

# Rapid postural improvement in mixed diagnosis of recurrent vestibulopathy and posterior BPPV: A Case Study

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## ARTICLE INFO

### *Article history:*

Received  
21 September 2023  
Revised in revised form  
1 April 2024  
Accepted  
1 August 2025  
Published  
1 March 2026

### *Keywords:*

VRT, BPPV, Vestibulopathy,  
Bal Ex

### *DOI:*

10.24191/jchs.v11i1.10837

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## ABSTRACT

Benign paroxysmal positional vertigo (BPPV) is a condition caused by otoconia that cause spinning. Recurrent vestibulopathy is characterized by several episodes of vertigo lasting minutes to hours, which last longer than six months and are devoid of neurological or auditory symptoms. The triggering factors for mixed BPPV and recurrent vestibulopathy include head trauma, inner ear disease, and prolonged immobilization following cerebrovascular infarction. In this case, we evaluated the improvement of recurrent vestibulopathy and posterior BPPV case using BPPV manoeuvre and Intensive Balance Rehabilitation specifically looking at postural control. A 51-year-old female patient, with a history of asthma, allergic rhinitis, migraine, and vertigo for three years was diagnosed to have recurrent chronic vestibulopathy. Vestibular Rehabilitation using the Bal Ex exercise was applied to promote adaptation to and substitution for various aspects of deficits related to a wide variety of balance disorders.

## 1. INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is an inner ear disorder that is characterized by short episodes of rotational vertigo that happen suddenly due to changes in head positions like lying down or turning in bed, leading to sudden vertigo – a feeling that the room is spinning. BPPV occurs when the canalith particles (otoconia) break loose and fall into the wrong part of the semicircular canals of the inner ear. The otoconia displacements induce a short duration of intense spinning vertigo especially when the patients lie down, turn the head to the side, or rise from a prone position. BPPV may involve multiple semicircular canals, such as the anterior and posterior canals.

The mixed-canal type of BPPV frequently involves canals on the same side. Trauma may increase the risk of mixed-canal BPPV. The triggering factors for the risk of BPPV include head trauma, inner ear disease prolonged immobilization following cerebrovascular infarction, and others.

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Acute unilateral vestibulopathy is characterized by a spinning sensation of acute onset that lasts for at least 24 hours, accompanied by oscillopsia, a tendency to fall, and nausea. 3 Recurrent vestibulopathy is an illness with no known origin that causes recurrent episodes of vertigo that last anywhere from five minutes to twenty-four hours and are accompanied by no neurological or auditory symptoms.

In cases of BPPV and recurrent vestibulopathy, accurate treatment is important since it can jeopardize the patient's quality of life. Recently, new evidence suggested that a specific manoeuvre based on the Bal Ex module offers curative therapy in the majority of BPPV cases applied in our setting. The Bal Ex module is one of the balance exercise therapies, developed with the combination of customized Cawthorne Cooksey Exercise and Muslim prayer movement, currently used in our hospital (Hospital USM, Malaysia) to treat vestibular disorders cases.<sup>6</sup> Vestibular Rehabilitation Therapy (VRT) is a specific form of physical therapy designed to promote adaptation and substitution for various aspects of deficits related to a wide variety of balance disorders. Exercise in the Bal Ex module that includes head and neck movements are essential in stimulating and retraining the vestibular system. The Bal Ex module consists of twenty movements divided into three levels. This physical exercise module has many advantages for many cases of balance problem cases such as BPPV and recurrent vestibulopathy (Fig. 1)



Fig. 1 Home-based Bal Ex (balance exercise) module

Source: Muhammad Munzir Zuber Ahmadi et al (2026)

Table 1 Movements in the Bal Ex (balance exercise) Module

Level 1	Level 2	Level 3
Movement of head in all directions with/without closed eyes	Movement of body like movement in prayer, up and down	Movement while walking in one place and in direction
Movement of head in all directions with the eyes focused at center		Increase the postural control
		Return to normal walk, running and use a stair

Source: Muhammad Munzir Zuber Ahmadi et al (2026)

## 2. CASE PRESENTATION

A female patient, age 51, who has been receiving treatment for over two years for underlying asthma, allergic rhinitis, and migraine, has been suffering from vertigo and dizziness for three years, which have gotten worse when she moves her head. She also complained of sudden attacks of vomiting, a floating sensation, and nausea during the episode. The most severe attack was four months ago with positional vertigo which was described as a spinning sensation when waking up from sleep, which was then partially resolved after treatment by the otorhinolaryngology team. During severe attacks, mild anxiety was reported intermittently. She has previously experienced similar symptoms for the past 2 weeks but is now improving well. The majority of attacks occur with a severe headache followed by vertigo and dizziness. On examination, the patient is conscious and alert. A neurological examination was done and the result was normal. The patient was evaluated using three questionnaires administered before and after treatment. There are Malay version of the Vertigo Symptom Scale (MVVSS), Beck Depression Inventory (BDI), and Beck Anxiety Inventory (BAI). (Table 2). She was diagnosed with posterior left BPPV.

**Table 2.** Subjective measures Pre and Post treatment

Component	Pre session	Post 3 sessions
Malay Version of vertigo symptom scale (MVVSS)	moderate	moderate
Beck Depression Inventory (BDI)	mild	mild
Beck Anxiety Inventory (BAI)	mild	mild

Indicator:

- i. Malay Version of vertigo symptom scale (MVVSS) - range: Mild:10-19 1 (1.5). Moderate 20-29 9 (13.8). Severe: 30-39 8
- ii. Beck Depression Inventory (BDI) - Range of severity: 0-10 point is not depressed, 11-17point is Mild to moderately depressed and 18-63 point is depression
- iii. Beck Anxiety Inventory (BAI), range, 8-15 is mild, 16-5 is moderate, and 26-63 is severe.

To evaluate postural control pre-and post-therapy for patients with a mixed diagnosis of BPPV and recurrent vestibulopathy we apply the Bal Ex therapy module, and the use of special foam called the Bal Ex Foam Test (Figure 2). This Bal Ex Foam Test is adapted from the Bal Ex module. Bal Ex Foam Test has a structured scoring foam that is divided into seven sections. (Table 3) All the findings is shown in Table 2. A positive Fukuda test has been identified (Table 3). Interpretation of the Bal Ex Foam Test is considered normal if the score is more than 10 seconds in every step.



Fig. 2 Bal Ex Foam

**Table 3.** Bal Ex Foam Test structured scoring components

Level	Description	Pre therapy	Post balance rehabilitation therapy
1	Stand on the floor with arms across your chest and feet together and hold for 30 seconds (eyes open)	Normal	Normal
2	Stand on the floor with arms across your chest and feet together and hold for 30 seconds (eyes closed)	< 3 seconds	< 7 seconds
3	Stand on the floor with arms across your chest, toe touching the other side of heel and hold for 30 seconds (eye open)	Normal	Normal
4	Stand on the floor with arms across your chest, toe touching the other side of heel and hold for 30 seconds (eyes closed)	< 2 seconds	< 6 seconds
5	Stand on a 3-inch-high density foam cushion with your arms crossed, feet together and hold for 30 seconds (eyes opened)	Normal	Normal
6	Stand on a 3-inch-high density foam cushion with your arms crossed, feet together and hold for 30 seconds (eyes closed)	< 3 seconds	< 5 seconds
7	Fukuda test	Abnormal (Deviated to left side about 60 degree)	Abnormal (Deviated to left side about 70 degree)

Source: Muhammad Munzir Zuber Ahmadi et al (2026)

### 3. DISCUSSION

The symptoms associated with a mixed diagnosis of BPPV and recurrent vestibulopathy include head motion-induced vertigo, such as non-spinning vertigo, positional vertigo, and orthostatic vertigo. Attacks are generally mild and may be accompanied by palpitations. In this case, the patient reported sudden episodes of dizziness associated with nausea, vomiting, and a floating sensation. Previous studies have shown that episodic vertigo may be related to migraine, while other possible causes include recurrent vestibular neuritis.

Following the intervention, a rapid and marked improvement in postural control was observed after the application of the Gans Canal Repositioning Manoeuvre and intensive balance rehabilitation using BalEx-VRT (Bal Ex Quick Balance Therapy) (Table 3) with the use of Bal Ex foam (Figure 2). The Gans Canal Repositioning Manoeuvre is an effective intervention for resolving BPPV. The patient reported approximately 60% improvement in vertigo and imbalance symptoms after three BalEx-VRT sessions using Bal Ex foam, completed within a single day.

This improvement was considered rapid, as noticeable effects were experienced within one day of balance therapy and by the second day following the Gans manoeuvre. However, subjective outcome measures, including MVVSS, BDI, and BAI, showed minimal change after three therapy sessions, indicating no significant difference in vertigo severity, anxiety, or depression levels.

### 4. CONCLUSION

In conclusion, managing a mixed diagnosis of Benign Paroxysmal Positional Vertigo (BPPV) and recurrent vestibulopathy presents a complex challenge that demands careful attention to effectively alleviate symptoms and enhance patients' quality of life. Further, research is necessary to yield more significant results, as a larger sample size would provide deeper insights into the optimal management strategies for such cases. By continuing to investigate and refine treatment approaches, healthcare professionals can better address the needs of individuals grappling with these intertwined vestibular disorders, ultimately improving outcomes and patient well-being.

### 5. CONFLICT OF INTEREST

Author declares none.

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