

Postoperative C5 Palsy Following Posterior Cervical Decompression and Fusion: A Case Report

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Learning Point of the Article:

Early recognition of postoperative C5 palsy following posterior cervical decompression and fusion, with prompt rehabilitation and close follow-up, can optimize neurological recovery and functional outcomes.

Abstract

Introduction: Posterior cervical decompression and fusion (PCDF) is a well-established surgical procedure for the management of multilevel cervical spinal cord compression. Although generally safe, postoperative C5 palsy is a recognized complication that can significantly affect functional recovery.

Case Report: We report the case of a patient with multilevel cervical compressive myelopathy who underwent posterior cervical decompression and fusion. The immediate postoperative period was complicated by new-onset weakness of shoulder abduction and elbow flexion, consistent with C5 palsy. Postoperative imaging confirmed satisfactory decompression and appropriate implant positioning, with no evidence of hematoma or hardware-related complications. The patient was managed conservatively with close neurological monitoring and a structured rehabilitation program.

Discussion: The exact mechanism of postoperative C5 palsy remains unclear, with proposed causes including posterior shift of the spinal cord, nerve root traction, ischemia, and reperfusion injury. Early recognition, exclusion of compressive causes, and rehabilitation are essential for optimal recovery.

Conclusion: C5 palsy is an uncommon but important complication following PCDF. Prompt diagnosis, appropriate imaging, and multidisciplinary rehabilitation are crucial to maximize neurological recovery and improve functional outcomes.

Categories: Neurology, Neurosurgery, Orthopedics

Keywords: C5 palsy, case report, cervical myelopathy, cervical spine surgery, cervical spondylotic myelopathy, posterior cervical decompression and fusion (PCDF), posterior cervical fusion, postoperative neurological deficit, rehabilitation, spine surgery

Introduction

Degenerative cervical myelopathy (DCM) is the most common cause of spinal cord dysfunction in adults worldwide and results from progressive compression of the cervical spinal cord secondary to degenerative changes such as intervertebral disc degeneration, osteophyte formation, hypertrophy of the

ligamentum flavum, and facet joint arthropathy [1,2]. Patients commonly present with gait instability, hand clumsiness, upper limb weakness, paresthesia, and upper motor neuron signs, leading to progressive functional impairment if left untreated [2,3].

Magnetic resonance imaging (MRI) is the gold standard for

Access this article online

Website:
www.jocr.co.in

DOI:
<https://doi.org/10.13107/jocr.2026.v16.i08.7884>

Author's Photo Gallery



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Submitted: 02/05/2026; Review: 18/06/2026; Accepted: July 2026; Published: August 2026

DOI: <https://doi.org/10.13107/jocr.2026.v16.i08.7884>

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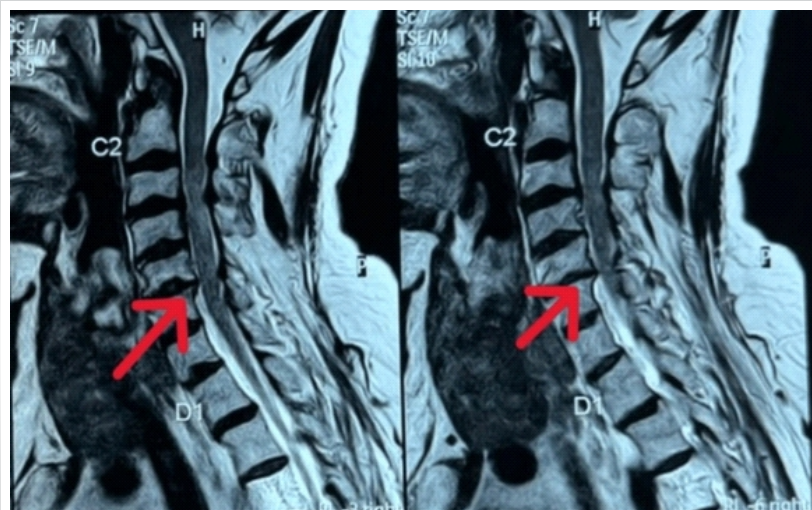


Figure 1: Preoperative sagittal T2-weighted magnetic resonance image of the cervical spine. Mid-sagittal T2-weighted MRI demonstrating severe spinal canal stenosis and spinal cord compression at the C5–C6 level, with focal intramedullary T2 hyperintensity consistent with chronic compressive myelopathy (arrows)

diagnosing DCM because it accurately demonstrates the level and severity of spinal cord compression, associated intramedullary signal changes, and other pathological abnormalities that guide surgical planning [1,3]. Surgical decompression is recommended for patients with moderate-to-severe or progressive myelopathy, as it prevents further neurological deterioration and improves long-term functional outcomes [1].

Posterior cervical decompression and fusion (PCDF) is an established surgical option for patients with multilevel cervical spondylotic myelopathy, particularly in the presence of preserved cervical lordosis. It provides effective decompression of the spinal cord while maintaining cervical stability through instrumented fusion [4,5]. Although neurological recovery after surgery is generally favorable, postoperative C5 nerve root palsy remains a recognized complication that requires early identification and appropriate rehabilitation [6,7].

We present a case of multilevel cervical spondylotic myelopathy managed with PCDF, highlighting the clinical presentation, radiological findings, surgical management, postoperative C5 palsy, and functional recovery in the context of current literature [8].

Case Report

A 66-year-old woman presented with a 5-month history of progressive gait instability, recurrent falls, bilateral hand paresthesia, and right upper limb weakness. She also complained of difficulty

with fine motor activities, including buttoning clothes and writing. There was no history of trauma or bowel and bladder dysfunction. Her medical history was significant for hypertension, type 2 diabetes mellitus, and hypothyroidism.

On neurological examination, the patient had a spastic gait, grade 4/5 power in the right upper limb, hyperreflexia in both upper and lower limbs, bilateral Hoffmann's sign, and extensor plantar responses, consistent with cervical myelopathy.

Laboratory investigations revealed:

- Hemoglobin: 10.5 g/dL
- Erythrocyte sedimentation rate (ESR): 150 mm/hour
- HbA1c: 7.1%
- Thyroid-stimulating hormone (TSH): 6.33 μ IU/mL

Magnetic resonance imaging (MRI) of the cervical spine demonstrated severe spinal canal stenosis and spinal cord compression at the C5–C6 level, with focal intramedullary T2 hyperintensity suggestive of chronic compressive myelopathy (Figure 1).

Axial T2-weighted imaging at the same level demonstrated a posterior disc-osteophyte complex causing severe central canal stenosis with marked flattening of the spinal cord and near-complete effacement of the surrounding cerebrospinal fluid space (Figure 2).

Based on the clinical and radiological findings, a diagnosis of degenerative cervical myelopathy secondary to cervical

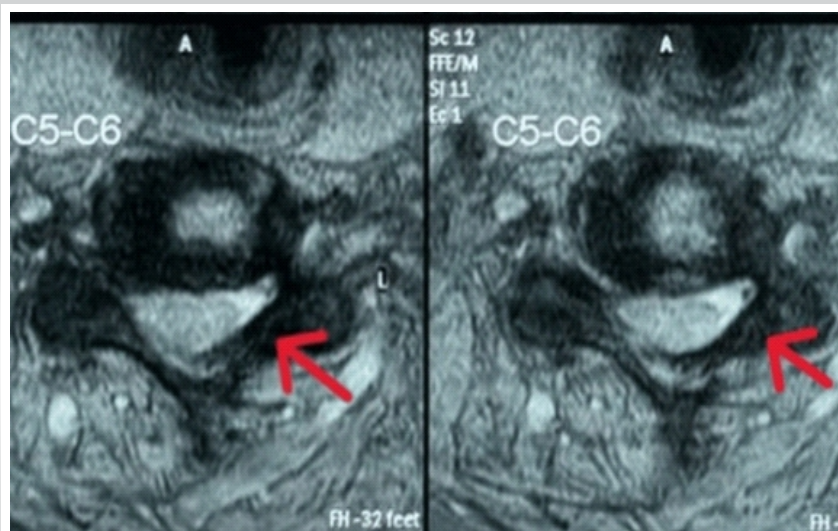


Figure 2: Preoperative axial T2-weighted magnetic resonance image at the C5–C6 level. Axial T2-weighted MRI demonstrating a posterior disc-osteophyte complex causing severe central canal stenosis with marked spinal cord compression and near-complete effacement of the surrounding cerebrospinal fluid (CSF) space (arrows).

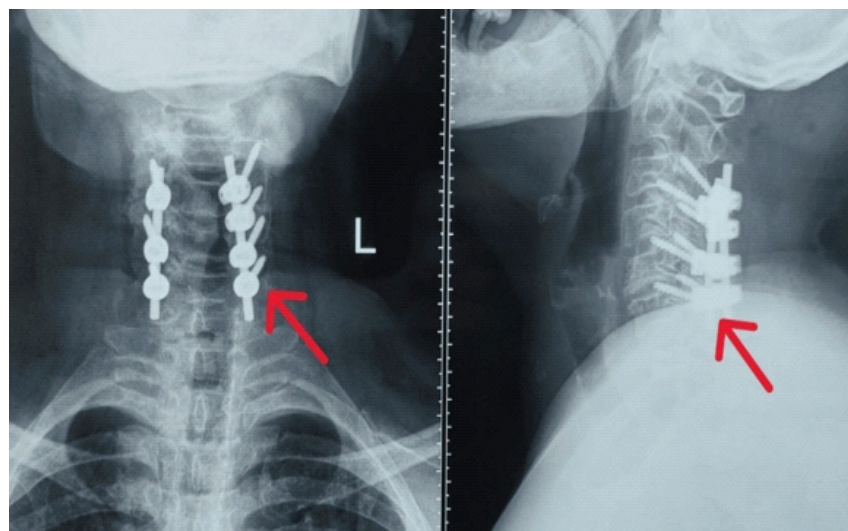


Figure 3: Postoperative radiographs following posterior cervical decompression and fusion. Postoperative anteroposterior and lateral radiographs demonstrating satisfactory C3–C7 lateral mass screw–rod fixation (arrows), maintained cervical alignment, and a stable posterior cervical fusion construct following posterior cervical decompression and fusion.

spondylosis was established. After medical optimization, the patient underwent posterior cervical decompression and fusion (PCDF) from C3 to C7 using lateral mass screw and rod fixation.

Postoperative radiographs demonstrated satisfactory placement of the instrumentation with maintained cervical alignment and a stable posterior fusion construct (Figure 3).

During the postoperative period, the patient developed weakness of shoulder abduction and elbow flexion, consistent with C5 nerve root palsy. She was managed conservatively with physiotherapy and rehabilitation.

The surgical wound healed uneventfully without evidence of infection (Figure 4).

At subsequent follow-up, the patient demonstrated gradual improvement in gait, upper limb strength, and hand function with continued physiotherapy.

Discussion

Degenerative cervical myelopathy (DCM) is the most common cause of spinal cord dysfunction in adults and results from progressive compression of the cervical spinal cord due to degenerative changes such as intervertebral disc degeneration, osteophyte formation, facet joint arthropathy, and hypertrophy of the ligamentum flavum. The natural history of DCM is characterized by gradual neurological deterioration, making early diagnosis and timely surgical intervention essential to prevent irreversible spinal cord injury and functional disability [1,2].

Our patient presented with progressive gait instability, bilateral

hand paresthesia, and upper limb weakness, which are characteristic clinical manifestations of DCM. Magnetic resonance imaging demonstrated severe spinal cord compression at the C5–C6 level with intramedullary T2 hyperintensity, indicating chronic cord injury. These findings align with previous studies by Kalsi-Ryan et al. and Badhiwala et al., who emphasized that MRI is the imaging modality of choice for confirming the diagnosis, assessing the severity of cord compression, and guiding surgical management [2,3].

The patient underwent posterior cervical decompression and fusion (PCDF), which is an established surgical procedure for multilevel cervical spondylotic myelopathy, particularly in patients with preserved cervical alignment. Posterior decompression effectively relieves spinal cord compression, while instrumented

fusion provides immediate stability, maintains cervical alignment, and reduces the risk of postoperative deformity. Edwards et al. reported that appropriate patient selection and surgical planning are critical determinants of successful neurological recovery following posterior cervical surgery [4]. Similarly, Hirabayashi and Satomi demonstrated favorable long-term neurological improvement following posterior



Figure 4: Postoperative wound at follow-up

decompression procedures in patients with multilevel cervical myelopathy [5].

A recognized complication following posterior cervical decompression is postoperative C5 nerve root palsy, which typically presents with weakness of shoulder abduction and elbow flexion. The reported incidence ranges from approximately 5% to 10%, although rates vary depending on the surgical technique and patient characteristics [6,7]. The exact pathophysiology remains uncertain, with proposed mechanisms including posterior migration of the spinal cord following decompression, traction injury to the C5 nerve root, reperfusion injury, and pre-existing foraminal stenosis [6,7]. In the present case, the patient developed postoperative C5 palsy but showed gradual neurological improvement with conservative management, including physiotherapy and structured rehabilitation, without requiring revision surgery.

Overall, this case highlights the importance of correlating clinical findings with MRI. These findings agree with current evidence supporting surgical decompression as the standard of care for patients with progressive degenerative cervical myelopathy [1,4,8]. Recent studies have also demonstrated favorable neurological recovery in patients with postoperative C5 palsy managed with structured rehabilitation and close follow-up [9,10].

Conclusion

Degenerative cervical myelopathy is a progressive neurological disorder in which early diagnosis and timely surgical intervention are essential to prevent irreversible spinal cord injury and improve functional outcomes. This case demonstrates that posterior cervical decompression and fusion (PCDF) is an effective treatment for multilevel cervical spondylotic myelopathy, providing adequate spinal cord decompression and stable fixation. Although postoperative C5 nerve root palsy remains a recognized complication, prompt diagnosis, appropriate rehabilitation, and close follow-up can result in satisfactory neurological recovery.

Careful patient selection, meticulous surgical technique, and early recognition of complications such as C5 nerve root palsy are critical for achieving favorable neurological and functional outcomes.

Clinical Message

Postoperative C5 palsy remains a recognized complication after posterior cervical decompression and fusion, even when surgery is technically satisfactory. Anticipation of this complication, meticulous surgical planning, early identification of postoperative deltoid and biceps weakness, exclusion of structural causes, and timely rehabilitation are critical for favorable neurological and functional outcomes.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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Conflict of Interest: Nil

Source of Support: Nil

Consent: The authors confirm that informed consent was obtained from the patient for publication of this article

How to Cite this Article

Prasad M, Sheshagiri V, Gurumurthy B, Darshan N, reddyMLS, Akhil A. Postoperative C5 Palsy Following Posterior Cervical Decompression and Fusion: A Case Report. *Journal of Orthopaedic Case Reports* 2026 August;16(08):318-322.

