ORIGINAL ARTICLE

A New Physical Maneuver for the Treatment of Benign Paroxysmal Positional Vertigo

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Benign paroxysmal positional vertigo, which is the most common peripheral vestibular disorder, is characterized by brief episodes of vertigo that are associated with certain rapid changes in head position. Physical maneuvers are currently considered the method of choice for treating this condition. The aim of this study was to describe an alternative physical maneuver for the treatment of benign paroxysmal positional vertigo and assess its effectiveness. The idea of implementing this new maneuver occurred after the report of a patient with benign paroxysmal positional vertigo in whom rapid successive head movements performed inadvertently caused the complete resolution of symptoms. We evaluated 58 consecutive patients with benign paroxysmal positional vertigo who were treated with this new physical maneuver. Fifty-five of those patients had posterior canal benign paroxysmal positional vertigo, and 3 patients had horizontal canal benign paroxysmal positional vertigo. The diagnosis was based on each patient's symptoms and the results of the Dix-Hallpike test. The response to the treatment maneuver was excellent, and 49 patients (84.5% of the study group) experienced complete resolution of their symptoms after a single treatment. This maneuver can be performed by a physician or the patient if symptoms recur.

Benign paroxysmal positional vertigo (BPPV) is the most common peripheral vestibular disorder. It was initially defined as a clinical entity by Bárány in 1921, and the term "benign paroxysmal positional vertigo" was first used by Dix and Hallpike in 1952.[1] BPPV is characterized by brief episodes of rotatory vertigo and concomitant positional rotatory nystagmus that is elicited by rapid changes in head position relative to gravity.[1,2] The most frequently reported motion that provokes BPPV is getting in and out of bed. It also occurs while the patient is attempting to turn over in bed, tries to reach a shelf located above his or her head level, or bends over.[2]

BPPV is considered a mechanical disorder. It occurs when debris is dislodged from the otoconial membrane of the utricular macula and migrates to any of the semicircular canals through their nonampullary end. These particles congeal and form a clot that either floats freely within the lymph of the canal and causes canalolithiasis[3-7] or adheres to the cupula and causes cupulolithiasis.[8, 9] When the head is rotated on the plane of maximal excitation of the involved semicircular canal, an unusually strong endolymphatic current is produced as a result of the specific gravity of the freely flowing debris.[2] The displacement of the ampulla causes rotatory vertigo and rotatory-linear nystagmus. The posterior semicircular canal is affected more frequently than are the horizontal and the anterior canals.

BPPV is usually a self-limiting condition, and the symptoms it produces gradually subside over several weeks or months.[2] Some patients experience a recurrence months or years later. Drug therapy has been of no help.[2] Physical treatment is a rational therapeutic option in patients in whom the symptoms of BPPV are not self-limited.[10]

Current treatment for BPPV includes rehabilitative exercises[10,11] and physical positioning maneuvers. Various types of physical maneuvers and exercises have proven effective. Semont and colleagues introduced a single liberatory maneuver.[12] In 1992, Epley described a variation of that maneuver during which the posterior canal is rotated with successive head positionings so that the debris is dispersed from the canal toward the utricular cavity.[6] Epley's maneuver was later modified by Herdman and colleagues.[13] If performed properly, all those treatments are effective.

The aim of this study was to assess the effectiveness of an alternative physical treatment that is believed to act as a liberatory maneuver. This new maneuver was developed after the report of a patient with pBPPV who experienced complete resolution of his symptoms after inadvertently performing a series of rapid successive head movements.

MATERIALS AND METHODS

Fifty-eight consecutive patients with BPPV were studied from September 2002 to September 2004. Fifty-five patients had BPPV of the posterior semicircular canal, and 3 patients had BPPV of the horizontal semicircular canal. The diagnosis was based on each patient's medical history, his or her symptoms, and the results of the Dix-Hallpike test performed with the use of Frenzel lenses. Only patients with idiopathic BPPV were included in this preliminary study. The onset of symptoms, which occurred intermittently, ranged from a few days to 2 years before the use of the maneuver. Twenty men and 38 women were the subjects of this study. Three women were diagnosed as having BPPV of the horizontal semicircular canal. The age of the patients ranged from 30 to 67 years (mean age, 47 years). BPPV was identified in 31 right ears and in 27 left ears. All the patients were treated with this new maneuver, the idea for which was developed after the report of a patient with pBPPV who was scheduled for treatment with the Epley maneuver. A day before his scheduled appointment, he experienced complete resolution of his symptoms after he inadvertently performed a series of rapid successive head movements.

The maneuver consists of the following rapid successive head movements: from the neutral position (facing forward) to a full lateral turn; then a rapid head movement from one side to the opposite side in a full lateral turn (Figure 1). The patient should be seated in an upright position and facing forward. The physician should stand facing the patient. The physician should

then firmly grasp the patient's head with both hands (1 hand on each side of the patient's head) and should turn the head 90° to the right or left. The head should then be turned 180° to the opposite side and then 180° to the contralateral side. The maneuver consists of 6 to 7 consecutive rapid head-turn movements (Figure 2). It is a brisk maneuver. The velocity of the head movement is considered very important.

Figure 1: Performance of the maneuver involves brisk successive head movements from a position facing forward, then to the right, and then to the opposite side (180°).

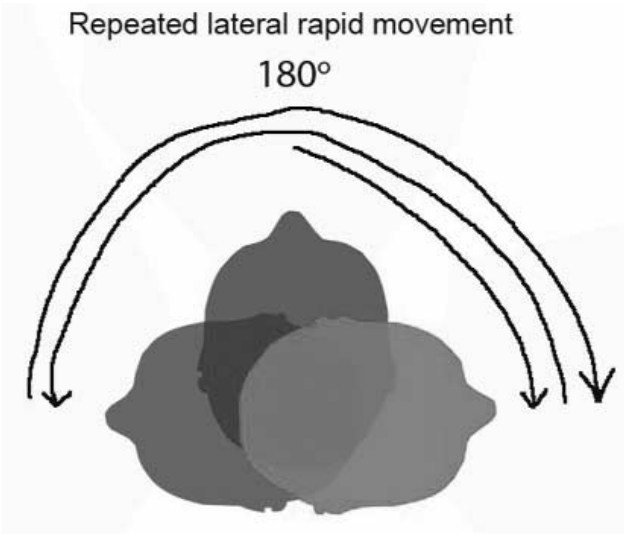

Figure 2: Repeated lateral rapid head movement (180°).

After being subjected to this treatment maneuver, each patient was questioned about his or her symptoms and was evaluated with a new Dix-Hallpike test.

RESULTS

Forty-nine patients (84.5%) were effectively treated with 1 treatment. Those individuals reported complete resolution of their symptoms, and the results of the Dix-Hallpike test confirmed the effectiveness of that treatment maneuver. The 3 patients with horizontal canal BPPV were included in this group of responders. In 9 patients, no changes in the results of the Dix-Hallpike test were noted, although those subjects reported some resolution of their symptoms after the first treatment. Those 9 patients underwent a second treatment with the same maneuver 1 to 2 weeks after the first treatment. After the second maneuver, 5 of the 9 patients reported an improvement in symptoms, and 4 patients experienced persistent vertigo. The resolution of vertigo after the reported maneuver was remarkable and occurred immediately after the completion of the maneuver.

No modifications in the patients' daily activities and no limitations in head or body position were advised. The follow-up period varied from 2 months to 3 years (mean follow-up, 12 months). Ten patients reported 1 recurrence of pBPPV, and 6 patients reported experiencing 2 recurrences during that period. This information was obtained during follow-up visits.

DISCUSSION

Currently applied maneuvers for the treatment of BPPV, which can be performed as an office procedure, are designed to move debris out of the sensitive part of the ear (usually the posterior canal) to a less sensitive location. The Semont maneuver involves a procedure in which the patient is rapidly moved from lying on one side to lying on the opposite side.[12] The Epley maneuver, which is also called the particle repositioning procedure, is performed with or without the use of vibration.[6,14] The maneuver presented in this paper is believed to cause a highly accelerated endolymphatic current that results in the expulsion of free debris from the horizontal semicircular canal (Figure 3).

After undergoing any of the treatment maneuvers for BPPV that are described in this article, the patient

Figure 3: The right semicircular canals (frontal view) in the successive positions of the maneuver.

should be prepared to follow instructions designed to reduce the likelihood that debris might fall back into the sensitive part of the ear. [6,12,15] Although no lifestyle modifications or body and head posture limitations were recommended to our study participants, no increased incidence of recurrence was noted during the first 2 weeks. Eight subjects (16.3% of the cured patients) who were successfully treated with our maneuver experienced vertigo during that period and responded to a repeat maneuver. According some studies, the recurrence rate during first 2 weeks after the performance of a maneuver has varied from 10% to 20%.[1,13]

The currently applied treatments for BPPV are very effective; the cure rate is about 80%.[13] Nonresponders are usually advised to perform Brandt-Daroff exercises, which are effective in 95% of cases but are more arduous than office treatments. In most subjects who perform those exercises, complete relief from symptoms occurs after about 10 days.[10] In the rare cases in which all physical therapies have been tried for long periods and symptoms are still intolerable, surgical management (posterior canal plugging or surgical resection of the posterior ampullary nerve) may be offered.[1,16]

A factor of importance in our study was the high response rate of patients with BPPV to this new maneuver, especially because most of the subjects reported complete resolution of their symptoms immediately after the maneuver was performed. The cure rate was comparable to the reported cure rate of other currently applied maneuvers.

We anticipate that if the maneuver described in this study becomes an established treatment, nonresponders could participate in a second treatment maneuver trial. Patients with recurrent BPPV could safely perform the maneuver themselves at home. About 33% of patients are reported to experience a recurrence of symptoms during the first year after treatment, and by the fifth posttreatment year, about half of all patients have experienced a recurrence[14,17]. In our study group, 27.6% of the subjects reported a recurrence of pBPPV during the follow- up period (10 patients reported 1 recurrence, and 6 patients reported 2 recurrences).

BPPV is usually a self-limiting condition. Physical treatment is a rational therapy for patients whose symptoms are not self-limited.[1,13] Cross-sectional studies of the human ear suggest that the mechanisms involved in BPPV might not be completely understood with our current concept of otolith displacement.[18] There may be other factors that cause this common disorder and affect treatment results. Further studies are needed to investigate methods of improving the results of treatment and preventing recurrence. This preliminary study reports the initial results of this innovative maneuver in a small group of patients with BPPV. Prospective studies that involve a control group, the use of objective methods for the evaluation of vertigo, and a longer follow-up period will help to define the clinical value of the maneuver described in this report.

REFERENCES

1. Brandt T. Benign paroxysmal positioning vertigo. In: Brandt T, editor. Vertigo: its multisensory syndromes. 2nd ed. Berlin: Springer Verlag; 1999.
2. Mattox DE. Meniere's disease, vestibular neuronitis and paroxysmal positional vertigo and nystagmus. In: Ballenger JJ, Snow JB, editors. Otorhinolaryngology: head and neck surgery. Baltimore: Williams & Wilkins; 1996. p. 1119-32.
3. Hall SF, Ruby RR, McClure JA. The mechanics of benign paroxysmal vertigo. J Otolaryngol 1979;8:151-8.
4. Parnes LS, McClure JA. Posterior semicircular canal occlusion in the normal hearing ear. Otolaryngol Head Neck Surg 1991;104:52-7.

5. Parnes LS, McClure JA. Free-floating endolymph particles: a new operative finding during posterior semicircular canal occlusion. Laryngoscope 1992;102:988-92.
6. Epley JM. The canalith repositioning procedure: for treatment of benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg 1992;107:399-404.
7. Gordon AG. Benign paroxysmal positional vertigo (BPPV) or bubble provoked positional vertigo? J Neurol Sci 1992; 111:229-33.
8. Schuknecht HF. Cupulolithiasis. Arch Otolaryngol 1969;90:765-78.
9. Schuknecht HF, Ruby RR. Cupulolithiasis. Adv Otorhinolaryngol 1973;20:434-43.
10. Brandt T, Steddin S, Daroff RB. Therapy for benign paroxysmal positioning vertigo, revisited. Neurology 1994;44:796-800.
11. Brandt T, Daroff RB. Physical therapy for benign paroxysmal positional vertigo. Arch Otolaryngol 1980;106:484-5.
12. Semont A, Freyss G, Vitte E. Curing the BPPV with a liberatory maneuver. Adv Otorhinolaryngol 1988;42:290-3.
13. Herdman SJ, Tusa RJ, Zee DS, Proctor LR, Mattox DE. Single treatment approaches to benign paroxysmal positional vertigo. Arch Otolaryngol Head Neck Surg 1993;119:450-4.
14. Hain TC, Helminski JO, Reis IL, Uddin MK. Vibration does not improve results of the canalith repositioning procedure. Arch Otolaryngol Head Neck Surg 2000;126:617-22.
15. Massoud EA, Ireland DJ. Post-treatment instructions in the nonsurgical management of benign paroxysmal positional vertigo. J Otolaryngol 1996;25:121-5.
16. Parnes LS. Update on posterior canal occlusion for benign paroxysmal positional vertigo. Otolaryngol Clin North Am 1996;29:333-42.
17. Nunez RA, Cass SP, Furman JM. Short- and long-term outcomes of canalith repositioning for benign paroxysmal positional vertigo. Otolaryngol Head Neck Surg 2000;122:647-52.
18. Buckingham RA. Anatomical and theoretical observations on otolith repositioning for benign paroxysmal positional vertigo. Laryngoscope 1999;109:717-22.