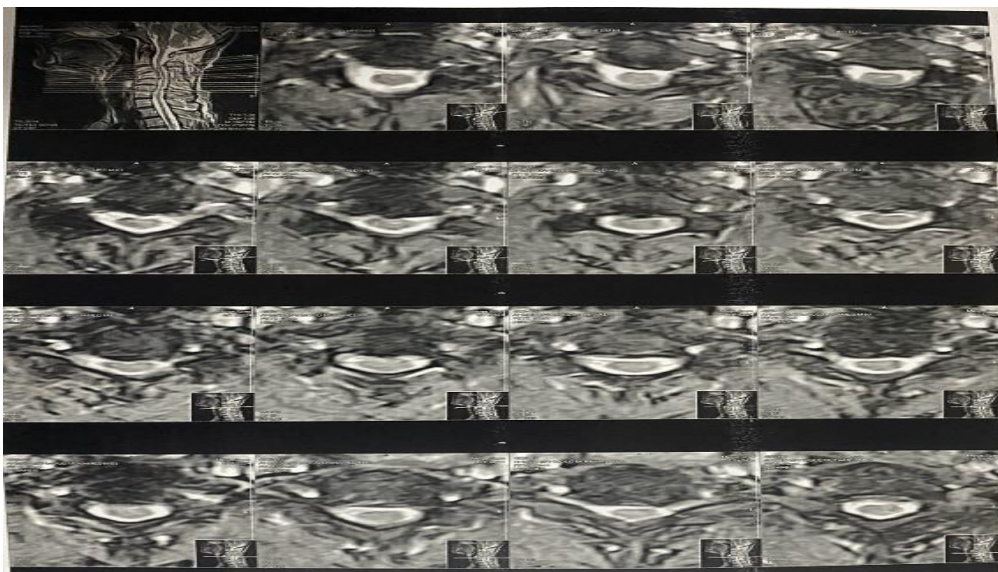
- Straightened cervical curvature mounting to reverse.
- C3/4 to C5/6 posterior disc bulges compressing the anterior Cerebrospinal Fluid (CSF) space and abutting the ventral spinal cord (Fig. 2).
- Mild posterior disc bulge at C6/7, encroaching on the anterior CSF space.
- Minimal marginal osteophytosis and marrow degenerative changes at the vertebral endplates.
- No abnormality detected in the paraspinal soft tissue.



**Figure (1):** Sagittal cervical radiographs. T2 (C3/C4) Down to (C6/C7) Posterior Disc Degenerative Lesion with Reversed Cervical Lordosis Curve.



**Figure (1):** Sagittal cervical radiographs. T1 (C3/C4) Down to (C6/C7) Posterior Disc Degenerative Lesion with Reversed Cervical Lordosis Curve, No abnormality detected in the paraspinal Soft Tissue.



**Figure (2):** Axial cervical radiographs.

## Treatment Plan

On September 12, 2024, the patient started going to the physical therapy class on alternate days. The physical therapy incorporated into the case is enumerated below:

1. **TENS:** Bilateral electrodes were placed on the cervical spine, and high-frequency TENS 130 Hz was applied for 20 minutes.
2. **Hot Bag Therapy:** A hot bag was placed on the anterior cervical area to promote relaxation of the sternocleidomastoid muscles.
3. **Ultrasound Therapy:** Use a circular technique at a frequency of 1 MHz and a power setting of 1.2 mW/cm<sup>2</sup> for five minutes on each side to reduce muscle stiffness.
4. **Manual Massage:** Directed at the cervical paraspinal muscles as well as myofascial pain areas.
5. **Manual Cervical Traction:** Mulligan's technique <sup>(9)</sup> was performed in a range of 2-7 minutes.
6. **Ice Therapy:** Applied post-session to the neck area that is most painful.
7. **Strengthening Exercises:** Deep neck flexors by static contractions to tolerance.

## Home Care Instructions

The following home care instructions were given to the patient:

- Apply ice wrapped in cloth for 8-15 minutes, up to three times daily, with 6-8 hours between applications.
- Adjust the pillow to support the corrected cervical posture during sleep.
- Take muscle relaxants or anti-inflammatory medication before bed if there is persistent pain.

## RESULTS

By the fourth session, the patient showed significant improvement. The pain intensity reduced from 8/10 to 4/10, with the return of cervical rotation and an improvement in cervical extension to fifty percent of the normal range of movement without pain. In addition, the numbness in the left shoulder significantly reduced.

## DISCUSSION

Reversed cervical lordosis is emerging, with only one previous case report, published in the year 2021 by **Chu ECP (2021)** <sup>(4)</sup>. Now, in the year 2024, here comes another case study. The question can be asked: why is this infrequent condition presenting itself to us now? Many studies have linked this to the sedentary lifestyle of modern times and excessive usage of technology that affects alignment of the cervical spine as smartphone <sup>(3, 2)</sup>.

This study therefore brings into perspective the early conservative management for such cases. The treatment package included TENS, ultrasound, manual therapy, and strengthening exercises, all performed symptomatically for the patient. Indeed, similar

methods have reported promising results in studies related to cervical spine disorders <sup>(10, 11)</sup>.

However, the short-term application of these interventions limits the generalizability of this protocol. To confirm the effectiveness of this management program, further long-term studies are recommended.

## LIMITATIONS

This study was constrained by the short treatment period (four sessions), a situation compounded by the social circumstances of the patient and his frequent travel commitments. Moreover, financial constraints prevented the use of more sophisticated diagnostic tools to monitor progress, and therefore the study had to rely on simple pain assessment tools, such as the Numerical Pain Scale.

## CONCLUSION

This case demonstrates the potential benefits of a multimodal physical treatment approach in the treatment of reversed cervical lordosis with associated disc bulges. The patient demonstrated dramatic improvement in pain levels and functional ability within four sessions of treatment. There is scant research into standardized treatment strategies for this condition, but the outcome of this study is encouraging.

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- **Funding:** None.
- **Conflict of interest:** None.
- **Consent to publish declaration:** Not applicable.
- **Declaration of Patient Consent:** The author certifies that appropriate patient consent was obtained, and the patient's identity has been adequately protected.

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