

Vertigo And Dizziness Related Disorders: Clinical Spectrum and Management in A Clinic Based Otolaryngology Practice in an Urban Centre

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Abstract

* Background: Vertigo / dizziness is a common problem encountered in clinical practice. It is described in different ways by each patient. Hence, it becomes difficult for the clinician to interpret and manage dizziness suffered by the patients. * Objective: To study demographics, types of vertigo / dizziness, its impact on the quality of life and management in a UAE otolaryngology clinic * Method: This is a retrospective, observational, descriptive study of patients presenting with dizziness in our medical facility, between September 2019 to March 2022. * Result: In the present study, 58.61% of the patients were male. Average age of the study population was 42.69 years. Vertigo/spinning type of dizziness was the most reported symptom. Most reported associated symptom was nausea, and the trigger was 'head movement'. 56.30% of the study population was diagnosed with benign paroxysmal positional vertigo (BPPV). Most used diagnostic tool was Dix-Hallpike maneuver, and the management method was particle repositioning maneuver. The average baseline Dizziness Handicap Inventory (DHI) score was 19.37 ($\pm$ 13.46), which reduced to 9.22 ($\pm$ 10.94) three weeks after treatment (p value <0.0001). * Conclusion: Vertigo / dizziness related to peripheral causes accounts for a significant proportion of cases in routine otolaryngology practice. From our study we can easily conclude that vertigo / dizziness related disorders negatively affect QOL. Proper diagnosis and management would help to improve the symptoms and QOL. Simple office-based, patient-oriented detail history taking, and clinical examination is important in the diagnosis and management of the dizziness. History taking or questions should focus on the type of dizziness, associated features, duration, and triggers which would help in pinpointing differential diagnosis and the management. Red flags like focal neurological signs should be taken seriously and investigated further. Keywords: Dizziness, vertigo, Dix-Hallpike maneuver, particle repositioning maneuver, DHI

Introduction:

The term "dizziness" refers to an unpleasant disturbance of spatial orientation while vertigo refers to an erroneous perception of movement which involves movement either of one's own body, such as swaying or rotation, or of the environment, or both. Vertigo and dizziness are one of the common symptoms presented to physicians. Their lifetime prevalence is approximately 20% to 30% [14, 20]. Its prevalence rises with age and is about two to three times higher in women than in men [14]. It is usually benign and self-limiting. Vertigo / dizziness is associated with many causes- hypotension, dehydration, Meniere's disease; to more serious brain tumor, stroke, myocardial infarction, etc.

International Classification of Vestibular Disorders I (ICVD-I) by the Committee for the Classification of Vestibular Disorders of the Barany Society classified vertigo and dizziness based on the description as (i) Vertigo (ii) Dizziness (iii) Vestibulo-visual symptoms (iv) Postural symptoms [2]. Because vertigo and dizziness are often triggered symptoms and many vestibular disorders are identified by the presence (or absence) of particular triggers; it further classified vertigo and dizziness as 'Triggered' and 'Spontaneous' [2].

Targeted history taking, clinical bedside examinations, functional testing of the vestibular system, and imaging are instrumental for correct diagnosis and therapy management [24]. Wuyts, Floris L et al developed a ‘SO STONED’ questionnaire tool for dizziness/vertigo assessment and differential diagnosis; based on their experience and literature [24]. It encompasses set of eight independent but closely related dimensions necessary to discriminate between several diagnoses. The acronym ‘SO STONED’ stands for, S: symptoms, O: often, S: since, T: trigger, O: otology, N: neurology, E: evolution, D: duration. Trigger is an important aspect for differential diagnosis. ‘Trigger’ refers to a specific act or situation that provokes or aggravates the symptoms and are important for the differential diagnosis for vertigo / dizziness. Vestibular problems due to BPPV should cause vertigo upon lying down, and also during the upright movement; but if the problem occur only during the upright movement, then the probable underlying cause could be of cardiac origin such as orthostatic hypotension [24].

Although dizziness is a non-specific symptom, it affects patient’s quality of life (QOL). Bronstein, Adolfo M et al evaluated QOL and social impact of dizziness in the cities, and its findings highlighted the high social and economic impact of dizziness [3]. Subjectivity of the dizziness makes it difficult for the clinicians to quantify it. The Dizziness Handicap Inventory (DHI) is one of the most popular questionnaires for assessment and grading of the dizziness [11]. It was developed by Jacobson GP and Newman CW. The DHI is a self-reported questionnaire designed to determine dizziness-dependent changes grouped into three domains: Functional (36 points), emotional (36 points), and physical (28 points) (Total score range 100-0). Higher the score more the perceived handicap because of the vertigo / dizziness [6]. It is used to assess QOL. We have used DHI score for the evaluation of the treatment as well as QOL impact in our study.

The present study was conducted to review the common disorders related to dizziness, its impact on QOL and management.

Materials and Method:

STROBE-Cohort reporting guidelines were followed for this study.

Study design : This is a retrospective, observational, descriptive study of patients presenting with dizziness in our medical facility.

Setting : This study was conducted at Aster Clinic, Dubai, United Arab Emirate (UAE). It is a retrospective review of the data of the patients presenting in our otolaryngology clinic between September 2019 to March 2022.

The study was approved by independent local ethics committee. Informed consent was taken from all the patients.

Participants : A total of 389 patients were enrolled in the study. Every (male and female) patient of all ages suffering from dizziness or vertigo, who visited the clinic during the said duration and voluntarily gave informed consent for study participation was included in the study. The patients who did not come for follow-up visit were excluded from the study.

Variables : Variables were age, gender, presenting symptoms and DHI score. DHI score was used to assess the severity of dizziness and QOL; and ‘SO STONED’ questionnaire tool for patient assessment is used at our centre.

Statistical analysis : All statistical analyses were performed using Stata version 15.0 software.

Results:

Demographics:

A total 389 patients were included in the study, out of which 58.61% were male and 41.39% were females. Average age of the patient was 42.69 years ($\pm$ 9.87 years), and median age was 44 years. The oldest patient enrolled was of 71 years old while the youngest was 12 years. Of the total 389 subjects, five patients (12-15 years of age, two males, three females) were of the pediatric age group.

Comorbidities:

Comorbidities observed among the patients were dyslipidemia (14.14%), hypertension (7.97%), and diabetes mellitus (5.40%).

Types of Dizziness:

Most patients reported having spinning type of dizziness (vertigo) (65.30%), followed by instability (disequilibrium), lightheaded while 4.37% of the patients were unable to describe the symptoms. (Fig.1)

Associated features:

Nausea/vomiting was the most common feature associated with dizziness as observed in 44.73% of the subjects. Followed by ear fullness, tinnitus, hearing loss, and photophobia as presented in Fig.2.

Duration of dizziness :

For 46.27% of the patients, dizziness lasted for few seconds-minutes, 38.05% of the patients reported the dizziness duration to be minutes-hours whereas 18% of the patients reported the duration to be hours to days.

Triggers :

‘Head movement’ was most reported trigger by the patients (61.18%). Two subjects reported the trigger to be ‘sound’. For one subject dizziness was triggered by trauma. However; 38.05% subjects reported that the dizziness was spontaneous; with no specific trigger.

Diagnosis:

Maximum patients (56.30%) were diagnosed with benign paroxysmal positional vertigo (BPPV) followed by Meniere’s Syndrome (13.11%), vestibular migraine (9.77%), vestibular neuronitis (9.77%), functional dizziness (6.42%) and vestibular paroxysmia (2.06%). Two patients each were of labyrinthitis, multiple sclerosis, and transient ischemic attack (TIA). One patient each of cardiac, posterior circulation stroke, post-concussion, and superior canal dehiscence syndrome.

In the patients diagnosed with BPPV, 166 subjects had posterior canal BPPV, 18 subjects had lateral canal BPPV.

Dix-Hallpike maneuver was the most used diagnostic modality. (Image 1)

Treatment:

Particle repositioning maneuvers (Epley’s canalith-repositioning maneuver) (Image 2) was observed to be most used method for the management of the dizziness. The patients with posterior canal BPPV were treated with Epley’s canalith-repositioning maneuver. Subjects with lateral canal BPPV were treated with Barbecue Roll maneuver. All other subgroups were treated as per standard pre-existing management guidelines, which also included neurology/ neurosurgery/ psychiatry referrals. The patients with recurrence required further testing and multidisciplinary team management.

DHI score :

The average baseline DHI score was 19.37 ($\pm$ 13.46) with range of 0 to 64, which reduced to 9.22 ($\pm$ 10.94) 3 weeks after treatment (p value <0.0001) as presented in Fig.3.

Discussion :

In our study population 58.61% of the subjects were male. The average age of study population was 42.69 years. However, Neuhauser, H K reported that dizziness is two to three times more prevalent in women than in men[14]. A neurotologic survey study reported that the prevalence of vestibular-borne dizziness in adults with ages 18 to 79 years was estimated at 7.4% (95% CI: 6.5 to 8.3%), and the frequency was three times greater in the elderly than in young adults [15, 18].

Diagnosing causes of dizziness can be difficult due to the subjective, non-specific symptom and with wide range of differential diagnosis. Hence, patient centric history taking is most important for understanding and the management. History taking should focus on dizziness description as well as prior medication. Questioning regarding symptoms, frequency of occurrence, time of onset, duration and trigger for dizziness and associated symptoms would help to narrow the diagnosis of dizziness. This approach is known as ‘SO STONED’. ‘SO STONED’ stand for (i) S = Symptoms: Characterization of the symptoms helps to locate the problem (ii) O= Often: Frequency of attack of vertigo /dizziness (iii) S = Since: This focuses on how long the symptoms already exist (iv) T=Trigger: A specific act or situation that provokes or aggravates (v) O = Otology (vi) N = Neurology: To rule out lesions of the central nervous system (vii) E = Evolution: Evolution of symptoms (viii) D = Duration: It is particularly important for differential diagnosis [24]. In the present study mostly reported associated symptom was nausea/vomiting and the trigger was ‘head movement’. 46.27% of the patients reported the duration of dizziness to be few seconds-minutes.

TiTrATE is also a patient assessment tool for vertigo / dizziness [13]. The approach uses the Timing of the symptom, the Triggers that provoke the symptom, And a Targeted Examination. The responses place the dizziness into one of three clinical scenarios: episodic triggered, spontaneous episodic, or continuous vestibular [10]. Similarly, HINT (HI: Head Impulse, N: Nystagmus direction and TS: Testing Skew) is a diagnostic tool for dizziness proposed to differentiate between acute peripheral vestibular lesions from central [7]. In our study most cases of dizziness were due to the peripheral causes.

ICVD-I by the Committee for the Classification of Vestibular Disorders of the Barany Society classified vertigo and dizziness based on the description as (i) Vertigo (ii) Dizziness (iii) Vestibulo-visual symptoms (iv) Postural symptoms [2]. In our study population, vertigo [spinning dizziness] (65.30%) was the most common type followed by vestibulo visual [disequilibrium] (17.22%) and postural symptoms [lightheadedness] (13.11%). A study Post, Robert E et al similarly reported vertigo (45-54%) to be a common type followed by disequilibrium (up to 16%), presyncope (up to 14%) and lightheadedness (approximately 10%) [16].

ICVD-I by the Committee for the Classification of Vestibular Disorders of the Barany Society further classified vertigo and dizziness based on the trigger as spontaneous and triggered [2]. In the present study head motion (61.18%) was the most reported trigger. Only two subjects reported sound-induced dizziness and one subject had trauma. For 148 (38.05%) subjects, dizziness was spontaneous.

Vertigo includes BPPV, vestibular neuritis (viral infection of the vestibular nerve), labyrinthitis (infection of the labyrinthine organs), and Meniere disease (increased endolymphatic fluid in the inner ear) [5,16]. Poor vision commonly observed with disequilibrium [16]. TIA and stroke are important causes underlying disequilibrium [16]. Kerber, Kevin A et al reported that 0.7% patients with isolated dizziness symptom had a stroke/TIA [8]. In the present study two subjects were diagnosed with TIA.

BPPV is the most common cause of dizziness/vertigo worldwide with a lifetime prevalence of 2.4%, a 1-year prevalence of 1.6%, and 1-year incidence of 0.6% [9, 22]. This concurs with our study findings where 56.30% subjects were diagnosed with BPPV.

The Dix-Hallpike maneuver is a diagnostic tool for BPPV. The Dix-Hallpike maneuver is the gold standard for diagnosing benign positional paroxysmal vertigo caused by a posterior canal otolith[1]. It was the most used diagnostic modality in our study.

Presently accepted treatment for BPPV is the canalith repositioning maneuver (CRM) described by Epley in 1992 [4]. It was the most and successfully used management in our study. This concurs with the meta-analysis findings by Prim-Espada, M P et al, who reported that, the BPPV patients managed by Epley’s maneuver had a six and half times more chance of improvement in the clinical symptoms [17]. Wang, Yi-Hong et al, in the study for BPPV management in primary care recommend the use of the Epley’s maneuver and barbecue roll for the treatment of posterior semicircular canal-BPPV and horizontal semicircular canal-BPPV, respectively [23].

The eyes move in the direction of the endolymph in the semicircular canals. The endolymph movement in

the canal either stimulates or inhibits the respective canals. The horizontal canals try to push the eyeballs to the opposite side whereas the vertical Canals try to pull the eyeball in their respective planes. The Superior (Anterior) Canal tries to pull the eyeball up whereas the Inferior(Posterior) canal tries to pull the eyeball down following the Ewald's second and third law.

In Dix Hallpike test a down beating nystagmus in supine position (right or left) indicates Anterior canal and up beating nystagmus indicates Posterior canal involvement. If posterior canal is involved (upbeat nystagmus), side can be determined either by side on which nystagmus is seen, or if seen on both sides (bilateral posterior canal BPPV), by the direction of torsional component. Torsional component direction can be made more obvious by asking patient to look down while performing in Dix Hallpike test, and torsional component would beat in the direction of the involved canal. After being sure of side, Epley's maneuver or Semont's maneuver for that side can be done. If despite proper side localization and despite repeated Epley's or Semont's, patient is not relieved of symptoms, recalcitrant or short arm posterior canal BPPV should be considered. In which case, the supine head flexion test should be done to look for up-beating nystagmus. The presence of upbeat pseudo-spontaneous nystagmus in sitting position would also give a clue for same.

Lateral (Horizontal) canalolithiasis is characterized by a geotropic nystagmus whereas cupulolithiasis is characterized by apogeotropic nystagmus in any lateral positions. Most intense nystagmus gives the side of canal involved irrespective of canalolithiasis and less intense the side of cupulolithiasis . In geotropic variant turning to the affected side gives maximum intensity nystagmus and in apogeotropic turning to the affected side gives less intensity nystagmus. In supine position nystagmus is on the opposite side in canalolithiasis and same side in cupulolithiasis. In geotropic variant (bowing / pitch forward) the direction of nystagmus gives side of the affected ear. In apogeotropic variant (leaning backwards / pitch backwards) the direction of nystagmus gives side of the affected ear. Initial pseudo-spontaneous nystagmus in canalolithiasis will be towards the opposite side.

If anterior canal involvement can also be confirmed with supine head extension test and , irrespective of side, the Yacovino maneuver is advised to correct it.

Dyslipidemia was the common most comorbidity in our study population followed by hypertension, and diabetes mellitus. The role of comorbidities (dyslipidemia, hypertension, and diabetes mellitus in peripheral vestibular diseases is a matter of further research. As our study was retrospective and we did not intend to find any correlation between comorbidities and vertigo / dizziness. It would be difficult for us to comment on the co-relation of comorbidities with peripheral dizziness. However, a study by Shreenivas V reported that the presence of comorbidities worsens the status of BPPV and increases the risk of recurrence even after successful repositioning maneuver [19]. There are also studies showing correlation between comorbidities and vestibulopathies [12, 21].

In the present study, the average baseline DHI score was 19.37 ($\pm$ 13.46) with range of 0 to 64, which reduced to 9.22 ($\pm$ 10.94) three weeks after treatment (p value <0.0001); showing improvement in the symptoms as well as QOL. Most causes of dizziness were peripheral.

Conclusion :

Vertigo / dizziness related to peripheral causes accounts for a significant proportion of cases in routine otolaryngology practice. From our study we can easily conclude that vertigo / dizziness related disorders negatively affect QOL. Proper diagnosis and management would help to improve the symptoms and QOL. Simple office-based, patient-oriented detail history taking, and clinical examination is important in the diagnosis and management of the dizziness. History taking or questions should focus on the type of dizziness, associated features, duration, and triggers which would help in pinpointing differential diagnosis and the management. Red flags like focal neurological signs should be taken seriously and investigated further.

List of abbreviations :

BPPV: Benign paroxysmal positional vertigo

DHI: Dizziness Handicap Inventory

ICVD-I: International Classification of Vestibular Disorders I

QOL: Quality of life

TIA: Transient ischemic attack

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Figures and Tables:

Figure 1: Types of Dizziness

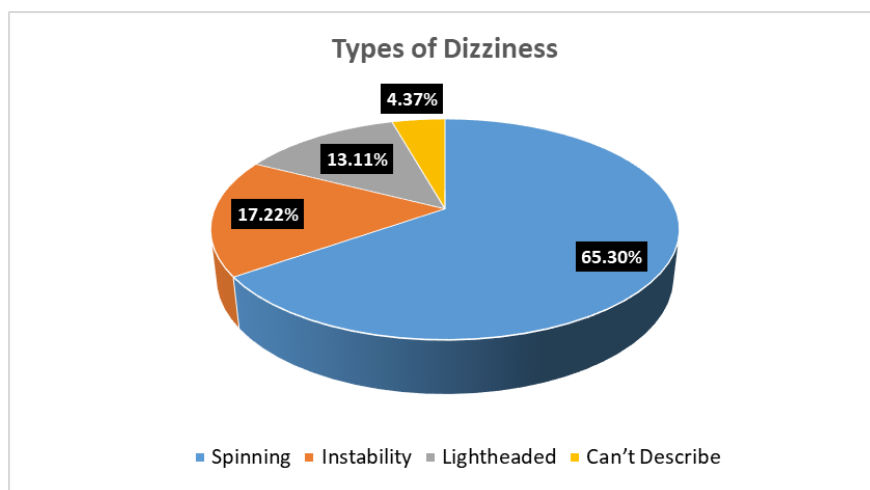


Figure 2: Associated features

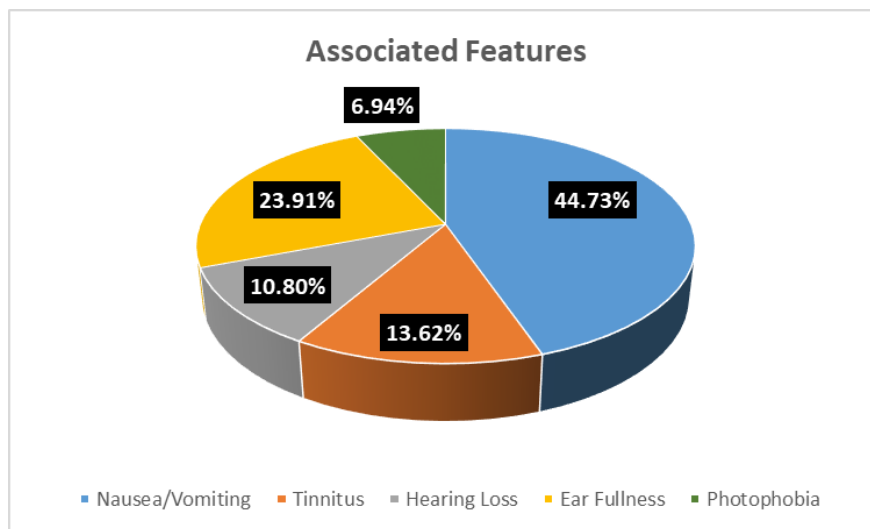
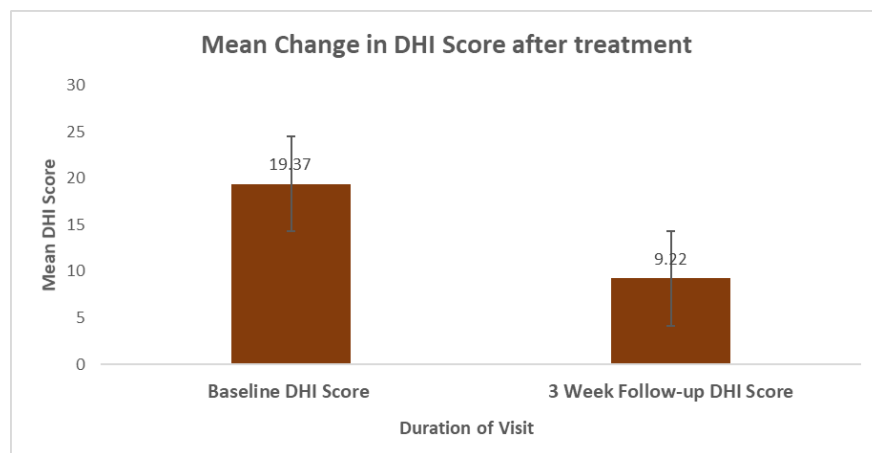


Figure 3. Mean change in DHI score post treatment



Images:

Image 1: Dix-Hallpike maneuver

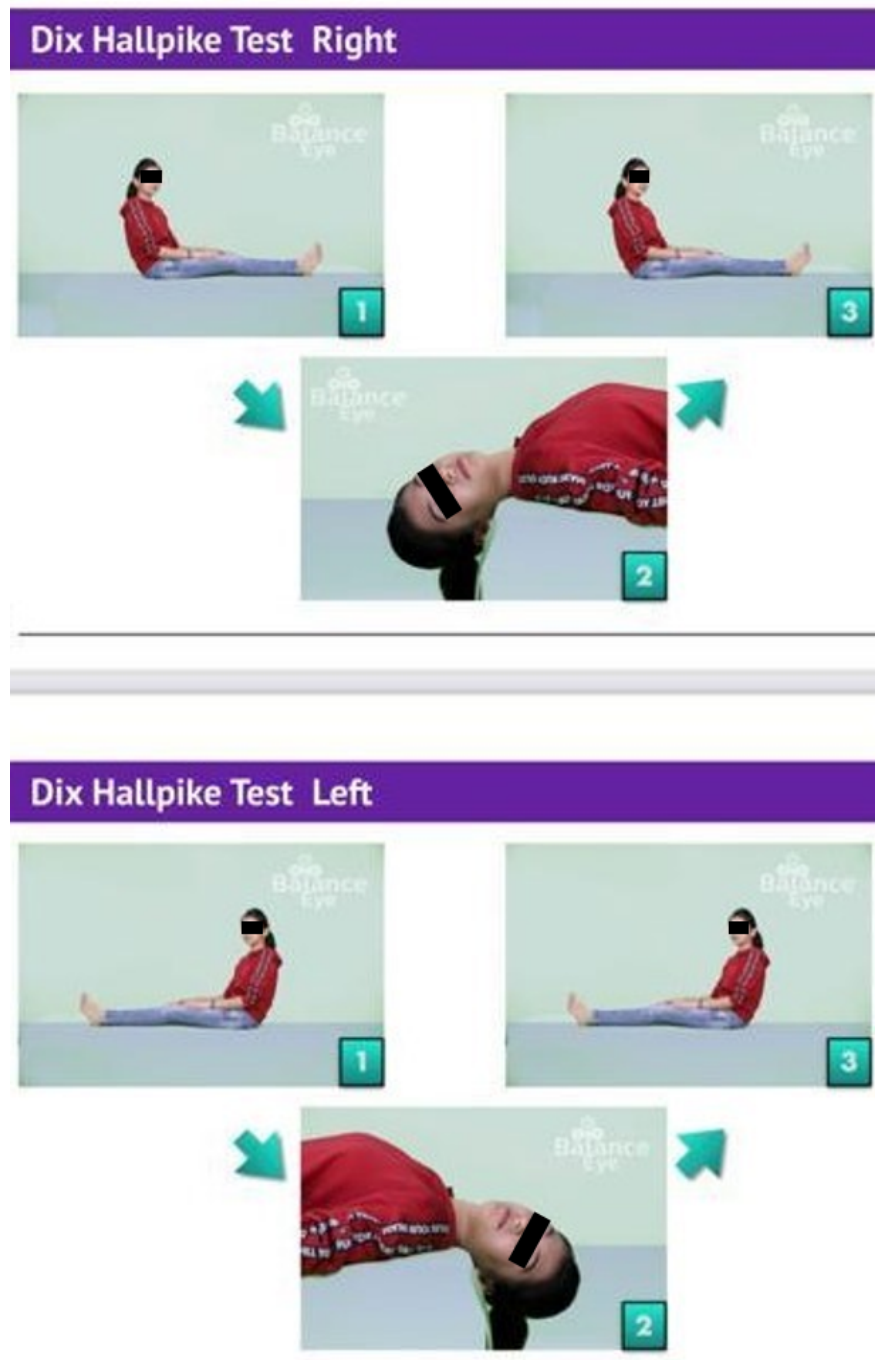


Image 2: Epley's canalith-repositioning maneuver

Epley Maneuver for Right Posterior Canal BPPV



Epley Maneuver for Left Posterior Canal BPPV

