

## “Efficacy of Particle Repositioning Manoeuvre in Benign Paroxysmal Positional Vertigo”

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### ABSTRACT

Vertigo is a hallucination of movement and is very disabling and sometimes terrifying for the sufferer. BPPV is the commonest cause for vertigo. Fortunately BPPV is easy to diagnose in the clinic by eliciting a proper history and by simple testing. It is also easily treatable by particle repositioning manoeuvres. This posted paper discusses the diagnosis and treatment of BPPV and the results of treatment.

**Keywords:** Particle repositioning manoeuvre, BPPV, Rehabilitation exercise, Semicircular canal.

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### I. INTRODUCTION

There is nothing more gratifying for a physician than Managing a disorder that is for the most part easily diagnosed, and more important, simply and effectively treated using noninvasive means.

Benign paroxysmal positional vertigo the most common affection of the vestibular labyrinth, is one such disorder, it is commonly associated with head trauma, inner ear disease such as meniere's disease or vestibular neuronitis. The Pathophysiological finding in BPPV is calcium carbonate (otoconia) deposits on the cupula of the posterior semicircular canal (cupulolithiasis) or free floating otoconia (canalolithiasis) within the endolymph. Generally BPPV is a self-limiting disorder that can resolve spontaneously due to the ability of the endolymph to dissolve otoconia. Traditionally, fatiguing vestibular rehabilitating exercises were given to patients with persistent BPPV. Introduction of the Canalith Repositioning procedure (CRP) or particle repositioning manoeuvre (PRM) by Semont and Epley has revolutionized the management of BPPV to the point that most physicians, paramedical health care providers and even self-treated patients have used these manoeuvre.

Our study is conducted with 50 patients to prove the efficacy of particle repositioning manoeuvres in the treatment of BPPV.

### II. MATERIALS AND METHODS:

A prospective study was conducted from July 2016 to Jan 2017. Study comprising of 50 patients in giddiness for evaluation.

### Inclusion Criteria:

1. Age group 18 to 60 years
2. Clinical evidence suggestive of positional vertigo –BPPV

### Exclusion criteria:

1. Age more than 60 years and less than 18 years
2. Patients on labyrinthine sedative
3. Bilateral BPPV
4. Multicanal pathology
5. Patients with acute illness / hypoglycemia / neck problem like cervical spondylosis
6. Patients with other causes of vertigo

Patients who presented with giddiness were selected with detailed questionnaire regarding history and were meticulously assessed about the onset, duration and position at which patient develops vertigo and they were subjected to otological examination, tuning fork test, pure tone audiometry.

All patients were subjected to vestibular function test like Romberg's test, tandem walking, Fukuda's stepping test and caloric test to confirm peripheral vertigo. Adjuvent supports like mastoid oscillation Frenzel's glass, Dizzy fix (is dynamic visual device which is used to complete the manoeuvre in proper way) were not utilized.

Dix Hallpike positional test, head roll tests were done as per the clinical guidance, Eye movements were directly visualized without the aid of defocussing lenses. If the direction of nystagmus reversed during the manoeuvre the procedure was halted and repeated. The treatment efficiency was evaluated by obtaining subjective relief of the patient

which was graded (1 to III). This was noticed by the patient in his diary for two weeks when it is relieved completely.

The diagnosis of posterior semicircular canal BPPV was confirmed by observation of up beating torsional nystagmus, when the head was moved in the plane of the posterior semicircular canal, Anterior semicircular canal BPPV was identified by a downbeating torsional nystagmus and horizontal canal BPPV by a direction changing horizontal nystagmus after brisk horizontal head movements.

The presence of latency and a crescendo decrescendo pattern of the nystagmus were mandatory for the diagnosis. The details of nystagmus were critically assessed and the side and exact canal of involvement were identified and

according to canal involvement, therapeutic maneuvers like Epley's, Semont's procedure were done as an office procedure and outcome (vertigo) was graded based on severity of symptoms and signs. Forced position manoeuvre was advised for lateral canal and during follow up also, outcome (vertigo) were graded after the manoeuvre at 4<sup>th</sup> day, 10<sup>th</sup> day, 1 month and 6 months.

Position test was done and patients were classified into 3 types. Those patient who are not resolved the manoeuvre like Semont's or Epley's repeated. Patient was followed for a 2 weeks.

For the patients those who are grade III were advised to undergo investigation like special audiological test, CT scan and MRI to rule out other causes.

#### Grading of Giddiness

|         |                           |
|---------|---------------------------|
| Grade 0 | No giddiness              |
| Grade 1 | Walks without support     |
| Grade 2 | Walks with support        |
| Grade 3 | Unable to get up from bed |

#### Grading of Dix Hallpike's test

|         |                                  |
|---------|----------------------------------|
| Grade 0 | without nystagmus and giddiness  |
| Grade 1 | with giddiness without nystagmus |
| Grade 2 | with nystagmus and giddiness     |

#### Provisional Diagnosis: BPPV

Right PSCC / Right ASCC / Right LSCC / Left PSCC / Left ASCC / Left LSCC

#### Particle Repositioning Manoeuvre details:

\* Type of procedure performed

- \* Date of first procedure
- \* Post procedure subjective symptomatic benefit grade: 1, 2, 3
- \* Date of second procedure
- \* Date of third procedure

#### Follow Up

| Follow Up           | 4 <sup>th</sup> Day | 10 <sup>th</sup> Day | 1 Month | 6 Months |
|---------------------|---------------------|----------------------|---------|----------|
| Symptoms (Grade)    | 123                 | 123                  | 123     | 123      |
| Dix hallpike (Type) | 123                 | 123                  | 123     | 123      |

### III. RESULT AND ANALYSIS

#### Demographic details:

Fifty patients were included in the study females 31 (62%), Males were 19 (38%) Female to Male ratio 1.64:1 All the patients had giddiness and

were found to have a positive Dix-Hallpike/ Supine roll test confirming the clinical diagnosis of BPPV, In five patients (10%) nausea and vomiting were found to be associated.

#### AGE DISTRIBUTION

| Age        | 18 -30Yrs | 31-40Yrs | 41-50Yrs | 51-60Yrs |
|------------|-----------|----------|----------|----------|
| Number     | 11        | 15       | 13       | 11       |
| Percentage | 0.22      | 0.3      | 0.26     | 0.22     |

#### Sex Distribution

| Male | Female |
|------|--------|
| 19   | 31     |

**Side Distribution**

|       |      |
|-------|------|
| Right | Left |
| 33    | 17   |

**Canal Distribution**

|               |             |              |
|---------------|-------------|--------------|
| Posterior SCC | Lateral SCC | Anterior SCC |
| 45            | 4           | 1            |

**Particle Repositioning Manoeuvre**

|       |     |        |                |
|-------|-----|--------|----------------|
| Epley | FPP | Semont | Reversed Epley |
| 43    | 4   | 2      | 1              |

**Subjective Relief Grading**

|                                | 4 <sup>th</sup> day | 10 <sup>th</sup> day | 1 Month   | 6 Months  |
|--------------------------------|---------------------|----------------------|-----------|-----------|
| Group I<br>(No vertigo)        | 45 (90%)            | 47 (94%)             | 49 (95%)  | 50 (100%) |
| Group II<br>(partial response) | 3 (6%)              | 2 (4%)               | 1 (1%)    | -         |
| Group III<br>(No response)     | 2 (4%)              | 1 (1%)               | -         | -         |
|                                | 50 (100%)           | 50 (100%)            | 50 (100%) | 50 (100%) |

**OBJECTIVE RELIEF GRADING**

|                                  | Group I  | Group II   | Group III |
|----------------------------------|----------|------------|-----------|
| Type I<br>No nystagmus           | 45 (90%) | (66.66%)   | -         |
| Type II<br>Partial Nystagmus     | 5 (10%)  | 1 (33.33)% | -         |
| Type III<br>Persistent Nystagmus | -        | -          | 2(100%)   |

**IV. DISCUSSION**

In this study, it was able to clearly demonstrate the effectiveness of various particle repositioning manoeuvre (PRM) in the treatment, of BPPV, with success rate approaching 90% other single session of Epley’s manoeuvre publication, their success is usually ranging from 78-90%, An overlooked important aspect of the BPPV is its impact on the quality of life, daily activity and the dramatic improvement achieved post therapy was addressed and stressed in this study.

**V. SUMMARY**

Patients presenting with giddiness should be carefully screened by detailed questionnaire regarding onset, duration, predisposing factors and associated other problems. After diagnosing posterior canal BPPV Epley’s manoeuvre used primarily at second visit Epley’s or semont’s manoeuvre done. For Horizontal canal BPPV diagnostic manoeuvre is supine roll test and therapeutic manoeuvre forced prolonged position manoeuvre is used. In anterior canal BPPV we had difficulty in diagnosis and treatment After doing appropriate therapeutic manoeuvre, patients were asked to wait for half an hour and given with post manoeuvre instruction.

Patients were followed up on 4<sup>th</sup> day, 10<sup>th</sup> day, one month and sixth month. Even though literature showed 30% recurrence rate at one year in our study we didn’t get any recurrence with in the follow up of six months period. Properly diagnosed and appropriately executed particle repositioning manoeuvre will give maximum benefit to the patients.

**VI. CONCLUSION**

Particle repositioning manoeuvre is found to very effective procedure in the management of isolated BPPV affecting a single semicircular canal.

Since history and clinical examination are the only tools in the diagnosis of BPPV, a proper evaluation will help in careful localization of the semicircular canal affected.

- \* Most commonly occurs is middle aged females, female to male ratio is 1.64:1
- \* Posterior semicircular canal involvement is most common.
- \* Right side predominant to left
- \* It present with episodic vertigo, occurs in particular position and lasting for seconds to minutes.

- \* Elicitation of history and positional test is adequate to diagnosis.
- \* Particle repositioning manoeuvre is effective way to treat and give immediate relief to the patients even though it is a self-limiting disease.

Appropriate particle repositioning manoeuvre when correctly performed will give the maximum expected benefit to the patients.

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