

## CASE REPORT

# Association of Cervical Spondylosis with Recurrence of Benign Paroxysmal Positional Vertigo: a case report

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## SUMMARY

Benign Paroxysmal Positional Vertigo is thought to be the main cause of vertigo globally. It is recurrent and remediable disease accounts under peripheral vestibular disorder which involve one or more then on semicircular canal with floating and displaced otoconia. Activated afferents of semicircular canals produce false sensation of nystagmus. It is characterized by scanty spinning sensations initiated by head movements, commonly in the vertical or horizontal planes. BPPV is common in elderly population and is often undiagnosed or misdiagnosed. BPPV is mostly diagnosed by history and complete examination which involve the Dix-Hallpike maneuver consider as gold standard maneuver in assessment. BPPV is mostly treated conservatively utilizing various physiotherapeutic techniques. Patient education, Semont maneuver (SM), Epley maneuver, Brandt Daroff along with vestibular rehabilitation exercises are proven to be effective in improving sensations of vertigo and chances of reoccurrence.

**Keywords:** Benign Paroxysmal Positional Vertigo, Cervical Spondylosis, Association

## INTRODUCTION

The most common peripheral vestibular dysfunction is benign paroxysmal positional vertigo<sup>1</sup>. Patient with BPPV commonly complain about mild attack when they move there head relative to gravity. According to global data BPPV shows incidence of 64/100,000<sup>2</sup>. Prevalence of benign paroxysmal positional vertigo of all hospital visits due to vertigo and dizziness accounts 24.1%<sup>3</sup>. Vertigo is defined as sensation of being in motion or illusionary movement of surroundings and assuming that surrounding is spinning while true motion is absent<sup>4</sup>. Changing in head position relative to gravity produce spinning sensation called positional vertigo<sup>5</sup>; so repeated episode of positional vertigo that involves inner ear is called benign paroxysmal positional vertigo. The term benign suggests that BPPV is a type of positional vertigo unrelated with a severe central nervous system illness, and that the prognosis is generally satisfactory<sup>6</sup>.

The primary etiology of benign paroxysmal positional vertigo is largely unknown, while some of the cases may be connected to a head injury, a prolonged reclining position or a number of inner ear problems<sup>3</sup>. Pathologically it is characterized as partial displacement of otoconia that cause free derbies to float in endolymph present in semicircular canals called canalolithiasis and cupulolithiasis is a adhesion of free floating particles to cupula<sup>7</sup>. Most commonly BPPV develops in posterior canal, in 5–22% and less common in horizontal canal<sup>8</sup> and rarely in anterior canal<sup>9</sup>. Other risk factors of benign paroxysmal positional vertigo may comprise of: Age, gender, hyperlipidemia, hypertension, diabetes, migraine, otitis media, osteopenia/ osteoporosis<sup>10</sup> that proceeds toward cervical spondylosis<sup>11</sup>.

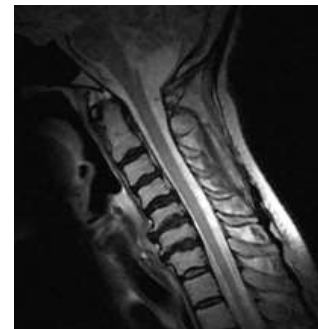
Sign and symptoms of benign paroxysmal positional vertigo may include: Nausea, unsteadiness, vomiting and sense of illusionary spinning of surrounding. These symptoms are episodic in nature and can reoccur. Symptoms appear on change in head position and patient feels out of balance when try to stand or walk. Other symptoms include abnormal rhythmic eye movements<sup>12</sup>. Benign paroxysmal positional vertigo is diagnosed on the basis of history, physical examination and characteristics of nystagmus in vestibular positional testing<sup>8,13</sup>. Posterior canal BPPV is diagnosed by Dix-Hallpike test, horizontal canal by Supine roll test<sup>5</sup> and anterior canal by Supine head-hanging test<sup>14</sup>. The short latency period, fatigue, and reversal of the nystagmus when shifting to an upright position all support the diagnosis<sup>15</sup>. Recent evidence supports Vestibular Evoked Myogenic Potential (VEMP) to diagnose the cases of BPPV<sup>16</sup>.

This vestibular dysfunction is usually treated conservatively using various physiotherapeutic techniques. Currently, repositioning manoeuvres are the most effective evidence-based method for treating BPPV. Epley maneuver, Semont maneuver (SM) and Brandt Daroff exercises are effective in treating BPPV<sup>17,18</sup>. Evidence indicated concluded that semont maneuver is more effective than epley maneuver for patients with cervical pathologies<sup>19</sup>. This study aims to find correlation between cervical spondylosis and recurrence of BPPV. It will help researcher to identify one of the most important risk factor prior onset of BPPV and will further help in building patient tailored intervention plan.

## CASE PRESENTATION

A 60-year-old Asian female who suffered from cervical spondylosis for 1 year, presented to physical therapy clinic with a primary complaint of neck pain, headache, shoulder pain and spinning sensations. Her neck pain developed over the course of 1.5 years, starting out slowly. She visited her general physician six months after her symptoms started. She was initially given a prescription for a course of non-steroidal anti-inflammatory medicines (NSAIDs), which somewhat reduced her pain. She also noticed a sudden rise in pain during her ADLs that was radiating to her right upper extremity. After three additional appointments, an MRI was recommended for her. This MRI confirmed that she had cervical spondylosis involving C4-C6 vertebrae [Fig. 1]. Her left lower extremity had undergone venous bypass surgery in the past. Previous medical illnesses included vertigo, chicken pox, pre-diabetes, hypertension, and chicken pox.

Fig. 1: A 60-year-old woman's Sagittal T2 Weighted Cervical MRI reveals marginal osteophytes affecting the C4-7 vertebrae, as well as intervening disc desiccation and abnormalities at the end plates. There is no compression of the spinal cord.



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Fig. 2: Radiographic study of cervical osteophytes and degenerative changes in a lateral view



**Clinical implications:** Based on her presenting symptoms, the author developed a strong suspicion of Vertebrobasilar insufficiency and Benign Paroxysmal positional vertigo. The probability of spinal compression as the source of insufficiency was raised by the presence of hypertension, diabetes, vertigo, and neck stiffness with persistent unilateral pain. But there were no asymmetries that could indicate subclavian stenosis or aortic compression during a physical examination of orthostatic vital signs, which include (1) palpation of bilateral radial pulses and (2) measurement of blood pressure in the upper extremities. The APA protocol for vertebral artery testing was used. The vertebral artery test, often known as a cervical extension rotation test, was carried out. With this kind of approach, nystagmus and visual disturbances were not noted.

Fig. a: 45° passive right horizontal rotation in sitting



Fig. b: Patient quickly assisted into supine with 30° of extension



Diagnostic criteria for posterior canal BPPV

History	Patient reports repeated episodes of vertigo with changes in head position
Physical Examination	Each of the following criteria are full filled:
	Vertigo associated with nystagmus is provoked by the Dix-Hallpike test.
	There is a latency period between the completion of the Dix-Hallpike test and the onset of vertigo and nystagmus.
Characteristic Of Nystagmus	The provoked nystagmus and vertigo increase and then resolve within a time period of 60 seconds from the onset of nystagmus.
	The Dix-Hallpike maneuver causes a characteristic up beating-torsional nystagmus, in which vertical component beats towards the forehead and the upper pole of the eye beats towards the dependent ear.
	After the patient's head is back in an upright position, the direction of the Nystagmus may be reversed.
	The nystagmus often fatigues (becomes less severe) when the maneuver is repeated.

A primary diagnosis of cervical spondylosis was made on the basis of an MRI. A secondary diagnosis of Benign Paroxysmal Positioning Vertigo was established on the basis of positioning-related character of spinning symptoms, the brief latency of these symptoms and the positive Dix-Hallpike test revealing a positional upbeat clockwise torsional nystagmus.

**DISCUSSION**

At the best of our knowledge, we present a case which shows a direct association of cervical spondylosis with one of the peripheral vestibular dysfunction that is BPPV, which has not been discussed in the literature yet. This case report reveals an unreported vestibular impairment in conjunction with headache and neck pain. The patient in this case report was referred for the primary complaints of cervical spondylosis and BPPV was some other medical problem that was identified based on the findings gathered during the initial evaluation. The patient came to the physiotherapy outpatient unit with diagnosed cervical spondylosis with MRI complaining of neck pain with headache and spinning sensations. Based on the clinical presentation of the symptoms and history the patient was suspected of peripheral vestibular dysfunction. We performed extensive physical examination. Initially, the detailed examination of orthostatic vital signs and vertebral artery test helped to eliminate the suspicion of vertebrobasilar insufficiency test. This increased the probability of benign paroxysmal positional vertigo. The spinning sensations of patient were confirmed to be due to BPPV by performing Dix-Hall pike test. When diagnosing BPPV, the Dix-Hallpike maneuver is thought to be the gold standard to use. When compared to a side-lying test, the validity of this test was shown to have a sensitivity of 79% and a specificity of 75 percent. The direction of nystagmus indicated the involvement of posterior canal. The nature of this spinning sensation is on and off, according to the history provided by the patient, we consider it as the recurrent episode of benign paroxysmal vertigo. The findings of our study indicate that people with cervical spondylosis may have a higher incidence of BPPV recurrence. Evidence supports that when compared to patients without cervical spondylosis, patients with cervical spondylosis have a higher risk of relapsing. Another research examined the association between repeated incidents of BPPV and the most prevalent morbidities in the geriatric population and discovered that patients with cervical osteoarthritis have a threefold increased risk of relapsing BPPV. Some evidence debates that Cervical spondylosis could encourage the recurrence of BPPV. This can be related to the concept that it is highly challenging to perform the canalith repositioning procedure (CRP) on patients with cervical spine dysfunction, which results in inadequate therapy or an early return of BPPV.

## CONCLUSION

It is concluded that Peripheral vestibular disorder must be taken into account when determining a differential diagnosis for individuals with cervicogenic headache who also suffer vertigo. Clinicians may be better able to appropriately advise patients about Benign Paroxysmal Positioning Vertigo and related comorbidities if these recurrence risk factors are identified. Although a doctor from another profession had earlier given the patient in this case study a general diagnostic of vertigo, no additional care was carried out. Physical therapists have a professional duty to assist in the diagnosis and treatment of this widespread medical disease to ensure the efficient use of healthcare resources.

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