

CASE REPORTS

CHIROPRACTIC MANAGEMENT OF A PATIENT WITH BENIGN PAROXYSMAL POSITIONAL VERTIGO: A CASE REPORT

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ABSTRACT

Objective: This article describes and discusses the case of a patient with benign paroxysmal positional vertigo (BPPV) characterized by severe vertigo with dizziness, nausea, and nystagmus, treated without the use of spinal manipulation by a doctor of chiropractic.

Clinical Features: A 46-year-old woman presented for care with complaints of acute vertigo and dizziness.

Intervention and Outcome: The patient was examined and diagnosed with left posterior canalolithiasis by means of the Dix-Hallpike maneuver. She was treated successfully with the Epley maneuver once and subsequently discharged without further treatment.

Conclusion: This case demonstrates the importance of correctly identifying patients with BPPV. This case also demonstrates the successful treatment of BPPV. (*J Manipulative Physiol Ther* 2009;32:387-390)

Key Index Terms: *Vertigo; Dizziness; Chiropractic; Nystagmus; Labyrinth diseases; Head Movement*

Benign paroxysmal positional vertigo (BPPV) is a relatively common cause of vertigo in the population with a yearly prevalence of 1.6%.¹⁻³ Most often, BPPV is thought to be caused by displaced otoconia floating in the semicircular canals (canalolithiasis); however, according to another theory, the otoconia become attached to or impinged on the cupula (cupulolithiasis).^{4,5} Whatever the mechanism, the result is a displacement of the cupula, with changes in head position, resulting in a sensation of motion and dizziness. Because of its anatomical position, the

posterior canal is most frequently involved, but the otoconia can also be located in the anterior or lateral canals and even in more than one canal at the same time. The latter typically results in an atypical nystagmus.⁴⁻⁶

The etiology behind BPPV is not known, but several factors seem to predispose a person to canalolithiasis: advanced age, head trauma, inactivity, and other ear diseases.⁷ Differential diagnoses to consider are cervicogenic vertigo, inner ear disease, central or psychogenic vertigo, medical or chemical causes of vertigo, and vestibular nerve disorders.⁸ In the case of BPPV, the patient complains of episodic dizziness in relation to changes in head position, most often when getting from a lying to an upright position. Clinical findings are a characteristic fatigable rotatory nystagmus toward the affected ear, often with a latency in onset, after performing the Dix-Hallpike maneuver^{9,10} (Fig 1A and B). During this maneuver, the patient often experiences severe vertigo and perhaps even nausea and/or vomiting.

There are several approaches to treating BPPV, including canalith repositioning maneuvers (Epley and Semont), Brandt-Daroff exercises, and surgical treatment or medication. The most frequently used is Epley maneuver, based on the canalolithiasis theory.¹¹⁻¹³ The technique involves a series of 4 movements of the head and body and is reported to be effective, easy, and safe, with few and transient side effects¹² (Fig. 1A-E). The effectiveness of the Epley maneuver compared to a placebo maneuver for posterior canal BPPV or no treatment showed a significant effect in favor of the Epley maneuver.⁵ Furthermore, there were no

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Fig 1. *A and B, Dix-Hallpike test for right canalithiasis. A to E, Epley maneuver for right canalithiasis. A, Sitting with head turned 45° to the right. B, Lying supine with head turned 45° to the right and head in 20° of extension. C, Supine with head turned 45° to the left and head in 20° of extension. D, Body turned 90°, head still in 45° of left rotation in the horizontal plane. E, Sitting with head in slight flexion neutral rotated.*

serious adverse effects of treatment.^{5,14} According to updated guidelines, the Epley and the Semont maneuvers are more effective than Brandt-Daroff exercises or no treatment, and there is recommendation against the use of vestibular suppressant medications.¹⁴ There is disagreement in the literature concerning the recommended number of repetitions during one treatment session and there appears to be 2 different opinions: either the maneuver is repeated as tolerated until nystagmus is no longer observed or no progress can be noticed, or the maneuver is performed only once.^{6,14,15} Post-maneuver instructions or recommendations such as maintaining the upright position for 24 to 48 hours or the use of neck collar are reported to be of limited value.^{16,17}

Benign paroxysmal positional vertigo is usually a self-limiting condition, although the duration of symptoms before spontaneous resolution is unclear and ranges from 2 weeks to several months.¹⁴ Still, many factors are in favor of an active treatment approach: most importantly, the reduction in time lost from work due to severe vertigo. Information regarding treatment efficacy, short-term side effects, and likelihood of recurrence should be given before attempting physical treatment.^{13,14} One should be aware that with 20% of cases, there is a concomitant ear or neurologic disease that may be masked. The purpose of this case report is to describe and discuss a case of BPPV characterized by severe vertigo with dizziness, nausea, and nystagmus, treated without the use of spinal manipulation by a doctor of chiropractic.

CASE REPORT

A 46-year-old woman, working as a chef in a catering center, reported to a private chiropractic clinic with complaints of sudden onset of severe vertigo for 2 days with no apparent etiology. The vertigo was brought on by changes in head position, especially when moving from a supine to an upright position. She also complained of neck pain and a feeling of limitation in her cervical range of motion. There were no complaints of headache, visual disturbances, or other types of neurologic symptoms. She had no history of vertigo.

The patient had not tried any other treatment for her condition nor had she tried any kind of self-care. She has been a regular patient at our clinic receiving treatments involving manipulations to the cervical spine, soft tissue therapy, and was prescribed exercises for work-related neck and shoulder pain. Her medical history was unremarkable with no major traumas, and she denied taking any prescribed or over-the-counter medication.

Objectively, she appeared in good health, with her temperature and respiration within normal limits, but her blood pressure was 148/96 and pulse was 88 beats per minute. Full neurologic examination including cranial nerve examination revealed no abnormalities. Spinal examination revealed a limitation of head movement in rotation bilaterally with lower cervical pain in the end range of movement. Moving the head in flexion and extension seemed to reproduce the dizziness. Motion palpation showed tenderness and restriction in movement in the upper cervical spine. Soft tissue palpation showed tenderness in the suboccipital and trapezoid muscles.

The Dix-Hallpike maneuver was performed as follows: with the patient seated on the examination table with the head turned 45° toward the right side, she was swiftly guided into the supine position and then the head extended around to approximately 30°. The patient response was noticed and no symptoms were provoked. The patient was returned to the seated position that precipitated an immediate heavy attack of vertigo which stopped over a short period. At this time, the test was performed once again, with the head turned 45° to the left. Very intense vertigo and nausea developed after a few seconds and a distinct rotatory nystagmus directed toward the bottom ear was noticed. The vertigo and nystagmus slowly disappeared after approximately 30 seconds.

The patient was diagnosed with left posterior canalolithiasis and, consequently, Epley maneuver was performed. The patient was once again seated on the examination table with the head turned 45° to the left. She was again swiftly guided into the supine position with the head extended 30°, and the response was as described above. After cessation of symptoms, the head was turned 45° to the right side still kept in extension, now resulting in a very light nystagmus. When

eye movements ceased, head and body were rotated 90° but maintained in the same orientation with respect to each other. This position was maintained until no nystagmus was observed. The patient was then brought to the sitting position, with the head in 20° of flexion. Immediately after the maneuver, the patient experienced extensive nausea followed by vomiting and the procedure was not repeated. No further treatment was rendered and no home exercises were prescribed. The patient was instructed to remain in the nearly upright position for the next 24 hours.

After 2 days she was able to return to work full time. Four days after the consultation, the patient had an appointment with an otorhinolaryngologist, referred by her family physician. At that time the patient experienced no gross signs of positional vertigo, with only very short periods of light dizziness when getting out of bed in the morning. The Dix-Hallpike test did not provoke any symptoms. The patient was subsequently discharged without further treatment.

DISCUSSION

Normally, vertigo in association with nystagmus and nausea provoked by rotation and extension of the cervical spine is considered a contraindication to chiropractic treatment, and many chiropractors would routinely refer such a case out of the office. We have described a case of severe vertigo that responded immediately to treatment by a chiropractor by the use of a simple repositioning maneuver. Thus, we argue that the treatment of vertigo secondary to BPPV is within the scope of practice for chiropractors provided that we manage to diagnose the different types of vertigo encountered in chiropractic care correctly. Most important, the chiropractor must be able to make the correct diagnosis before treatment of BPPV. A related but distinct diagnosis is cervicogenic vertigo that has been shown to respond favorably to spinal manipulation.¹⁸ However, an in-depth discussion of cervicogenic vertigo is outside the scope of this article and has been reviewed elsewhere.¹⁹

A good place to start when examining a patient with vertigo is to pay close attention to the patient history. In the case of BPPV, the symptoms of specific positional vertigo, nausea, and fatigable rotatory nystagmus toward the lower ear is easy to recognize and to confirm by the classic provocative tests, that is, the Dix-Hallpike.^{9,10} Paradoxically, the Dix-Hallpike maneuver, which is indicative of BPPV and thus an indication for treatment, is also considered to be one in a number of functional tests of the vertebral arteries used to identify patients at risk for developing cerebrovascular attacks.²⁰ Collectively, these tests are variations of the same theme: rotation and extension of the neck for the purpose of testing patency of the vertebral arteries. A positive test may provoke symptoms of nystagmus, vertigo, dizziness, tinnitus, visual blurring, nausea or faintness, and is considered to be an absolute contraindication to cervical manipulation by many authorities.^{21,22} This is, however, controversial; and Thiel and

Rix²³ discussed the usefulness of functional premanipulative testing, which is believed to be an indirect measure of vertebral artery hemodynamics. Based on the current literature, they stated that most of the evidence seems to strongly suggest that these screening tests lack the sensitivity that is necessary to determine the safety of cervical spinal manipulation. They questioned the benefit of provocative testing as an indicator for potential vascular sequelae with cervical SMT. Licht et al²¹ concluded that functional tests of the vertebral arteries when positive should not be seen as a general contraindication to cervical manipulation in particular if the test cannot be reproduced after 1 month or if flow in the vertebral arteries is considered normal after ultrasound examination.

There are limitations to the interpretation of the result from this single case study. In this case, the patient examination did reveal possible hypertension, which can be an indirect cause of vertigo, but we consider this an unlikely explanation because there was an immediate response to the Epley maneuver. Spontaneous remission is seen in 35% to 80% of the cases of BPPV. The high-resolution rate should be seen in the scope of differences of follow-up rates and duration of symptoms to actual diagnosis.¹⁴ One study of completely untreated patients determined a mean time interval from onset of symptoms to spontaneous resolution of BPPV of 39 ± 47 days.¹⁴

In the case represented above, the likelihood of spontaneous remission may have occurred, but we feel this is unlikely because the symptoms were only 2 days in duration and responded immediately to the Epley maneuver. Furthermore, the patient revealed a negative Dix-Hallpike test at 4 days of follow-up. We recommend a pragmatic approach with patients complaining of vertigo that is brought on by changes in head position and preexisting dizziness, positive to Dix-Hallpike maneuver and treat them with the effective and safe Epley maneuver.

CONCLUSION

Benign paroxysmal positional vertigo is a disorder of the inner ear resulting in severe dizziness and vertigo. This case has demonstrated that dizziness, correctly diagnosed as BPPV can be treated by the chiropractor without the use of spinal manipulation. Further research on this subject is necessary to interpret the extent of BPPV patients in chiropractic care, to see whether these patients are diagnosed properly and given the right treatment.

Practical Applications

- Vertigo, nystagmus, and nausea in combination are not always contraindication to chiropractic care.
- Treatment of vertigo in the form of BPPV is within the scope of practice for chiropractors.

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REFERENCES

1. Neuhauser HK. Epidemiology of vertigo. *Curr Opin Neurol* 2007;20:40-6.
2. Von Breven M, Radtke A, Lezius F, et al. Epidemiology of benign paroxysmal positional vertigo: a population based study. *J Neurol Neurosurg Psychiatry* 2007;78:710-5.
3. Mosca F, Morano M. Benign paroxysmal positional vertigo, incidence and treatment. *Ann Otolaryngol Chir Cervicofac* 2001;118:95-101.
4. Epley JM. Positional vertigo related to semicircular canalithiasis. *Otolaryngol Head Neck Surg* 1995;112:154-61.
5. Hilton M, Pinder D. The Epley (canalith repositioning) maneuver for benign paroxysmal positional vertigo (Review). *The Cochrane Library* 2007.
6. Hansen S, Karlberg M. Benign paroxysmal positional vertigo – den hyppigste form for otogen vertigo. *Ugeskr Laeger* 2007; 169:1996-2002.
7. Labuguen RH. Initial evaluation of vertigo. *Am Fam Physician* 2006 Jan 15;73:244-51.
8. Chawla N, Olshaker JS. Diagnosis and management of dizziness and vertigo. *Med Clin North Am* 2006;90:291-304.
9. Dix MR, Hallpike CS. The pathology, symptomatology and diagnosis of certain common disorders of the vestibular system. *Ann Otol Rhinol Laryngol* 1952;61:987-1016.
10. Van der Velde GM. Benign paroxysmal positional vertigo. Part I: Background and clinical presentation. *J Can Chiropr Assoc* 1999;43:31-40.
11. Epley JM. The canalith repositioning procedure: for treatment of benign paroxysmal positional vertigo. *Otolaryngol Head Neck Surg* 1992;107:399-404.
12. Yimtae K, Srirompotong S, Srirompotong S, Sae-seaw P. A randomized trial of the canalith repositioning procedure. *Laryngoscope* 2003;113:828-32.
13. Van der Velde GM. Benign paroxysmal positional vertigo. Part II: A qualitative review of non-pharmacological, conservative treatment and a case report presenting Epley's "Canalith Repositioning Procedure", a non-invasive bedside maneuver for treating BPPV. *J Can Chiropr Assoc* 1999;43:41-9.
14. Bhattacharyya N, Baugh RF, Orvidas L, et al. Clinical practice guidelines: benign paroxysmal positional vertigo. *Otolaryngol Head Neck Surg* 2008;139:47-81.
15. Nunez RA, Cass SP, Furman JM. Short- and long-term outcomes of canalith repositioning for benign paroxysmal positional vertigo. *Otolaryngol Head Neck Surg* 2000;122: 647-52.
16. Nuti D, Nati C, Passali D. Treatment of benign paroxysmal positional vertigo: no need for postmaneuver restrictions. *Otolaryngol Head Neck Surg* 2000;122:440-4.
17. Cakir BÖ, Ercan I, Cakir ZA, Turgut S. Efficacy of postural restriction in treating benign paroxysmal positional vertigo. *Arch Otolaryngol Head Neck Surg* 2006;132:501-5.
18. Bracher ESB, Almeida CIR, Almeida RR, Duprat AC, Bracher CBB. A combined approach for the treatment of cervical vertigo. *J Manipulative Physiol Ther* 2000;23:96-100.
19. Hawk C, Khorsan R, Lisi AJ, Ferrance RJ, Evans MW. Chiropractic care for non musculoskeletal conditions: a systematic review with implications for whole systems research. *J Altern Complement Med* 2007;13:491-512.
20. Magee DJ. *Orthopedic physical assessment*. 4th ed. Philadelphia: Elsevier; 2002. p. 154.
21. Licht PB, Christensen HW, Høilund-Carlsen PF. Is there a role for premanipulative testing before cervical manipulation? *J Manipulative Physiol Ther* 2000;23:175-9.
22. Childs JD, Flynn TW, Fritz JM, et al. Screening for vertebrobasilar insufficiency in patients with neck pain: manual therapy decision-making in the presence of uncertainty. *J Orthop Sports Phys Ther* 2005;35:300-6.
23. Thiel H, Rix G. Is it time to stop functional pre-manipulation testing of the cervical spine? *Man Ther* 2005;10:154-8.