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Striking the Right Balance: Horizontal Canal Benign Paroxysmal Positional Vertigo: Diagnostic Challenges and the Kurtzer-Hybrid Maneuver

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Nichole Sorensen, Au.D., RAUD, Doctor of Audiology
Bailey Sinclair, M.Sc, RAUD, Registered Audiologist

In this edition of "Striking the Right Balance," Nichole Sorensen, Au.D., RAUD, and Bailey Sinclair, M.Sc., RAUD, write about horizontal canal benign paroxysmal positional vertigo (hc-BPPV) diagnostic challenges and use of the Kurtzer-Hybrid maneuver.

Michael Vekasi, AuD, R.Aud, Aud(C), FAAA coordinates the "Striking the Right Balance," feature which will cover the latest information on 'all things vestibular.' If you would like to be more involved in all things vestibular, please check out and like our Facebook page by searching for "CAA National Vestibular Special Interest Group" within Facebook. You can also reach us by email at CAAvestibular@gmail.com.

Introduction

Horizontal canal benign paroxysmal positional vertigo (HC-BPPV) is the second most common subtype of BPPV, accounting for 5–30% of cases (Parnes, Agrawal & Atlas, 2003). Unlike posterior canal BPPV, which typically presents with a characteristic pattern and an easily identifiable ear, HC-BPPV poses more diagnostic and therapeutic challenges. Identification of the nystagmus type (which will be discussed further in the paper) and the affected ear is often time-consuming and complicated. A significant indicator of HC-BPPV is that nystagmus must be present on both sides. Therefore, it can become tricky to identify the affected ear if the nystagmus and perceived dizziness are essentially symmetrical in both side-lying positions, or when an underlying condition alters the anticipated findings.

Current canalith repositioning maneuvers for HC-BPPV can be highly stimulating for patients and may require symptom-provoking repetition if the affected side is unclear. To address these limitations, the Kurtzer-Hybrid Maneuver (KHM) has been adopted in our clinical practice for its efficiency and patient tolerability. The KHM is a well-tolerated, effective intervention for both canalithiasis and cupulolithiasis, is not ear-specific, and requires fewer than 4 positional changes. This paper reviews diagnostic considerations for HC-BPPV and describes the procedural and clinical advantages and disadvantages of the KHM.

Diagnostic Considerations

Mechanical versus Non-Mechanical Nystagmus

Evaluation of the lateral semi-circular canals involves lying the patient supine with a forward head flexion of 30 degrees and rolling the head or body 90 degrees to the left and right. The first step in the diagnostic process is to determine whether the horizontal nystagmus identified during positional testing is mechanical, meaning it is mediated by otoconia debris. In HC-BPPV, nystagmus is expected in both left- and right-sided body positions. Non-mechanical nystagmus maintains a consistent pattern, regardless of the patient's positioning. This can indicate an underlying vestibular asymmetry. In contrast, mechanical nystagmus will reverse direction with side-to-side rolling because the debris is causing an excitatory response of the cupula on one side and an inhibitory response on the opposite side.

But be aware! To further complicate the diagnostic picture, these patterns of nystagmus reversal with positional changes, which are expected for mechanical HC-BPPV, can also be consistent with central vestibular pathology, such as vestibular migraine.

Canalithiasis versus Cupulolithiasis

There are two types of HC-BPPV: canalithiasis and cupulolithiasis. With canalithiasis, the otoconia are free-floating within the horizontal canal. This results in geotropic nystagmus (beating toward the ground/the undermost ear), typically with a latency of a few seconds, lasting up to approximately 40 seconds, and resolving within 60 seconds in the side-lying position. With cupulolithiasis, otoconia are understood to be adhered to the cupula. This generates an immediate, persistent ageotropic nystagmus (beating away from the ground/undermost ear), that typically lasts more than one minute in the side-lying position. In most cases of HC-BPPV, the patient is subjectively dizzy in these provoking positions, with dizziness perceived as stronger on one side.

Identification of the Affected Ear

Bow-and-lean testing is useful for determining the affected ear and confirming whether nystagmus is mechanical. To complete the Bow-and-lean, the patient sits upright, bows their head forward for 30-60 seconds, and then leans backwards for the same duration. Mechanical nystagmus will reverse direction between the two positions. In canalithiasis, bowing produces nystagmus beating toward the affected ear, while leaning produces nystagmus beating away from it. The opposite pattern occurs in cupulolithiasis.

Symptom intensity provides further diagnostic information, as canalithiasis generally induces stronger symptoms and more pronounced nystagmus on the affected side, whereas cupulolithiasis produces weaker symptoms and less pronounced nystagmus on the affected side.

Common Treatment Maneuvers for HC-BPPV

Several repositioning maneuvers are used to treat HC-BPPV, such as the Gufoni, Li, BBQ Roll, Appiani, Casani, Zuma, and Square Wave techniques. Most maneuvers require knowledge of the affected ear and whether it is canalithiasis or cupulolithiasis, as this information guides both the starting position and maneuver selection.

Some maneuvers can be performed without prior identification of the affected ear. However, these

typically involve repetition and rapid, challenging movements, which may induce significant dizziness and patient discomfort.

The Kurtzer-Hybrid Maneuver (KHM)

Procedure

The KHM combines elements of the Appiani, Casani, and Gufoni maneuvers to treat all variants of HC-BPPV in no more than four positions. The maneuver can begin on either the side with stronger symptoms or the side with weaker symptoms, though starting on the weaker-symptom side is preferred to reduce discomfort. The sequence involves lying on one side with the nose elevated 30 degrees, rotating the head 30 degrees downward, rolling to the opposite side with the nose again elevated 30 degrees, and finally rotating the head 30 degrees downward. Each position is held for one minute *after* thenystagmus subsides. The procedure concludes by returning the head to neutral to confirm resolution of symptoms (Gans, Kurtzer and McLeod, 2017).

Advantages and Limitations

The KHM offers several clinical advantages. Only one body-position change is required, which is beneficial for patients with orthopedic or mobility limitations. Rapid or highly stimulating transitions are avoided, improving patient comfort and tolerance. Additionally, the maneuver does not require identification of the affected ear, saving time and reducing unnecessary provoking positions. A noted limitation is the requirement to maintain the neck at a 30-degree angle, which may be challenging for patients with cervical restrictions, although the clinician supports the neck.

Conclusion

HC-BPPV presents unique diagnostic and therapeutic challenges due to variability in nystagmus patterns, bilateral involvement, and potential confounding conditions. Accurate differentiation between canalithiasis and cupulolithiasis, identification of the affected ear, and consideration of mechanical versus non-mechanical nystagmus are essential for effective management. The Kurtzer-Hybrid Maneuver offers an efficient, well-tolerated treatment option that addresses the limitations of traditional horizontal canal repositioning techniques.

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