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## Maneuvers in BPPV.

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### ABSTRACT

A prospective comparative study of particle repositioning maneuvers [PRM] in the management of benign paroxysmal positional Vertigo [BPPV] was done in 40 patients. Patient was divided into two groups of 20 each. Group 1 was treated with Epley's maneuver and Group 2 with Semont's maneuver. Group 1 showed complete resolution of symptoms in 90% with single treatment session and 100% with two sessions. In Group 2, 85% of patients showed complete resolution of symptoms with single treatment session and 90% with two sessions. The study was conducted in the ENT department of Sree Balaji Medical College & Hospital, Chennai, Tamilnadu, India between December 2011 and December 2012 .

**Keywords:** Benign Paroxysmal Positional Vertigo, Particle repositioning maneuver, Epley's maneuver, Semont's maneuver

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## INTRODUCTION

Benign Paroxysmal Positional Vertigo [BPPV] is one of the most common peripheral vestibular disorders. The classic symptom is that of violent vertigo, occurring within a few seconds of change of position. Most commonly a brief sensation of spinning is experienced on rolling over in bed at night or after arising in the morning. Vertigo may also occur on looking up or down. Vertigo is accompanied by nausea and characteristic nystagmus, which can also be elicited by Dix-Hallpike test. In a study done at University of Crete School of Medicine, Greece, the incidence of BPPV is 107 cases per 100,000 populations per year[1]. BPPV was first described by Robert Barany 1921 [2]. Since that time, several modalities of treatment were tried. Amongst these modalities of treatment the milestones were 'The particle repositioning maneuvers'. These maneuvers are inexpensive, non-invasive and easily administered on outpatient basis and have been proved to significantly relieve the symptoms of BPPV. This study for evaluation of the efficacy of two commonly performed particle repositioning maneuvers namely the 'Epley's maneuver and 'Semont's maneuver has been undertaken.

## MATERIALS AND METHODS

A Prospective study was conducted on forty patients of BPPV, who visited the ENT department of Sree Balaji Medical College & Hospital, Chennai, Tamilnadu, India between December 2010 to December 2011. Forty patients were evaluated with vertigo questionnaire and clinical examination, which included otological, neurological and vestibular function tests. Pure tone audiometry was done for all the patients. Cold Caloric test and imaging of the brain was done in the required patients. The diagnosis of BPPV was based on the clinical history and positive Dix Hallpike maneuver. Patients reacting positively to Dix Hallpike maneuver were included in the study. Forty patients of BPPV were randomly divided into two groups of twenty each. Group 1 was treated with Epley's maneuver and Group 2 was treated with Semont's Liberatory maneuver. After the maneuver the patients were advised to maintain a head up position for 48 hours and to avoid violent head movements.

Follow up Patients were after 2 weeks, 4 weeks and 3 months from the day of maneuver procedure.

The degree of improvement was graded as:

Grade I: Complete relief (No symptoms of BPPV).

Grade II: Partial relief (Occasional vertigo on quick head movements).

Grade III: No improvement after 3- 4 months.

Patients with grade III were treated with repeat maneuver.

## Observations

Forty patients of BPPV were included in the study, 20 males and 20 females. The age range of the patients was between 16 to 60 years. Most patients were in the age group of 40 to 60 years (47.5%). Group 1 was treated with Epley's maneuver. 8 (40%) of them were males and 12 (60%) were females. Group 2 was treated with Semont's Liberatory maneuver. It included 12 (60%) males and 8 (40%) females. Table 1 shows the grades of improvement of patients treated with Epley's maneuver during each follow up. In the first follow up 35% had Grade I improvement, 55% had Grade 2 and 10 % had Grade III improvement. In the second follow up 90% had Grade I improvement, 10% had Grade 2 improvement. In the third follow up all the patients had Grade I improvement. Chi square test was applied to note the statistical significance in grades of improvement between the follow ups. It was found to be significant [  $p < 0.05$  ], i.e. the patients improved significantly from follow up I to follow up II and then towards follow up III

**RESULTS**

**Table 1: Follow Up Vs Grades of Improvement in Group 1**

EPLEY'S N=20	I Follow up	II Follow up	III Follow up
Grade I	35 %(7)	90%( 18 )	100%( 20 )
Grade II	55%(11)	10%(2 )	0%
Grade III	10%(2)	0%	0%

Chi square test was applied to note the statistical significance in grades of improvement between the follow ups. It was found to be significant [p < 0.05], i.e. the patients improved significantly from follow up I to follow up II and then towards follow up III.

**Table 2: Shows the grades of improvement of patients treated with Semont's maneuver during each follow up.**

EPLEY'S N=20	I Follow up	II Follow up	III Follow up
Grade I	30 %(6)	90%( 18 )	90%( 18 )
Grade II	55%(11)	0%	0%
Grade III	15%(3)	10%(2 )	10%(2 )

In the first follow up 30% had Grade I improvement, 55% had Grade 2 and 15 % had Grade III improvement. In the second follow up 90% had Grade I improvement, 10% had Grade 3 improvement. The results at follow up III were same as that of follow up II. Chi square test was applied to note the statistical significance [p < 0.05] in grades of improvement between the follow ups. It was found to be significant i.e. the patients improved significantly at from follow up I to follow up II.

**Comparison of Results of the Two Groups**

Chi square test was used to analyze the various results of the two groups. During follow up I, In Group 1, 35% of patients showed Grade I improvement in comparison to 30% of Group 2.

Equal number patients (55%) had Grade II improvement in both the groups. 15% patients of Group 2 had Grade III results in comparison to 10 % of Group 1. Chi square test showed a significant difference between the two groups at [ p<0.05] proving Epley's Maneuver better than Semont's Maneuver at first followup. In follow up II both the groups had 90% of Grade I improvement. 10% of the Group1 and Group 2 patients had Grade II and Grade III results respectively. There was no significant difference found between the two groups at follow up II. During the follow up III, Group 1 showed 100% of grade I improvement that is all the patients had complete resolution of symptoms. Group 2 showed 90% of grade 1 improvement. 10 % of Group 2 had no improvement. Analysis showed no significant difference, stating Epley's maneuver is no better than Semont's at the last follow up. In Group 1, 90% of patients had improvement with single session. 10% had no improvement at first follow up and were treated with two sessions. They showed complete resolution of symptoms at last follow up. In Group 2, 85% had improvement with single session, 5 % required a second session following which they had improvement. 10 % of patients in this group had no improvement with two sessions. Therefore at the end of three months, Group 1 had complete resolution of symptoms in all the patients with one to two treatment sessions. In Group 2, 90% of the patients had full resolution of symptoms with one to two treatment sessions. 10% of this group had no improvement in symptoms of BPPV. Analysis done using chi square test showed no significant difference in the grades of improvement and number of treatment maneuvers required between the two groups. This shows that both the maneuvers are equally effective in the management of BPPV.

**DISCUSSION**

BPPV is a common peripheral vestibular disease causing vertigo. Historically the treatment of BPPV has had a long journey from benign neglect in the first half of century to aggressive surgical interventions like singular neurectomy, vestibular neurectomy and posterior semicircular occlusion in the later half of the

century. The evolution of various particle-repositioning maneuvers in the eighties has changed the fate of BPPV patients, recently.

Results were compared with previous studies. Ronald Lief Steenerson, Gaye.W.Cronin, Peggy M. Marbach conducted a retrospective study in which 607 patients were treated with Epley's maneuver and 233 patients with Semont's maneuver [3]. Amongst patients treated with Epley's maneuver 67% patients were symptom free, 27% were significantly improved, and 6% had no change in their symptoms. In patients treated with Semont's maneuver 62% patients were symptom free, 36% were significantly improved, and 2% had no change in their symptoms. The mean number of treatment sessions for the group treated with Epley's maneuver was 2.98, with a range of 1 to 12. The mean number of treatment sessions for the group treated with Semont's maneuver was 4.34 with a range of 1 to 19.4. In our study the mean number of treatment sessions for the patients treated with Epley's maneuver was 1.1 with a range of 1 to 2. The mean number of treatment sessions for the group treated with Semont's maneuver was 1.5, with a range of 1 to 2. 10% of the patients of group 2 had no change in their symptoms. P. Jose, V. Rupa, A. Job of Christian medical college & Hospital, Vellore conducted a study which included 51 patients who were treated with Epley's maneuver [4]. Follow ups were done at 4th day, 10th day, 1 month and last review varied between 6-12 months. They found that 58% of patients got relief after single session, 22% after two sessions, 12% after three sessions [4]. In this study 90% had improvement with single session and 10% after two sessions of Epley's maneuver.

Simhadri S, Panda N, Raghunathan M. at Chandigarh conducted one blind prospective study on 40 patients with benign paroxysmal positional vertigo out of which 20 underwent PRM, while the rest received a placebo treatment [5]. After the initial week, 95% showed complete resolution of symptoms with none reporting a recurrence after particle repositioning maneuvers (PRM). Results remained more or less the same at the end of 4 weeks. Three months after PRM, 19 of 20 patients had no vertigo with a meager 5% showing recurrence. [5]. In our study 90% of patients improved at the end of 4th week and 100% patients improved at the end of 3 months.

Levrat, Emmanuel et al conducted a study who included 278 patients [6]. Each patient was treated with a Semont maneuver. More than 90% of patients were cured after a maximum of 4 maneuvers, and 83.5% were cured after only 2 maneuvers. In our study 85% of patients improved with single session and 90% improved after two sessions. Markedly inconsistent success rates have been published for different maneuvers by different authors for the treatment of BPPV. Evaluation of treatment results is complicated by a high spontaneous recovery rate, usually within weeks to months. Epley's original study of the CRP to treat BPPV demonstrated a 97.7% to 100% success rate [7]. Epley has stated in his original study that a less than optimum technique may affect the outcome of the procedure [7]. An explanation for the wide range of reported results, is that the potentially significant deviation of techniques used by each investigator in some critical maneuver, from the original. The method of patient positioning and movement, the use of mastoid vibration, the post procedure instructions that is keeping the head upright, using a cervical collar.

Another area of inconsistency between studies involves the use of repeat maneuvers. Epley recommended use of repeat maneuvers, as was used in this study [7]. Differences in the reported success of repositioning may also be due to differences in the classification system used to define success and failure. Semont reported 92.68% improvement after two maneuvers [8]. Many authors have relied primarily on the patient's self report on symptoms. However subsequent studies by various authors revealed a wide range of response rates.

Many others have the opinion that negative Dix Hallpike test is gold standard for success in treatment of BPPV. The Dix Hallpike test is diagnostic for BPPV when the classic response is obtained. However the overall sensitivity of the test is less clear. For example the intensity of nystagmus and vertigo induced by the Dix Hallpike test may vary from day to day and can be affected by performance factors such as the speed and plane of the head movement during the test. Not all the authors relied solely on the results of Dix Hallpike test to define success and failure. Instead most authors assessed outcomes on the basis of some combination of subjective report of symptoms and the Dix Hallpike test result when available [9].

The natural history of BPPV is incompletely understood. Although spontaneous resolutions of symptoms is common, it is also clear that some patients have frequent recurrences. It is not known whether repositioning maneuvers alters the natural history of recurrences of BPPV.



### CONCLUSION

BPPV is a curable disorder with simple particle repositioning maneuvers. Effective treatment can be given with these maneuvers on an out patient basis. Both Epley's maneuver and Semont's maneuver are efficient in the management of symptoms of BPPV, with no significant statistical difference.

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