

Images in Neurology

Tumarkin Drop Attack Recorded by Video Surveillance

Zichen Chen, MD; Yuzhong Zhang, MD; Qing Zhang, MD, PhD

A 47-year-old man received a diagnosis of Meniere disease (MD) because of recurrent vertigo, fluctuating hearing loss, and tinnitus in his left ear for more than 7 years.¹ The patient's frequent vertigo attacks had caused more than 10 Tumarkin drop attacks, which frightened him. However, he did not develop any other neurological disease, such as epilepsy or ataxia.

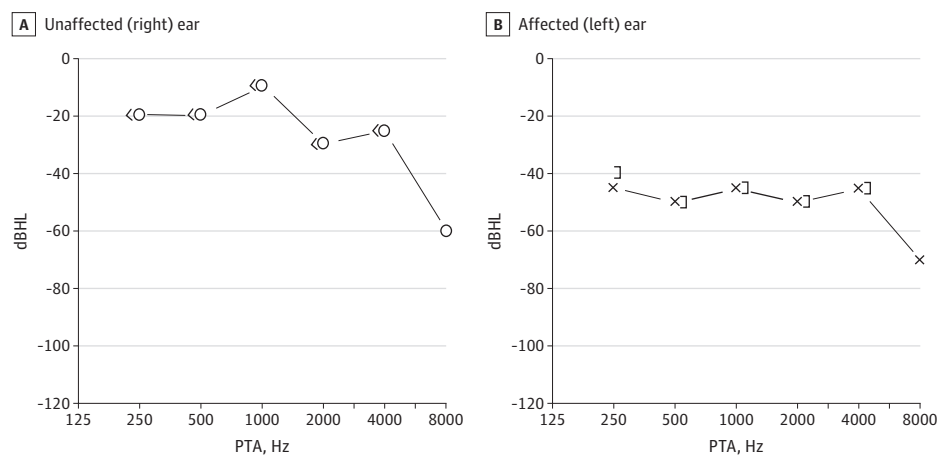
One of the patient's typical drop attacks occurred while he was standing inside the business he owns and happened to be recorded by video surveillance (Video). He did not lose consciousness and vomited throughout the episode. He did not have nausea or foaming at the mouth. Each attack was less than 1 minute in duration. He was able to stand on his own after falling. This sort of drop attack occurred 1 or 2 additional times during the week.

Testing results revealed that the patient had sensorineural hearing loss (Figure 1) and an elevated electrocochleography ratio (0.56 of summing potential/action potential) in his left ear. His cervical

vestibular evoked myogenic potential (VEMP) was absent, whereas his ocular VEMP was elicited in the affected ear (Figure 2). Both VEMPs were intact in the contralateral ear. Caloric testing results revealed a canal paralysis value of 9% (within normal limits). Over the course of 6 months, several rounds of conventional medication, including a dehydrating agent, betahistine, and an intratympanic dexamethasone injection were administered. After this treatment approach was unsuccessful, endolymphatic sac decompression surgery was performed. The patient has not experienced any subsequent episode of vertigo or drop attack since then (level A) and his hearing in the affected ear was preserved throughout the 3-year follow-up period.

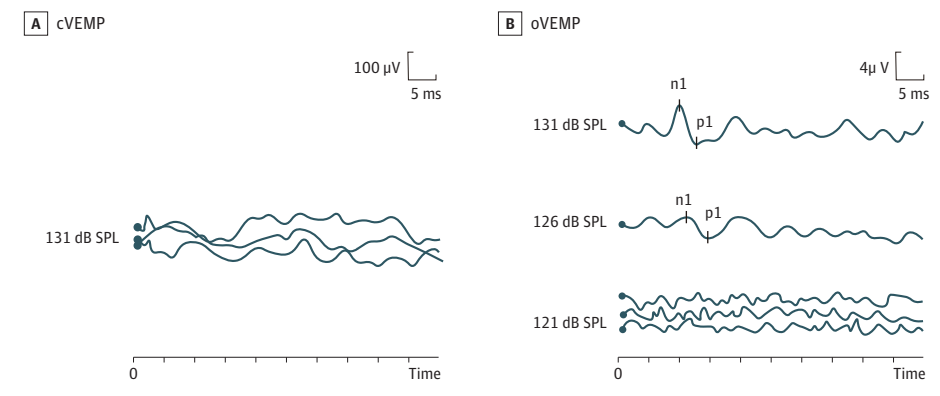
Tumarkin drop attacks are frightening. Sudden falls without warning can lead to serious injuries or fractures, especially among

Figure 1. Audiometry Results of This Patient With Meniere Disease



The patient's pure tone average (PTA) on audiometry was 20 dB HL in the unaffected ear and 48 dB HL in the affected ear.

Figure 2. Cervical Vestibular Evoked Myogenic Potential (VEMP) (cVEMP) and Ocular VEMP (oVEMP) Responses in the Affected Ear of This Patient With Meniere Disease



The cVEMP response was absent, but oVEMP was elicited in the affected (left) ear. The cVEMP and oVEMP responses were present in the contralateral unaffected ear (not shown).

elderly individuals. This type of sudden fall (ie, otolithic crisis, Tumarkin drop attack, or drop vestibular attack) comes without warning or loss of consciousness or any neurologic symptoms. The condition affects a small proportion of patients with MD. Tumarkin drop attack was first described as an otolithic catastrophe by Tumarkin in 1936.² The patients typically describe a sensation of being pushed, thrown, or knocked to the ground or a sudden illusion of environmental tilt that causes a fall.³ The pathophysiology of Tumarkin drop

attack is thought to be associated with sudden changes of the utricle or saccule function or by sudden stimulation in the form of mechanical deformation. Mechanical deformation may be caused by pressure differentials within the inner ear or a rapid change in electrolyte levels in the endolymph and perilymph, which results from biochemical mixing subsequent to rupture of the membranous labyrinth.⁴ We want to share this information with more physicians to draw attention to this manifestation of Meniere disease.

ARTICLE INFORMATION

Author Affiliations: Department of Otorhinolaryngology-Head and Neck Surgery, Second Affiliated Hospital of Xi'an Jiaotong University School of Medicine, Shannxi Province, China (Chen, Y. Zhang, Q. Zhang); Department of Otorhinolaryngology-Head and Neck Surgery, Xinhua Hospital, Shanghai Jiaotong University School of Medicine, Shanghai, China (Y. Zhang, Q. Zhang).

Corresponding Author: Qing Zhang, MD, PhD, Department of Otorhinolaryngology, Head and Neck Surgery, Second Affiliated Hospital of Xi'an, Jiaotong University School of Medicine, 157 Xiwu Rd, Xi'an, Shannxi Province, China; Department of Otorhinolaryngology, Head and Neck Surgery, Xinhua Hospital of Shanghai, Jiaotong University

School of Medicine, 1665 Kongjiang Rd, Shanghai, China 200092 (zhqent@163.com).

Published Online: May 4, 2020.
doi:[10.1001/jamaneurol.2020.0884](https://doi.org/10.1001/jamaneurol.2020.0884)

Conflict of Interest Disclosures: Dr Q. Zhang reported support from the National Natural Science Foundation of China (grants 81670945 and 81970891) during the conduct of the study. No other disclosures were reported.

Additional Contributions: We thank the patient for granting permission to publish this information.

REFERENCES

1. Lopez-Escamez JA, Carey J, Chung WH, et al; Classification Committee of the Barany Society; Japan Society for Equilibrium Research; European Academy of Otolology and Neurotology (EAONO); Equilibrium Committee of the American Academy

of Otolaryngology-Head and Neck Surgery (AAO-HNS); Korean Balance Society. Diagnostic criteria for Meniere's disease. *J Vestib Res.* 2015;25(1):1-7. doi:[10.3233/VES-150549](https://doi.org/10.3233/VES-150549)

2. Tumarkin A. The otolithic catastrophe: a new syndrome. *Br Med J.* 1936;2(3942):175-177. doi:[10.1136/bmj.2.3942.175](https://doi.org/10.1136/bmj.2.3942.175)

3. Ishiyama G, Ishiyama A, Baloh RW. Drop attacks and vertigo secondary to a non-Meniere otologic cause. *Arch Neurol.* 2003;60(1):71-75. doi:[10.1001/archneur.60.1.71](https://doi.org/10.1001/archneur.60.1.71)

4. Black FO, Effron MZ, Burns DS. Diagnosis and management of drop attacks of vestibular origin: Tumarkin's otolithic crisis. *Otolaryngol Head Neck Surg.* 1982;90(2):256-262. doi:[10.1177/019459988209000221](https://doi.org/10.1177/019459988209000221)