



### Canalith-Repositioning Maneuvers and Balance Interventions on a Patient with Multiple-Canal BPPV: A Case Study

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#### BACKGROUND & PURPOSE

The Epley maneuver is a common intervention used to treat benign paroxysmal positional vertigo (BPPV).<sup>1</sup> The onset of BPPV can occur following mild head trauma due to lesions in the utricle or saccule macula and multiple canals may be affected in some cases.<sup>1,2</sup> BPPV can adversely affect balance secondary to disturbances in vestibular system functioning.<sup>3</sup>

The purpose of this case report is to demonstrate using canalith-repositioning maneuvers and balance training as interventions to reduce vertigo and improve balance and gait in a patient with multiple-canal BPPV.

#### CASE DESCRIPTION

88-year-old female who suffered a fall, hitting her head and subsequently developed vertigo

##### Impairments:

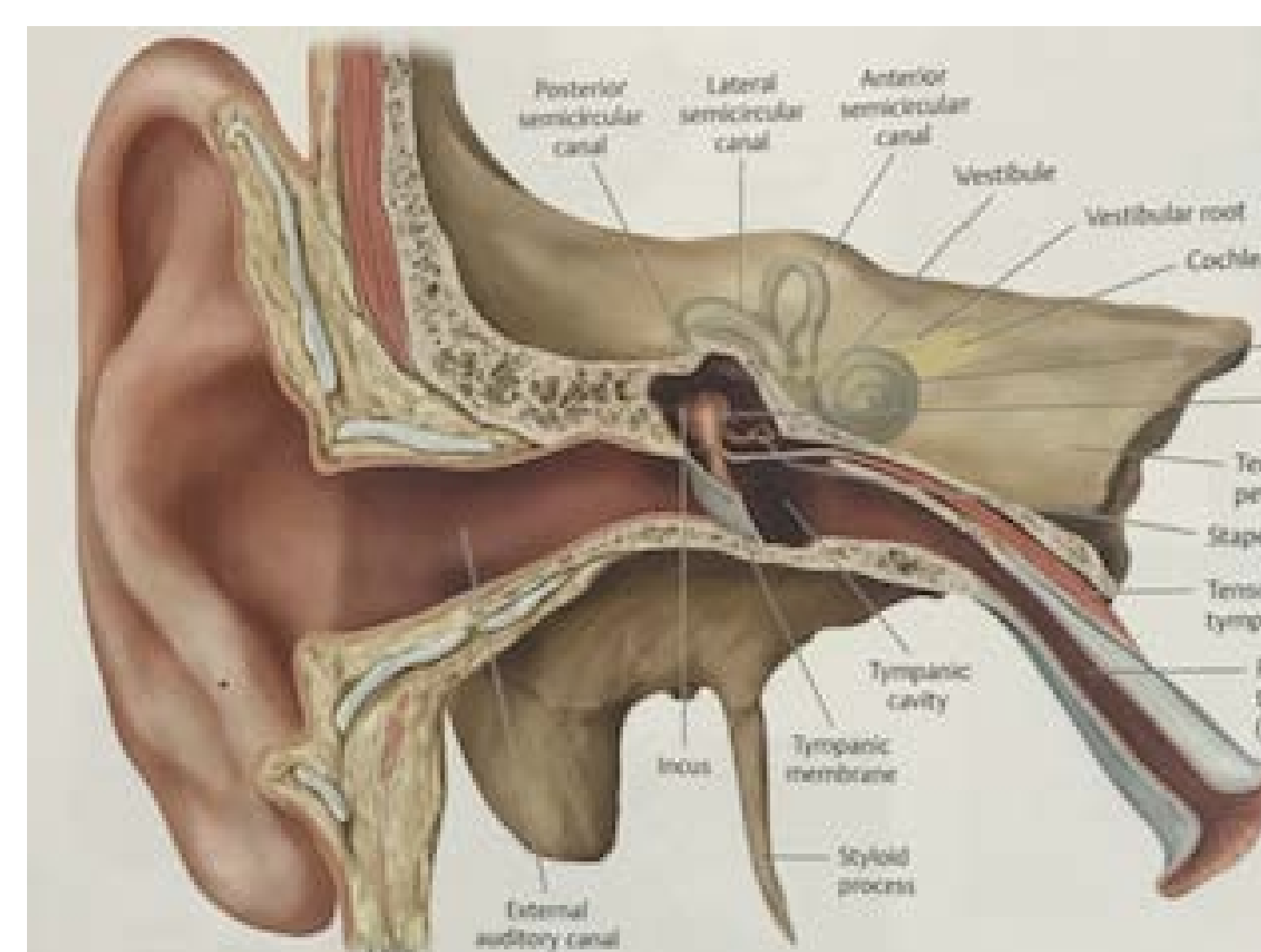
- Severe Dizziness with positional changes, bed mobility and ambulation
- LE Weakness
- Hallpike-Dix: + downbeating torsional nystagmus

##### Activity Limitations:

- Impaired Balance
- Difficulty Ambulating

##### Participation Restrictions:

- Grocery shopping
- Community events



#### INTERVENTIONS

Visit	Hall-Pike Dix	Intervention
Visit 1	(+) AC Canalithiasis	L Epley Maneuver 1x
Visits 2-3	(+) AC Canalithiasis	L Epley Maneuver 1x Single Leg Stance (SLS)/taps Walking with Head Turns Tandem Stance
Visit 4	(+) AC Canalithiasis	L Epley Maneuver 3x Walking with head turns Obstacle negotiation
Visit 5	(+) AC Canalithiasis HC Canalithiasis	L Epley Maneuver 1x L BBQ Roll 2x
Visit 6	(+) PC Canalithiasis (-) On 2nd and 3rd assessment	L Epley Maneuver x3 SLS Tandem stance Tandem walking
Visit 7	(+) PC Canalithiasis (+) HC Canalithiasis	L Epley Maneuver x1 BBQ x1 BBQ x1
Visits 8-10	(+) PC Canalithiasis (-) On final assessment	L Epley Maneuver 3x,1x,1x Walking with head turns Tandem stance SLS cone taps Tandem walking/obstacle negotiation

#### OUTCOMES

At discharge, post-intervention assessments revealed her Dizziness Handicap Inventory Scale (DHIS) improved from a score of 80 points (severe handicap) to 50 points (moderate handicap). The Berg Balance Scale improved from 27/56 points to 30/56 points (medium fall risk) and the Timed Up-and-Go test improved from 29 seconds to 24 seconds. The Dynamic Gait Index (DGI) score improved from 6/24 points to 10/24 points.

#### DISCUSSION

Overall, after treatment with the Epley maneuver and balance activities, the patient demonstrated improvement in the DHIS as evidenced by the patient's ability to perform functional tasks and mobility with less dizziness. Following the intervention, the DHIS and DGI met the minimal detectable change (MDC) and the minimally clinically important difference (MCID). The outcomes of this case report demonstrate that the Epley maneuver with vestibular rehabilitation may have contributed to improvement in dizziness and balance in a patient with multiple-canal BPPV following minor head trauma.

#### REFERENCES

1. Suarez H, Alonso R, Arocena M, Suarez A, Geisinger D. Clinical characteristics of positional vertigo after mild head trauma. *Acta Oto-Laryngologica*. 2011; 131(4): 377-381. doi: 10.3109/00016489.2010.534113.
2. Tomaz A, Gananca M, Gananca C, Gananca F, Caovilla H, Harker L. Benign paroxysmal positional vertigo: concomitant involvement of different semicircular canals. *Ann Otol Rhinol Laryngol*. 2009; 118(2):113-117.
3. Ribeiro K, Freitas R, Ferreira L, Deshpande N, Guerra R. Effects of balance vestibular rehabilitation therapy in elderly with benign paroxysmal positional vertigo: a randomized controlled trial. *Disabil Rehabil*. 2017; 39(12):1198-1206. doi:http://dx.doi.org/10.1080/09638288.2016.1190870.
4. Schunke M, Schulte E, Schumacher U. *Thieme atlas of anatomy*. 2<sup>nd</sup> ed. New York (NY): Thieme; 2015:558.