

Collar Fixation as a Management Tool for Posterior Canal BPPV: Is it of Value

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Abstract

Objective: To determine the necessity of use the collar after canalith repositioning maneuver on success rate of management of posterior canal BPPV.

Methodology: 60 patients with posterior canal BPPV were included in this study. They were divided into two groups. Group I: Managed by Epley Maneuver and received post-maneuver instructions and the neck were fixed by collar for 4 days. Group II: The same management as group I but without collar fixation.

Results: there was a statistically significant difference in the outcome between the two groups with decrease the chance of recurrence in group I with the serial follow-up.

Conclusion: The use of collar fixation after canalith repositioning maneuver is necessary to improve outcome and decrease the chance of recurrence on posterior canal BPPV patients.

Keywords: BPPV; Vertigo; Canalith repositioning; Collar fixation

Introduction

The most common cause of vertigo is Benign paroxysmal positional vertigo (BPPV) [1,2]. There are many causes of BPPV such as head injury, vestibular degeneration, aging, iatrogenic after otological surgery, otitis media, feminine hormonal dysfunction, vertebrobasilar insufficiency or metabolic disorders. It may also result from labyrinthine disorders such as vestibular neuritis or Ménière's disease [3]. However, Pereira et al. [4] reported that about 50% of the cases are idiopathic in origin.

According to Caovilla et al. [5] the pathophysiology of BPPV is that the calcium carbonate crystals (otolith) either shift from the utricle to the semicircular canals (canalolithiasis) or adhere to the dome of these canals (cupulolithiasis). The presence of the displaced otolith causes the affected canal to become sensitive to changes in head position in the plane of this canal. 90% of BPPV cases affect the posterior canal, as it lies inferior to the utricle [6].

The diagnosis of BPPV can be achieved by clinical history and vertigo-causing maneuvers. The history is typically described by the patient as a brief episodes of sense of rotation, disappearing within seconds to 2:3 min. It occurs on head movement to certain positions. The diagnosis of posterior canal BPPV is confirmed by the maneuver that elicit vertigo and nystagmus namely the Dix-Hallpike test [7,8].

As regards the treatment options there is no medical treatment for BPPV. The treatment of choice are Maneuvers which have been developed and are used with a high rate of success [9,10]. One of these maneuvers is the Semont liberatory maneuver (SLM) which requires movement of the patient en bloc. This maneuver include a group of briskly position changes and it requires a good degree of patient

mobility [9]. So, the SLM is contraindicated in patients with orthopedic problems such as hip fractures or hip replacements [11]. Another maneuver for treatment of posterior canal BPPV is the canalith repositioning maneuver (CRM), modified from Epley. This maneuver requires only limited movement of the patient including head rotation and rolling to one side this provide maximum comfort for the patient [10]. For this reason, the CRM tend to be a preferred method of treatment. The success rate of these two maneuvers (CRM and SLM) was high it nearly of 80% after one session and more than 90% after two sessions [11,12]. Post-maneuver restriction are a part of the treatment protocol for BPPV. The idea of these restrictions is a prevention of the otoconial debris from returning to the semicircular canals after repositioning manuevers [13,14].

Objective

To determine the necessity of use the collar after canalith repositioning maneuver on success rate of management of posterior canal BPPV.

Methodology

Subjects

The present study included 60 patients already diagnosed as having posterior canal (PC) BPPV (from history and Dix Hall pick maneuver via VNG system).

Exclusion criteria: 1- patients with bilateral PC-BPPV or atypical BPPV. 2- patients with vertigo rather than PC BPPV.

The patients were divided into two groups. Group I: consists of 30 patients managed by Epley Maneuver and received post-maneuver

instructions and the neck was fixed by collar for 4 days. Group II: consists of 30 patients managed by Epply Maneuver and received post-manuever instructions but without collar fixation.

Procedure

The study was done after approval from Sohag Faculty of Medicine Ethics Committee. Informed consents were obtained from all subjects who agreed to participate in this study.

1) Each participant in the two groups was subjected to the following:

- A careful history taking.
- ENT examination including otoscopic examination, pneumatic otoscopic examination (Welch Allyn otoscope).
- The patients quantified the intensity on a scale of 1 to 3 (mild, moderate and severe).
- General and neurological examination to exclude other causes of vertigo.
- Epply maneuver was done for all patients.
- Post-manuever instructions (These instructions include avoidance of quick head movements or lying on the pathologic side, keeping the neck erect, sleeping at a 45° angle [15]).

2) Patients in group I were subjected to neck fixation by collar for 4 day.

3) Follow-up to all participant:

Time of follow-up: After 4 days, after one month and after three months.

Assessment during follow up visits:

- Subjective opinion of the patients about improvement.
- Positioning tests via VNG.

Equipment

Videonystagmography (VNG) Micomedical model.

Results

Group I ranged in age from 40 to 78 years (mean: 63) and consisted of 20 women and 10 men. Group II ranged in age from 42 to 76 years (mean: 62) and consisted of 22 women and 8 men. The involved ear was the left in 17 participants in group I and 20 participants in group II. History of prior episodes of BPPV was positive in 10 participants in group I and positive in 8 participants in group II (Table 1).

Discussion

The age range of the participants were from 40 to 78 years, with a mean value of 63 years. This is similar to the data obtained in different literature which concluded that BPPV is more common in the elderly [16,17]. The aging-related changes in the body balance system, the greater incidence of degenerative disorders and the chronic use of medical treatment foster the apperence of dizziness in elderly [16].

As regards the gender of the subjects, there was a prevalence of females, 42 subjects (70 %) of the total sample, which is in agreement with other literature which reported a female predominance of BPPV [18,17]. According to Guzmán et al. [19], these findings are attributed to hormonal changes that occurs in women. In this study all cases were

unilateral (100%), matching results reported by Ganaça et al. [20], which reported a unilateral involvement in 88.2% of the study group. As regards the affected side of the involved canals, the authors found that 37 (61.67 %) of the total subjects had left-side posterior canals. This was in agreement with André et al. [17], who reported the prevalence of the left side (60 % of the sample). However it was contrary to the findings from Dorigueto et al. [21], who reported the equal affection of both sides.

Characters of BPPV	Group I	Group II	Type of statistical test	P
Duration in months, mean +/- SD	13.5 +/- 4	11.2 +/- 3	Kruskal-Wallis	0.54
Intensity N (%)				
Mild	9 (30%)	10 (33.33%)		
Moderate	15 (50%)	16 (53.33%)		
Disabling	6 (20%)	4 (13.33%)		
History of recurrence after one week N (%)	3 (10%)	12 (40%)	Chi Square	0.007**
History of recurrence after one month N (%)	1 (3.33%)	7 (23.33%)	Chi Square	0.023*
History of recurrence after 3 months N (%)	1 (3.33%)	6 (20%)	Chi Square	0.044*

Table 1: Characters of BPPV in the two groups, *There was a statistically significant difference in recurrence rate between the two groups on follow-up [13].

As the two groups were similar in several factors including (age, gender, affected ear, duration and intensity of BPPV) and the symptom assessment during managment, the outcome at the follow-up would be expected to be affected only by the post-manuever collar use or not. There was a statistically significant difference between the two groups as regards the recurrence rate and outcome with follow-up (Table 1). We suggest that the use of the collar with restriction of the head movement would facilitate the absorption or adherence of the otoliths to the utricle and decrease the chance for recurrence.

This agree with Froehling et al. [22] who recommend the use of neck collar to avoid the incorrect shifting of the otoliths or its debris after the manuever, since the period without head movement would facilitate the absorption or adherence of the otoliths to the utricle.

However, several studies have reported that the use of collar to maintain head restriction after repositioning manuevers of BBBPV is unnecessary to improve outcome of treatment [13,23]. Unfortunately, these studies either did not use a control group as our study [13] or did not define the actual differences between their experimental group and control group [23,24].

Conclusion

We concluded that the use of collar fixation after canalith repositioning manuever is necessary to improve outcome and decrease the chance of recurrence on posterior canal BPPV patients.

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