Management of Benign Paroxysmal Positional Vertigo With the Canalith Repositioning Maneuver in the Emergency Department Setting

David B. Burmeister, DO
Regina Sacco, DPT, NCS
Valerie Rupp, RN, BSN

Vertigo is a common clinical manifestation in the emergency department (ED). It is important for physicians to determine if the peripheral cause of vertigo is benign paroxysmal positional vertigo (BPPV), a disorder accounting for 20% of all vertigo cases. However, the Dix-Hallpike test—the standard for BPPV diagnosis—is not common in the ED setting. If no central origin of the vertigo is determined, patients in the ED are typically treated with benzodiazepine, antihistamine, or anticholinergic agents. Studies have shown that these pharmaceutical treatment options may not be the best for patients with BPPV. The authors describe a case of a 38-year-old woman who presented to the ED with complaints of severe, sudden-onset vertigo. The patient’s BPPV was diagnosed by means of a Dix-Hallpike test and the patient was acutely treated in the ED with physical therapy using the canalith repositioning maneuver.

Report of Case

A 38-year-old woman presented to our ED with acute onset of vertigo, nausea, and vomiting, all exacerbated with head movement. The patient’s past medical history was notable for vertigo, for which she received vestibular rehabilitation. Physical examination revealed the patient to be alert and oriented to person, place, and time. Resting nystagmus was not present, and cranial nerves II through XII were intact. All other pertinent physical examination findings were normal. Dix-Hallpike testing on the right side was normal and on the left side revealed an upbeating, left torsional nystagmus lasting approximately 15 seconds (Figure 1).

Acute vertigo secondary to BPPV was diagnosed based on the examination findings. A physical therapist was contacted to evaluate the patient. Examination revealed normal balance and no gross gait deviations. The physical therapist repeated the Dix-Hallpike test, the findings of which were consistent with those of the first test conducted by the emergency physician. After the Dix-Hallpike test, the patient rated both her dizziness and nausea as 10 out of 10 on a visual analog scale. The physical therapist treated the patient with a canalith repositioning maneuver for the left, posterior, semicircular canal (Figure 2). After completion of the treatment, the patient rated her dizziness as 1 out of 10 and her nausea as 2 out of 10 on the visual analog scale.

Visual analog ratings were repeated 15 and 30 minutes after treatment. Fifteen minutes after treatment, the patient rated her dizziness as 2 out of 10 and her nausea as 3 out of 10. Thirty minutes after treatment, she rated her dizziness as 1 out of 10; her nausea rating remained the same. Thirty minutes after treatment, the patient felt well enough to go home. Before discharge, the physician repeated the Dix-Hallpike test, the results of which were normal for both right and left sides. No medications were given to the patient while she was in the ED. At discharge, the patient received a prescription for meclizine hydrochloride (25 mg [administered orally] every 8 hours) for treatment of her breakthrough vertigo and received a referral for outpatient vestibular rehabilitation.
A follow-up phone call was placed to the patient 30 days after discharge. The patient had sought follow-up treatment with an ear, nose, and throat physician but had received no additional treatment because her symptoms resolved. The patient rated her satisfaction of care in the ED 10 out of 10 on a Likert scale, with 1 meaning not satisfied and 10 meaning very satisfied. This patient’s overall length of stay in the ED was 180 minutes. The time from the examination by the physician to the patient’s discharge was 133 minutes. Average length of stay for patients treated in our ED with a diagnosis of BPPV is 260 minutes.

**Comment**

The theory of BPPV centers around canalithiasis, in which...
otoconia break free into the semicircular canals of the inner ear. Approximately 89% to 95% of BPPV cases involve the posterior canal because of its orientation to gravity. The Dix-Hallpike test is the standard for the diagnosis of BPPV; it is nearly 100% specific to BPPV and has a sensitivity of 88%. However, the Dix-Hallpike test is not frequently used in the ED setting, where vertigo is a common clinical presentation. In our experience, patients with BPPV who present to the ED are often treated with medication only. If the patient's symptoms improve enough with medication in the ED, the patient is usually sent home and the etiology of the vertigo is rarely determined prior to discharge. If this type of treatment does not resolve the patient's symptoms, the patient may need to be admitted to the hospital. Patients are sometimes evaluated by a physical therapist 1 to 2 days after hospital admission, at which point the Dix-Hallpike test is performed.

Roughly 90% of patients in whom BPPV is diagnosed can be appropriately treated with the canalith repositioning maneuver (Figure 2). The canalith repositioning maneuver is similar to the Epley maneuver but without the use of a maskoid oscillator. It is a safe and effective treatment for patients that can be performed by a clinician or a physical therapist in the ED setting.

Conclusion
In the present case, we were able to decrease time from presentation to symptom resolution, as well as eliminate the root cause of the vertigo, by using the Dix-Hallpike test to diagnose BPPV and the canalith repositioning maneuver to treat BPPV in the ED setting. The high level of diagnostic accuracy of the Dix-Hallpike test provides emergency physicians with a simple tool to diagnose BPPV. The canalith repositioning maneuver provides a conservative alternative to medication therapy. For patients with BPPV, early diagnosis and treatment could result in decreased levels of anxiety, decreased number of panic disorders, and less severe depression—all of which have been associated with vertigo—as well as decreased length of stay, number of admissions into the hospital, and costs associated with medical testing and loss of wages.

References