

Cervicogenic Vertigo Associated with Cervical Osteophytes: A Case Report and Rehabilitation Approach

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Abstract

Cervicogenic vertigo is a clinical condition characterized by dizziness associated with cervical spine dysfunction. It is often under-recognized and may mimic vestibular disorders. We report a case of a 57-year-old female presenting with chronic vertigo, neck pain, and postural instability, unresponsive to vestibular suppressants. Imaging revealed cervical spondylotic changes with posterior uncovertebral osteophytes. The patient was managed with a structured rehabilitation program including cervical proprioceptive training, strengthening exercises, and vestibular rehabilitation. Significant improvement in symptoms was observed. This case highlights the importance of considering cervicogenic causes in persistent vertigo and the role of targeted rehabilitation.

Introduction

Vertigo is a common clinical complaint encountered in rehabilitation and general medical practice, with a wide range of potential aetiologies including vestibular, neurological, cardiovascular, and cervical causes. While vestibular disorders remain the most frequently identified source, a subset of patients present with persistent dizziness in whom standard vestibular and neurological evaluations are inconclusive. In such cases, cervicogenic vertigo should be considered as a possible diagnosis.^{1,2}

Cervicogenic vertigo is believed to arise from abnormal proprioceptive input originating from the cervical spine, particularly from the upper cervical segments. The cervical spine contains a high density of mechanoreceptors that contribute to head-eye coordination and postural control. Disruption of this proprioceptive input due to pain, muscle dysfunction, or degenerative changes can lead to a mismatch between cervical, vestibular, and visual sensory inputs, resulting in symptoms of dizziness, imbalance, and disorientation.^{2,3,4}

Degenerative changes of cervical spine, such as spondylosis and osteophyte formation, may further contribute to symptom generation through altered biomechanics, restricted mobility, and, in some cases, mechanical compression of adjacent vascular structures such as the vertebral artery. Although vascular compromise is less commonly demonstrated, it remains a potential contributing factor in selected patients.⁴

The diagnosis of cervicogenic vertigo is primarily clinical and remains one of exclusion⁶. It requires careful evaluation to rule out primary vestibular disorders, central neurological causes, and other systemic conditions. A thorough history, focused clinical examination, and appropriate imaging studies can aid in identifying cervical spine involvement. Recognition of this condition is important, as it has implications for targeted rehabilitation strategies and improved functional outcomes.^{3,5}

Case Presentation

A 57-year-old woman presented with a two-year history of recurrent vertigo associated with neck pain, cervical stiffness, postural instability, and recurrent falls. One of the falls had previously resulted in bilateral forearm fractures. She had received multiple courses of vestibular suppressants over this period with minimal symptomatic improvement. Persistent symptoms despite medical therapy prompted further evaluation for possible non-vestibular causes of dizziness. There was no significant past medical history or major comorbidity.

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On clinical examination, cervical range of motion was notably restricted, particularly during neck rotation and extension. No focal neurological deficits were identified. Cerebellar signs were absent, and Spurling's test was negative. Dix-Hallpike manoeuvre was not performed because of severe cervical spondylotic changes and concern regarding symptom exacerbation with neck positioning.

Routine blood investigations, electrocardiogram, and pure tone audiometry were within normal limits. Imaging of the cervical spine revealed degenerative changes. Plain radiographs demonstrated cervical spondylosis, while CT imaging showed anterior marginal and bridging osteophytes extending from C3 to C5 along with posterior uncovertebral osteophytes from C4 to C6 [Fig. 1]. MRI of the brain and spinal cord did not reveal any significant abnormality. CT angiography could not be performed because of a documented contrast allergy.

Based on the clinical presentation, imaging findings, and exclusion of vestibular and central neurological causes, a diagnosis of cervicogenic vertigo secondary to cervical spondylosis with osteophyte formation was made.

The patient underwent a structured rehabilitation program. Initial management included short-term use of a soft cervical collar, nonsteroidal anti-inflammatory drugs, vestibular suppressants, patient education, and reassurance. Vestibular suppressants were gradually tapered during the course of rehabilitation.

The rehabilitation program focused on postural correction, cervical proprioceptive retraining, strengthening exercises, and vestibular rehabilitation. Postural and ergonomic interventions included correction of forward head posture and modification of aggravating activities. Cervical proprioceptive training involved laser pointer-based joint position sense

retraining exercises. Strengthening exercises targeted the deep neck flexors and scapular stabilizers to improve cervical stability and posture. Vestibular rehabilitation consisted of habituation exercises and gaze stabilization training.

Over the course of rehabilitation, the patient reported a significant reduction in vertigo episodes along with improvement in balance and neck pain. No further falls were reported during follow-up.

Discussion

Cervicogenic vertigo remains a diagnosis of exclusion and is often underdiagnosed. This is partly due to the overlap of symptoms with vestibular and central causes of dizziness, as well as the absence of definitive diagnostic tests^{2,3}.

The pathophysiology is believed to involve altered cervical proprioceptive input affecting vestibular processing. The upper cervical spine, rich in mechanoreceptors, plays a crucial role in sensorimotor integration, and dysfunction in this region can lead to a mismatch between cervical, visual, and vestibular inputs, resulting in dizziness and imbalance^{2,3,4}.

In this case, degenerative changes and osteophytes likely contributed to abnormal sensory input and postural instability. Restricted cervical mobility and chronic neck pain may have further impaired joint position sense and neuromuscular control, thereby exacerbating symptoms. Additionally, although not confirmed in this patient, osteophytic changes have been postulated to contribute to symptoms through possible mechanical effects on adjacent vascular structures⁴.

The patient's improvement with a multimodal rehabilitation approach supports the role of cervical proprioceptive retraining, strengthening with postural correction, and combined vestibular rehabilitation in the management of cervicogenic vertigo.



Figure 1. Plain radiograph and computed tomography (CT) images of the cervical spine demonstrating multilevel cervical spondylotic changes with prominent anterior osteophyte formation and uncovertebral osteophytes involving the mid-cervical vertebrae (predominantly C3 to C6), consistent with degenerative cervical spondylosis associated with cervicogenic vertigo

Cervical proprioceptive training, particularly using joint position sense exercises, may help restore sensorimotor integration. Strengthening of deep neck flexors and scapular stabilizers contributes to improved cervical stability and posture. Vestibular rehabilitation, including habituation and gaze stabilization exercises, complements cervical interventions by addressing associated balance and visual-vestibular deficits^{3,5}).

The use of a structured, multimodal approach is important, as isolated interventions may not adequately address the complex interplay of factors contributing to cervicogenic vertigo. These findings are consistent with previous literature suggesting that targeted rehabilitation can significantly improve symptoms in cervicogenic vertigo, although high-quality evidence remains limited^{4,5}.

Clinical Relevance to Rehabilitation Practice

Persistent vertigo not responding adequately to vestibular medications should prompt evaluation for possible cervical causes. Rehabilitation plays a central role in management, particularly through a multimodal approach combining cervical proprioceptive retraining, postural correction, strengthening exercises, and vestibular rehabilitation. Such combined interventions

are often more effective than isolated treatment strategies in addressing the complex mechanisms contributing to cervicogenic vertigo.

Conclusion

Cervicogenic vertigo is an important and often overlooked cause of dizziness. This case demonstrates that an individualized rehabilitation program focusing on cervical proprioception, strength, and vestibular adaptation can lead to significant clinical improvement. Early involvement of rehabilitation specialists is essential for optimal outcomes.

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