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# Comparative Study of Efficacy of Epley's and Semont's Maneuver in the Treatment of Benign Paroxysmal Positional Vertigo in a Tertiary Hospital

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**Abstract:** ***Aim and Objective: Benign paroxysmal positional vertigo (BPPV) is characterized by brief episodes of paroxysmal vertigo which are provoked by certain changes in the position of the head. We compared Epley's and Semont's maneuver, which are both known treatment methods for BPPV in our hospital. Materials and methods: 60 patients who came with complaints of vertigo to our outpatient department and were diagnosed to have BPPV by Dix Hallpike's test were selected and prospectively divided into two equal groups, and treated with Epley's and Semont's maneuver respectively. We included patients of age 20 and above of both sexes and excluded central or other causes of peripheral vertigo. Data collected was analysed using Statistical product and service solutions (SPSS). Chi square test was applied and statistical significance was set to P ≤ 0.05. Results: In patients treated with Epley's maneuver 86% became asymptomatic after 1 week as compared to 53% in those who underwent Semont's maneuver. However symptomatic relief was similar at the end of 2 weeks in both the maneuvers. Conclusion: On comparing between both these methods, Epley's was found to be more efficient as compared to Semont's maneuver. However Semont's maneuver can be a good alternative as evidenced by comparable relief of symptoms at the end of 2 weeks.***

**Keywords:** Benign paroxysmal positional vertigo, Epley's maneuver, Semont's maneuver, vertigo, BPPV

## 1. Introduction

Benign paroxysmal positional vertigo (BPPV) is one of the most common cause of vertigo which results from displacement of otoconia into semicircular canals[1]. It is characterised by episodes of intense vertigo that lasts for 20-30 seconds that comes with certain head movements [2]. BPPV is usually idiopathic but we have to rule out other causes of BPPV such as vestibular neuritis, Meniere's disease, head injuries, etc. [3] Nausea is commonly associated with BPPV.[4] As the posterior canal is most dependant, it is most likely involved in BPPV. The Dix–Hallpike test is a common test performed to determine whether the posterior semicircular canal is involved or not.[5] This test reorients the head to align the posterior semicircular canal with the direction of gravity and causes vertigo and nystagmus. Both Epley's and Semont's manoeuvre have been used to treat this condition for many years with good outcome.[6] These maneuvers attempt to reposition otoconia back to utricle from posterior semicircular canals.[7]The following are the various positions in each maneuvers we did as part of the study.

Epley's maneuver :
Start with asking patient to sit upright on an examination table, legs should be fully extended.
Position 1: With the head turned 45° to affected side, the patient is made to lie down in head hanging position by 30° extension
Position 2: Head is then turned 90° to the opposite side so that affected ear is up Position 3: The whole body and head are now rotated away from the affected ear to a lateral recumbent position so that the patient looks obliquely downwards
Position 4: Patient is now brought to a sitting position with head still turned to the unaffected side by 45° and head is now turned forward and chin brought down 20°.


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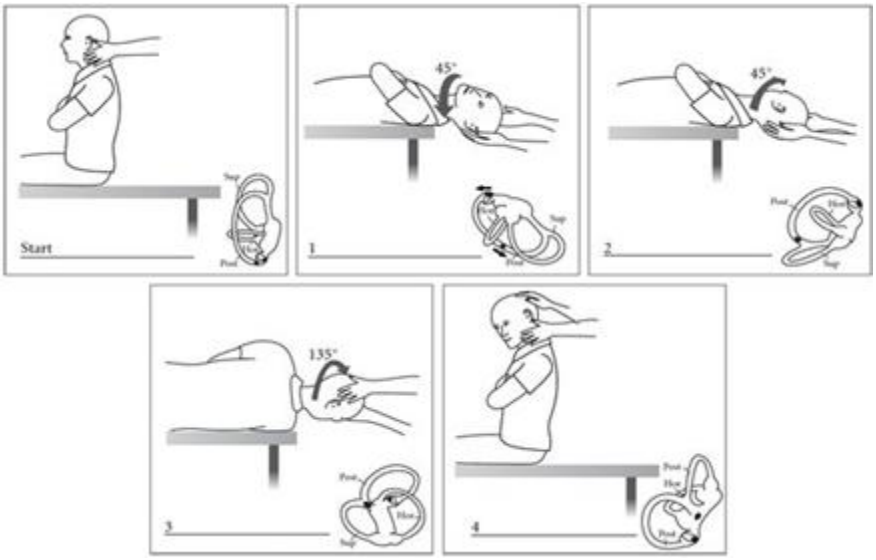


**Figure 1:** Various positions in Epley's maneuver

Reproduced from Benign Paroxysmal Positional Vertigo (BPPV): History, Pathophysiology, Office Treatment and Future Directions. International journal of otolaryngology,2011.[8]

Semont's maneuver :
Position 1:Patient is seated infront of the doctor and made to lie down on the affected side from the seated position, with the face turned upwards 45° away from the affected canal
Position 2: The patient is then quickly swung through the sitting position without pausing to the opposite side
Position 3: The head position of the patient relative to the shoulder should remain unchanged and maintained for 30 seconds.
Position 4: The patient should slowly resumes the sitting position


**Figure 2:** Various positions in Semont's maneuver

Reproduced from Benign Paroxysmal Positional Vertigo (BPPV): History, Pathophysiology, Office Treatment and Future Directions. International journal of otolaryngology,2011.[8]

**Aim of the study**
This study aims to compare the efficacy of Epley's maneuver and Semont's maneuver in the management of BPPV.

## 2. Materials and Methods

This was an observational analytic longitudinal study conducted in the outpatient department of otolaryngology and head and neck surgery of our hospital. The study was done between May and June 2021. Patients of age above 20 years were selected which include both the sexes. Patients who come with symptoms of BPPV were subjected to Dix Hallpike's test and geotropic nystagmus was observed after a latency of about 20 seconds. Frenzel's glasses were used to observe nystagmus. [9] We excluded patients with cervical spondylitis or any spinal injuries. All patients with central causes of vertigo and other peripheral or mixed causes of vertigo such as vestibular neuritis, Meniere's disease, labyrinthitis, etc, were also excluded from the study.

A total of 60 patients who visited our outpatient department were selected for the study and were explained about the study in their local language and informed consent was obtained. They were divided into two equal groups. Those patients treated with Epley's maneuver in group A and those patients treated with Semont's maneuver in group B. Post maneuver treatment all patients were advised postural restriction for 48 hours.

All patients were followed up twice 1 week apart for any symptoms of BBPV after the start of the study. They were subjected to the Dix Hallpike's test to confirm the results. All the patients were followed up for a total of 2 weeks after an initial visit.

## 3. Observations and Results

**Age Distribution**
The age of patients in this study was from 21 years to 76 years. Mean age was 49 years. Maximum patients belonged to 51 to 60-year age group.


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**Table 1:** Age distribution in patients

| Age (in years) | Number of Patients | Percentage |
|---|---|---|
| 21-30 | 1 | 1.6 |
| 31-40 | 6 | 10 |
| 41-50 | 18 | 30 |
| 51-60 | 25 | 41.6 |
| 61-70 | 8 | 13.3 |
| 71-80 | 2 | 3.3 |

**Sex Distribution**

In this study, out of the 60 patients 33 (54%) were females and 27 (46%) were males.

**Clinical Presentation**

Majority of patients (78 percent) came with typical history of vertigo while change in position of head and around 46 percent of patients also complained of nausea.

**Table 2:** Clinical presentation in patients

| Presenting complaints | Number of patients | Percentage |
|---|---|---|
| Vertigo with change in the position of the head | 47 | 78 |
| Imbalance and dizziness | 12 | 20 |
| Nausea | 28 | 46 |

Group A- Patients treated with Epley's maneuver

A total of 30 patients were treated with Epley's maneuver. Out of this 27 patients had improvement in symptoms of positional vertigo and nausea after 1 week. Dix Hallpike's test was performed and 26 patients were negative. They were followed up for one more week. No patient had any relapse. However, 6 patients still remained Dix Hallpikes positive and 3 patients still complained of symptoms of vertigo.

Group B- Patients treated with Semont's maneuver

A total of 30 patients were treated with Semont's maneuver. Out of this 18 patients had improvement in symptoms of positional vertigo and nausea after 1 week. Dix Hallpike's test was performed and 16 patients were negative. They were followed up for one more week. No patient had any relapse. However, 10 patients still remained Dix Hallpikes positive and 6 patients still complained of symptoms of vertigo.

**Table 3:** Dix Hallpike's test after one week

| Maneuver performed | Negative | Positive |
|---|---|---|
| Epley's | 26 | 4 |
| Semont's | 16 | 14 |

The chi-square statistic is 7.9365. The p-value is . 004845. Significant at p<.05.

**Table 4:** Dix Hallpike's test at the end of two weeks

| Maneuver performed | Negative | Positive |
|---|---|---|
| Epley's | 27 | 3 |
| Semont's | 20 | 10 |

The chi-square statistic is 4.8118. The p-value is .028266. Significant at p < .05.

**Table 5:** Subjective complaints of vertigo after one week

| Maneuver performed | Complete Resolution | Improvement | No improvement |
|---|---|---|---|
| Epley's | 23 | 04 | 03 |
| Semonts's | 16 | 02 | 12 |

The chi-square statistic is 7.3231. The p-value is .025693. Significant at p < .05.

**Table 6:** Subjective complaints of vertigo at the end of two weeks

| Maneuver performed | Complete Resolution | Improvement | No improvement |
|---|---|---|---|
| Epley's | 24 | 3 | 3 |
| Semonts's | 18 | 6 | 6 |

The chi-square statistic is 2.8571. The p-value is .239651. The result is not significant at p < .05.

Above tables show that there was a significance(p<.05) between Epleys's and Semont's maneuver on Dix Hallpike's test both after one week and end of 2 weeks . Epley's maneuver gave better results. In patients treated with Epley's maneuver 86% became Dix Hallpike negative after 1 week as compared to 53% in those who underwent Semont's maneuver. Subjective response of vertigo also improved more in patients treated with Epley's maneuver after 1 week. However, no significant difference between Epley's and Semont's maneuvers was noted in symptomatic relief of vertigo at the end of 2 weeks.

## 4. Discussion

Since vertigo is a common complaint and around 20-30 percent of patients who complain of vertigo have BPPV, numerous studies are done to find the efficacy of treatment maneuvers.

We noted that most of the patients were in the age group between 51 and 60, with mean age of 49 years. The disease is more prevalent in females as seen in the study with 54 % females and 46 % males. Similar studies shows that BPPV is more predominant in females [10].

In this study we found that 86 % of patients who were treated with Epley's maneuver had Dix Hallpike's test negative after 1 week. However only 53 % patients who were treated with Semont's maneuver had Dix Hallpike's test negative after 1 week. However, after 2 weeks that number rose to 66 percent. However, it is still behind Epley's manuever.

Lynn et al.reported a success rate of 89% after a single treatment session with Epley's maneuver. Similar study by Ahmed et al. reported 80% recovery. Our study also showed a similar success rate of 86% [11].

VazGarcia did a similar study involving 175 patients suffering from BPPV and were treated with Semont's maneuver and revealed that after 1 week, 79% of the patients were cured [12]. However, success rate in our study was only 53 %.


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There were studies which directly compared Epley's and Semont's maneuver.

Pospeich did a study comparing symptomatic relief following the use of Semont and Epley maneuvers in 46 patients. In their series, Semont's maneuver was beneficial in 62% patients, while Epley maneuver was beneficial in 73% patients. Thus the study shows statistically similar results between both the maneuvers.[13] However a recent study by Sen K et al showed an 86.7% success rate in Epley's maneuver as compared to 56.7%.[14] This was comparable to results in our study which showed 86 % percent improvement on Epley's maneuver and 53% on Semont's maneuver.

Mazoor Tahir et al conducted a similar study comparing the efficacy of both maneuvers and after 30 days 83.3% patients in Semont's group and 93.3 % in Epley's group became negative on Dix-Hallpike test .[15] This was significantly more success rate than our study.

12 patients had subjectively said of no improvement in vertigo after 1 week of Semont's maneuver. However 6 patients said improvement at the end of 2 weeks. There was no significant change in symptomatic relief of vertigo at the end of 2 weeks. This shows that there is not much difference atleast in symptomatic relief of patients after 2 weeks of treatment with both maneuvers. A study by Souvagni Acharya et al showed that both methods efficient in treating BPPV and Epley's maneuver is relatively more effective than Semont's in terms of remission.[16]

Ajayan P V et al conducted a study with total of 200 patients with BPPV and concluded that both Epley's and Semont"s maneuvers were comparable in efficacy after 3 months of follow up.[17]

## 5. Conclusion

BPPV is one of the most common cause of vertigo. This condition can be diagnosed by Dix Hallpike's test which can be performed in an outpatient department. Geotropic nystagmus is seen with the Frenzel's glasses, which clinches the diagnosis.

Both Epley's and Semont's maneuver are proven effective methods of treatment of this condition. On comparing between both these methods, Epley's as compared to Semont's maneuver was found to be more efficacious statistically on Dix Hallpike's test. At the end of 2 weeks, patients who had underwent either of the maneuvers had statistically similar result in subjective complaints of vertigo. So, Semont's maneuver can be a good alternative to Epley's maneuver. It is important that doctors are encouraged to do these maneuvers in outpatient department for confirmed cases of BPPV.

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**Conflicts of interest**: There are no conflicts of interest

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