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## A Case of Cervical Radiculopathy: Prognosis and Role of Physiotherapy.

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### ABSTRACT

Cervical radiculopathy leads to neck and radiating arm pain or numbness in the distribution of a specific nerve root. Often this radicular pain is accompanied by motor or sensory disturbances. There are various causes of radiculopathy, such as acute disk herniation; cervical spondylosis; and foraminal narrowing. However, all these causes lead to compression and irritation of an existing cervical nerve root. Non-invasive interventions showed beneficiary effect in the subject in our case. This case reiterates role of aggressive nonsurgical treatment in the successful management of cervical radiculopathy.

**Keywords:** Cervical radiculopathy, non-invasive treatment, rehabilitation

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## INTRODUCTION

Cervical radiculopathy leads to neck and radiating arm pain or numbness in the distribution of a specific nerve root. Often this radicular pain is accompanied by motor or sensory disturbances. There are various causes of radiculopathy, such as acute disk herniation; cervical spondylosis; and foraminal narrowing. However, all these causes lead to compression and irritation of an existing cervical nerve root [1]. The surgical interventions in case of cervical radiculopathy pose risks to the patients. Hence, this case suggests opting for aggressive nonsurgical treatment (rehabilitation therapy along with pharmacotherapy) in the successful management of cervical radiculopathy.

### Case report

A 36 years old male patient presented to outpatient department (OPD) of orthopedics department of a private hospital in Chennai with chief complaints of pain in the left arm initially and later a sharp, burning pain over the neck for 2 months. Pain was progressive in nature, associated with tingling sensation and used to increase at the end of the day and relieved with rest.

On physical examination, muscle spasm was there in the back of the neck. On sensory testing the patient responded to light touch and pain; motor testing revealed loss of muscle mass over the left arm and weakness; quadrant sign and shoulder abduction signs were positive.

**Figure 1: Magnetic resonance imaging (MRI) image of C5-6 and C6-7 discs.**



The patient was advised X-ray of the left arm and an Electrocardiogram (ECG), to rule out cardiac problem due to pain in the left arm. The X-ray and the reports were found to be normal. The case was diagnosed to be brachial neuralgia. Magnetic resonance imaging (MRI) examination was recommended. The subject was examined at 1.5 T using axial and sagittal images acquired with 2D T2, T1W; T2W and STIR coronal (Figure 1). MRI revealed loss of

cervical lordosis with desiccated C5-6 and C6-7 discs. Left posterior paracentral broad based protrusion of C6-7 disc indented the thecal sac and the left nerve root and caused left foraminal narrowing. Mild right posterior paracentral protrusion of C6-7 disc indented the thecal sac and closely abuted/indented the exiting right nerve root (Figure 1).

Initially the patient was recommended bed rest, analgesics and muscle relaxants but the pain was not relieved. Then subject consulted a sports orthopaedician who diagnosed the case to be cervical radiculopathy. He was recommended six weeks of rehabilitation therapy by the physician in his own clinic through a self motivated, highly competent, result oriented physical therapist.

Six weeks later the patient came for follow up and was found to be asymptomatic. On physical examination, quadrant sign and shoulder abduction sign was negative. Further, power in the muscles became normal and no sensory loss was seen.

### DISCUSSION

Studies have shown spontaneous regression of cervical radiculopathy by non-operative management. In a one year cohort study of 26 patients with documented herniated nucleus pulposus and symptomatic radiopathy, a focused, non-operative treatment program was successful in 92% of the patients [1].

In this case, the patient was initially on medication. He took opioid analgesic (Tramadol), muscle relaxant (Chlorzoxazone) and antidepressant (venlafaxine) but the effect was minimal. So the patient was treated with six weeks rehabilitation therapy consisting of therapeutic ultrasound, shoulder and neck mobilization, stretching exercise, electrotherapy [Transcutaneous Electrical Nerve Stimulation (TENS)] and manual traction along with pharmacotherapy. Rehabilitation therapy underwent is shown on Table 1.

**Table 1: Rehabilitation therapy underwent by the subject**

<b>1<sup>st</sup> week</b>	<ul style="list-style-type: none"> <li>• Therapeutic ultrasound</li> <li>• Manual traction (20 sec pull for 10 times)</li> <li>• Stretching exercise</li> <li>• Shoulder mobilization</li> </ul>
<b>2<sup>nd</sup> week</b>	<ul style="list-style-type: none"> <li>• Manual traction</li> <li>• Neck and shoulder mobilization</li> <li>• Stretching exercise</li> <li>• Transcutaneous electrical nerve stimulation (TENS)</li> </ul>
<b>3<sup>rd</sup> week</b>	<ul style="list-style-type: none"> <li>• Neck stretching exercise, Therapeutic ultrasound and Traction</li> </ul>
<b>4<sup>th</sup> week</b>	<ul style="list-style-type: none"> <li>• Manual traction and stretching exercise</li> </ul>
<b>5<sup>th</sup> week</b>	<ul style="list-style-type: none"> <li>• Manual traction and stretching exercise</li> </ul>
<b>6<sup>th</sup> week</b>	<ul style="list-style-type: none"> <li>• Neck stretching exercise</li> </ul>

The patient's neck pain was measured every week with Numerical Pain Rating Scale (NPRS) using 11-point scale ranging from 0 (no pain) to 10 (worst pain imaginable). The patient was asked to evaluate the intensity of neck pain every week [2]. Before starting the rehabilitation therapy the patient's pain score was 9. At the end of 1<sup>st</sup> week it came down to

7. At the end of 2<sup>nd</sup> as well as 3<sup>rd</sup> week it was 5, 4<sup>th</sup> week it was 2. At the end of 5<sup>th</sup> and 6<sup>th</sup> week patient score was 0.

Therapeutic ultrasound has been used extensively to treat a variety of conditions and in this case it was used for muscle spasm. A temperature of 2° - 3°C and ultrasound frequency of 3-MHz reduces muscle spasm, pain, chronic inflammation and increases blood flow [3]. Therapeutic ultrasound was applied to the patient for initial three weeks.

Stretching exercise also plays an important role in maintaining and restoring range of motion. There are different types of stretching exercises, namely, passive, active-assisted, active and facilitated stretching [4]. Here the patient was initially started with passive exercise and slowly continued to active stretching exercise when the patient's pain scale score had reduced to zero. Before starting the stretching exercise, the patient was asked to do warm up exercise for few minutes.

TENS is commonly used noninvasive non-pharmacologic treatment for pain. It can be applied with varying frequencies (low - <10 Hz, high - >50 Hz). TENS reduces pain through both peripheral and central mechanism. Centrally, TENS activate opioid, serotonin and muscarinic receptors present in spinal cord and brain stem. Peripherally, TENS activates opioid and  $\alpha_2$  noradrenergic receptors to induce analgesia [5]. Both low and frequency TENS was applied to the patient at 2<sup>nd</sup> week.

Cervical traction is also sometimes used as a non-invasive procedure for cervical radiculopathy. Cervical radiculopathy is a result of intervertebral disk prolapse, where nerve roots are compressed causing entrapment within the intervertebral foramina. The irritant nerve produces a reflex response to the patient's cervical muscles, causing those muscles to contract. That contraction further narrow's the foramina and the neck pain is increased. Intermittent traction helps to relieve the inflammatory reaction of nerve roots by improving the circulation and reduction of swelling of the tissues [6]. The subject in our case was given manual cervical traction (therapist used her hands to manually pull on subjects neck and provide a traction force for 20 seconds), ten times every day for five weeks.

### CONCLUSION

With the help of non-invasive interventions along with pharmacotherapy the patient's neck pain was reduced and according to NPRS it came down to zero after the rehabilitation therapy. Patient was able to do his day to day activity after the therapy which was restricted before the rehabilitation therapy. Non-invasive interventions showed beneficiary effect in this case. This case reiterates role of aggressive nonsurgical treatment in the successful management of cervical radiculopathy.

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