ORIGINAL RESEARCH PAPER
Volume-9 | Issue-5 | May-2020 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

HORIZONTAL CANAL BENIGN PAROXYSMAL POSITIONAL VERTIGO WITH CANAL CONVERSION; CASE REPORT

Otolaryngology

Eyad Abu Nahleh* MD *Corresponding Author
Sawsan Abuzaid MD
Motasem Al_Krymeen MD
Osama Olwan MD
Halimeh Yamin MD

ABSTRACT

Benign Paroxysmal Positional Vertigo (BPPV) is considered as the commonest reason of chronic vertigo in the otolaryngology clinic (1). In the company of two different etiologies; either otolith (CaCO3 crystals) floating freely within the perilymphatic fluid of the semicircular canals (canalithiasis) or stucked to the cupula of the semicircular canals (cupulothiasis). Mostly they present with periodic attacks of vertigo that's triggered by positional changes in the head movement. The attacks are usually intense and severe. The posterior semicircular canal is the most repeatedly caught up canal (2). In case of horizontal semicircular canal BPPV,it is found to be as new diagnosis, with an incidence of 3-8% of all types of BPPV (3), HC-BPPV is not an exceptional condition. In our study we present a patient who was diagnosed to have horizontal canal BPPV. The patient was treated conservatively via different otolith repositioning maneuvers which are complicated by canal conversion. Finally and successfully he was treated with total declaration of symptoms.

KEYWORDS

INTRODUCTION

The most familiar source of chronic episodic vertigo in the otolaryngology and neurology clinics is BPPV (4).

Patients who were found to have BPPV generally present with sporadic attacks of intense vertigo induced by changes in head positions. There are two main theories explaining BPPV etiology. The first one is canalithiasis, in which the otolith moves freely inside the cavity of the semicircular canals. The second one is cupulothiasis, in which the otolith is trapped to the cupula of the semicircular canals (5).

The majority of BPPV is Posterior Canal-BPPV (90%). The second most common is the Horizontal Canal-BPPV with a frequency of (5-30%) (6). In our practice HC-BPPV is diagnosed more frequently than earlier (7). PC- BPPV is clinically diagnosed by Dix hallpike maneuver [figure (1)] ,in which the patient changes his position from sitting to supine with his head turned 45 degrees to the right or left side and his head hangs 30 degrees below the bed. In Dix hallpike maneuver if vertigo develops with a nystagmus of special characteristics including latency and reversal the test is considered positive. (8), HC-BPPV is usually diagnosed by the supine roll test [figure (2)] in which the patient lies in the supine position, and his head is turned 90 degrees to the right or 90 degrees to the left side, a horizontal nystagmus develops with special characteristics if the test is positive. If the nystagmus is horizontal towards the ground in both positions it is called geotropic nystagmus. If it is horizontal with the fast component beating towards the ceiling this is called ageotropic nystagmus. Ageotropic nystagmus is caused by either cupulothiasis which can be canal sided/utricular sided or horizontal canal anterior arm canalithiasis (9).

The treatment options for horizontal canal ageotropic form include head- shaking in the horizontal plane, asprella maneuver or Gufoni maneuver (10). The aim of the treatment options is to remove the otolith from the cupula or to remove the otolith from the anterior arm of the horizontal canal. In the cupulothisis when the otolith are utricular sided or when they are in the anterior arm of the horizontal canal the repositioning maneuvers shift the otolith to the posterior part of the horizontal canal, this converts the nystagmus to the geotropic form of the horizontal canal BPPV, and requires new repositioning maneuvers to return them to the utricle itself (11).

The treatment options for the special forms of BPPV include; Epley's and Semont's for PC-BPPV, Barbecue and Lempert maneuver for the HC-BPPV (geotropic form), Yacovino maneuver for the superior canal BPPV (12).

Epley's maneuver is highly effective with 90.7% success rate after the first time, and 96% complete symptoms relief after the second time (13). The success rate of Barbecue maneuver is 75% with a range of 50-100% (14). Barbecue maneuver is successful for horizontal canal canalithiasis or otolith that is canal sided. On the other hand it is not successful for otolith that is utricular sided (15).

Case presentation

A 57 year old male, HTN on treatment, Presented with vertigo and imbalance for 25 years duration. The vertigo was positional, related to head movements to the right and left side lasts usually seconds, there was no associated aural fullness or tinnitus, and with no neurological symptoms. Also there was no headache. His vertigo was not induced by loud sounds or cough and sneezing.

In the physical exam, the patient was conscious, oriented, Normal cranial nerve exam. Ears: Rt : dry central perforation. Lt: dry anterior perforation. The patient had no spontaneous or gaze evoked nystagmus. Head impulse test was negative bilaterally. Fistula sign was negative bilaterally. High Frequency Head Shake Test was negative, Vertebrobasilar Artery Screening Test was negative, Dix hallpike test [figure (1)] was negative bilaterally. Supine Roll test [figure (2), showed bilateral horizontal geotropic nystagmus, with more severe symptoms when the lowermost ear is the Right ear. Hearing assessment showed moderate conductive hearing loss on the both sides [figure (3)].

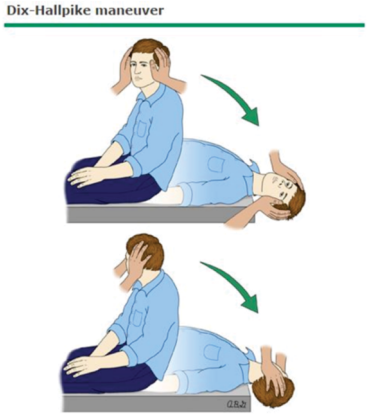

Figure (1): dix hallpike test for the diagnosis of posterior canal BPPV.

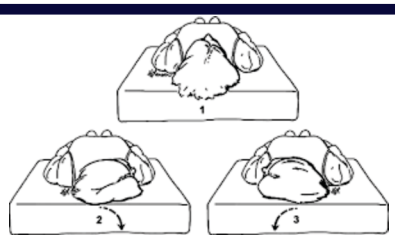

Figure (2): Supine Roll test for the diagnosis of horizontal canal BPPV.

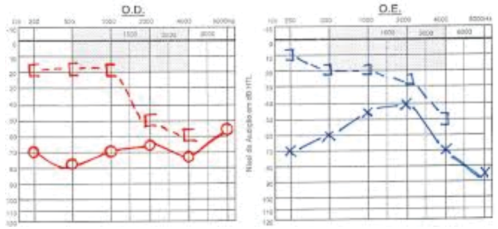

Figure (3): bilateral Pure Tone Audiograms for the patient showing bilateral moderate conductive hearing loss.

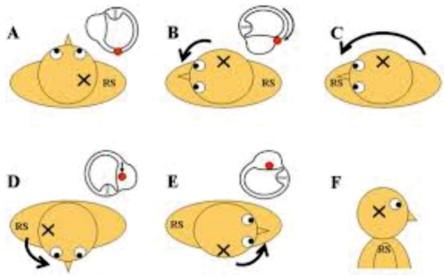

Figure (4): Barbecue maneuver for the treatment of Right horizontal canal BPPV with canalithiasis.

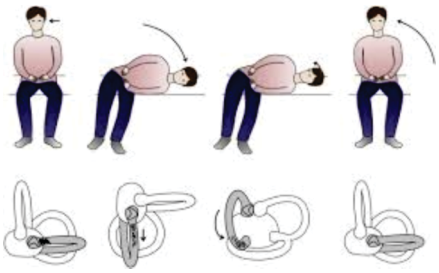

Figure (5): Appiani maneuver for the treatment of left horizontal canal BPPV with anterior arm canalithiasis.

Figure (6): Epley's maneuver for the treatment of left posterior canal BPPV.

Treatment:

After performing the supine roll test with bilateral horizontal geotropic nystagmus seen, BARBIQUE MANOEVER [figure (4)] was performed, in which the head was turned 270 degrees away from the involved (Rt ear).the patient was asked to come back and to be retested few days after that, and he stated that he still complains of vertigo, So supine roll test was performed another time and showed bilateral apogeotropic horizontal nystagmus with more severe symptoms when the lowermost ear is the left. So APPIANI manoever [figure (5)] was performed .supine roll test was performed another time and showed bilateral geotropic horizontal nystagmus.

So BARBIQUE maneuver was performed again. the patient came back one week after the positioning maneuver , he was still complaining of mild positional vertigo; supine roll test was performed and was negative, Dix hallpike test was done and showed upward torsional nystagmus when the lowermost ear was the Rt ear, so epley's manoever [figure (6)] was performed.

The patient came back to the clinic one week after the last positioning maneuver ,and he had no vertigo at all, and the balance improved 90% according to the patient. Follow up for the patient was done three months after that and he had no recurrence of symptoms and retesting the patient was negative for both dix hall-pike and supine roll tests.

DISCUSSION

BPPV is caused by otolith that travels from the utricle to one of the three semicircular canals. With the posterior form the most common type. The etiology is unknown but it could be correlated to a head trauma, infection or structural degeneration . Horizontal canal BPPV is a newly diagnosed illness, patients with horizontal canal BPPV present with positional vertigo, in which the vertigo is triggered by moving the head to both sides, mainly in the supine position and lasts for minutes. It is diagnosed after appropriate history and bed side tests for nystagmus with special characteristics.

In this case the patient had attacks of vertigo, when he moves his head in the supine position to both directions. The attacks were more severe on the Right side. When performing the Supine Roll test at presentation patient had bilateral geotropic horizontal nystagmus with more severe vertigo and more intense nystagmus on the Right side, indicating that he had Right horizontal canal canalithiasis, which was treated initially by barbecue maneuver.

Few days later the patient was retested and supine roll test was performed again. The test result was bilateral apogeotropic nystagmus with more severe symptoms and intense nystagmus on the left side indicating that the patient had right horizontal canal anterior arm canalitiasis that was first treated by performing Appiani maneuver to move the otolith from the anterior arm to the posterior arm of the right horizontal canal that was retreated again by another Barbecue maneuver.

At the third appointment the patient was still complaining of mild positional vertigo. the supine roll test was performed and it was negative indicating that the resolution of the horizontal canal symptoms , but the dix hall-pike test was positive with an upward geotropic nystagmus when the right ear was the lower most ear , indicating that a right posterior canal canalithiasis. This was treated by performing epley's manoever.

In the next visits, negative dix hall-pike test and supine roll test indicates resolution of the disease from the right posterior and horizontal semicircular canals.

In this case we can demonstrate the significance of retesting the patients with Benign Paroxysmal Positional Vertigo after repositioning maneuvers. Repositioning maneuvers can be complicated by canal conversion as in this case, in which the otolith moved from the canal in the right horizontal semicircular canal to the anterior arm of the same canal after performing Barbecue maneuver the first time. that was treated by Appiani maneuver for the conversion of the otolith from the anterior arm to the posterior arm of the right horizontal canal, and then barbecue maneuver was done to reposition the otolith to the utricle, but they were converted to the right posterior canal instead, that was shown by a positive dix hall-pike maneuver, so epley's maneuver was done finally to reposition the otolith back to the utricle. Finally it was successfully finished with resolution of the symptoms of the patient. in addition was confirmed by negative positioning tests.

Retesting should also be done to be sure from the effectiveness of the repositioning maneuver. Since not all the repositioning maneuvers are effective from the first time. Epleys therapy was highly effective: with success rate 90.7% for the first time, and 96.0% after performing it the second time .The mean effective rate of BRM for HC-BPPV was 75%, with a reported range of 50–100% .So the patient might need the

repositioning maneuver performed more than one time.

In addition to that patients who still complain of vestibular symptoms during the follow up periods despite of the repositioning maneuvers done should have further vestibular assessment tests to rule out other central or peripheral vestibular diseases.

CONCLUSION

The importance of the follow up and retesting of patients with benign paroxysmal positional vertigo, who underwent otolith repositioning maneuvers, to be sure that the maneuver is effective from the first time, without the need for another trail. Also to make sure that the patient's condition is not complicated by canal conversion, or he doesn't have other peripheral or central vestibular disorders.

REFERENCES

1. Furman JM, Cass SP. Balance Disorders: A Case-Study Approach. Philadelphia, Pa, USA: F. A. Davis; 1996.
2. Korres SG, Balatsouras DG, Papouliakos S, Ferekidis E. Benign paroxysmal positional vertigo and its management. Med Sci Monit. 2007;13:CR275–82. [PubMed]
3. Chung KW, Park KN, Ko MH, Jeon HK, Choi JY, Cho YS, et al. Incidence of horizontal canal benign paroxysmal positional vertigo as a function of the duration of symptoms. Otol Neurotol. 2009;30:202–5.[PubMed]
4. Balatsouras DG, Koukoutsis G, Aspris A, Fassolis A, Moukos A, Economou NC, et al. Benign Paroxysmal Positional Vertigo Secondary to Mild Head Trauma. Ann Otol Rhinol Laryngol. 2017;126:54–60. [PubMed]
5. Lee SH, Kim JS. Benign paroxysmal positional vertigo. J Clin Neurol 2010;6:51-63. [PMC free article] [PubMed]
6. Parnes LS, Agrawal SK, Atlas J. Diagnosis and management of benign paroxysmal positional vertigo (BPPV). CMAJ 2003;169:681-93. [PMC free article] [PubMed]
7. Nuti D, Mandala M, Salerni L. Lateral canal paroxysmal positional vertigo revisited. Ann N Y Acad Sci 2009;1164:316-23. [PubMed]
8. Dix MR, Hallpike CS. The pathology symptomatology and diagnosis of certain common disorders of the vestibular system. Proc R Soc Med. 1952;45:341–354. [PMC free article] [PubMed]
9. Schubert MC. Stop the world – I want to get off. Vestibular SIG Newsletter. BPPV Special Ed 2013;17.
10. Yamanaka T, Sawai Y, Murai T, et al. New treatment strategy for cupulolithiasis associated with benign paroxysmal positional vertigo of the lateral canal: the head-tilt hopping exercise. Eur Arch Otorhinolaryngol 2014;271:3155-60. [PubMed]
11. Lee SH, Kim JS. Benign paroxysmal positional vertigo. J Clin Neurol 2010;6:51-63. [PMC free article][PubMed]
12. Shim DB, Song CE, Jung EJ, Ko KM, Park JW, Song MH. Benign paroxysmal positional vertigo with simultaneous involvement of multiple semicircular canals. Korean J Audiol. 2014;18:126–30. [PMC free article] [PubMed]
13. Babac S, Arsović N. Efficacy of Epley maneuver in treatment of benign paroxysmal positional vertigo of the posterior semicircular canal. Vojnosanit Pregl. 2012;69:669–674. doi: 10.2298/VSP1208669B. (In Serbian) [PubMed] [Cross Ref]
14. Mandalà M, Pepponi E, Santoro GP, Cambi J, Casani A, Faralli M, Giannoni B, Gufoni M, Marcelli V, Trabalzini F, et al. Double-blind randomized trial on the efficacy of the Gufoni maneuver for treatment of lateral canal BPPV. Laryngoscope. 2013;123:1782–1786. doi: 10.1002/lary.23918. [PubMed] [Cross Ref]
15. Riga M, Korres S, Korres G, Danielides V. Apogeotropic variant of lateral semicircular canal benign paroxysmal positional vertigo: is there a correlation between clinical findings, underlying pathophysiologic mechanisms and the effectiveness of repositioning maneuvers? Otol Neurotol. 2013;34:1155–1164. doi: 10.1097/MAO.0b013e318280db3a. [PubMed] [Cross Ref]