



# Epley versus Semont Maneuver in the Treatment of Benign Paroxysmal Positional Vertigo

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## Abstract

**Introduction** Benign paroxysmal positional vertigo (BPPV) is characterized by brief but violent attacks of paroxysmal vertigo provoked by certain positions of the head. This study aimed to compare the outcomes of Epley and Semont maneuvers for the relief of vertigo in posterior semicircular canal BPPV.

**Materials and Methods** This was a prospective comparative study conducted in a tertiary referral hospital over 1 year. Among 70 cases of BPPV, 35 were treated with Epley and 35 with Semont maneuver. Follow-up was done at 1 week, 1 month, and 3 months to assess symptomatic improvement using visual analogue scale.

**Results** Out of 70 patients of BPPV, 62 patients responded very well to the maneuvers and got relief from vertigo. Thirty-two patients (91.4%) in the Epley group and 30 (85.7%) patients in the Semont group had a significant improvement post-therapy and the balance was the same in both groups. At 1 month, there was no significant statistical difference in mean visual analogue score (VAS) score between both groups.

**Conclusion** Majority of cases showed symptomatic improvement with both maneuvers. However, patients treated with Epley maneuver showed earlier relief from vertigo than those treated with the Semont maneuver.

## Keywords

- ▶ BPPV
- ▶ maneuver
- ▶ posterior semicircular canal

## Introduction

Benign paroxysmal positional vertigo (BPPV) is one of the common causes of peripheral vertigo with an estimated lifetime prevalence of 2.4%.<sup>1</sup> It may be associated with a reduced quality of life, falls, and depression. It is also the most rewarding vestibular condition to manage, which is characterized by brief attacks of vertigo associated with nystagmus precipitated by certain changes in the head position.

Posterior semicircular canal (PSC) BPPV has more incidence and prevalence than lateral and anterior semicircular canal BPPV.<sup>2</sup> The introduction of the procedures by Epley and Semont has revolutionized the management of BPPV to the point that most physicians, paramedical health care

providers, and even self-treated patients have used these maneuvers.<sup>3,4</sup> This study was conducted to assess the effectiveness of these maneuvers in the treatment of PSC BPPV.

## Materials and Methods

This non-randomized clinical study was undertaken on 70 patients in 1 year in a tertiary referral hospital after obtaining the necessary clearance from the institutional review board [KIMS/EC/66/2019–20]. Written informed consent was taken from all adult patients with PSC BPPV for the study. All of them underwent the Dix–Hallpike positional test and the diagnosis was confirmed with up beating torsional nystagmus. Cases with bilateral involvement,

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cervical spondylosis or neck injury, central vertigo, multicausal pathology were excluded from the study. Then they were allocated either Epley (35 patients) or the Semont maneuver (35 patients) as office procedure treatment and the outcome was graded based on symptomatic improvement. The treatment efficiency was evaluated by obtaining subjective relief of vertigo and was graded according to the visual analog score (VAS) from 0 to 10. After the maneuver, patient was instructed not to extend the head to the affected side and sleep with head elevated.

For the unresponsive patients, maneuvers were repeated after 1 week. Follow-up was done at the end of 1 week and 1 month. After 1 month, patient data were gathered by monthly telephone interviews to determine whether symptoms of position-induced vertigo had returned.

The data were analyzed with Stata version 14 using Chi square, analysis of variance (ANOVA), and independent *t* tests. A *p*-value less than 0.05 was considered statistically significant.

## Results

In this study, 70 (30 male and 40 female) patients of PSC BPPV were treated with either Epley or Semont maneuver. The study population was aged between 22 and 79 years (►Table 1). The mean age distribution was  $47.8 \pm 13.8$ . The mean age distribution of Epley and Semont groups was found to be 47.9 and 47.7 years, respectively. Right PSC involvement

was observed in 37 (52%) and left in 33 (47%). Two (2.8%) patients had associated headache, and eight (11%) had associated nausea and vomiting along with giddiness. The number of cases that recovered with either procedure from 1 week to 4 weeks is given in ►Table 2. The outcomes after either procedure at the end of 1 week and 1 month are given in ►Table 3. The VAS score analyzed using *t* test, and the change in the scores after treatment is given in ►Table 4.

At the end of first week, 88.57% in the Epley group and 82.85% in the Semont group had relief from vertigo. Out of 70 patients of PSC BPPV, 62 patients (88.57%) responded very well to the maneuvers and got relief from vertigo at the end of 1 month. Two patients had a recurrence of vertigo within the follow-up of 3 months.

## Discussion

Patients with vertiginous symptoms will ultimately be diagnosed with BPPV in 17 to 42% of cases, making BPPV the most frequent cause of vertigo.<sup>5,6</sup> The most widely used maneuver for the treatment of PSC BPPV is that of Epley.<sup>3</sup> This maneuver is a simple, effective way to treat PSC BPPV, the most common variant. Celis-Aguilar et al found this maneuver to be effective even for short-term treatment of BPPV.<sup>7</sup> A few authors opined that in resistant cases and/or cases with suspicion of cupulolithiasis, Semont liberatory maneuver may be used.<sup>4</sup> However, in our study we had more failures with Semont maneuver than with Epley. Cetin et al in their study found similar recovery and recurrence rates for both

**Table 1** Comparison of the age class interval in the groups

Age (y)	No. of cases Epley (%)	No. of cases Semont (%)
< 40	10 (28.6)	11 (31.4)
41–49	10 (28.6)	10 (28.6)
50–59	8 (22.9)	5 (14.3)
> 59	7 (20.0)	9 (25.7)
Total	35 (100)	35 (100)

**Table 2** Duration of vertigo in the patients

Duration	<i>n</i>	%
1 week	30	42.9
2 weeks	20	28.6
3–4 weeks	12	17.0
> 4 weeks	8	11.4
Total	70	100

**Table 3** Improvement of symptoms at the end of first week and first month

Symptoms	End of 1 week		End of 1 month	
	Epley (%)	Semont (%)	Epley (%)	Semont (%)
Improved	31 (88.57)	29 (82.85)	32 (91.4)	30 (85.7)
Not improved	4 (11.43)	6 (17.15)	3 (8.6)	5 (14.3)
Total	35 (100)	35 (100)	35 (100)	35 (100)
<i>p</i> -Value	0.52		0.452	

**Table 4** Change in VAS score with treatment

VAS score	Epley group Mean (SD)	Semont group Mean (SD)	<i>p</i> -Value
At baseline	10 (0)	10 (0)	1
After the treatment	5.1 (1.0)	5.7 (1.5)	0.027
After 1 week	2.7 (1.3)	3.6 (1.9)	0.028
After 1 month	1.5 (1.9)	1.9 (2.6)	0.466

Epley maneuver and Brandt–Daroff exercises.<sup>8</sup> However, Vijayaraj et al found that the Epley maneuver was superior and resulted in a positive impact on the quality of life as compared with Brandt–Daroff exercises.<sup>9</sup> Karanjai et al found healing rates of 87% in the Epley group, 75% in the Semont group, and 56% in the Brandt–Daroff group in a randomized controlled trial.<sup>10</sup> Acharya et al too found that Epley maneuver gave superior results than Semont in terms of remission of symptoms, but the same in preventing relapses.<sup>11</sup> Our study too agrees that Epley maneuver is superior to Semont, even though the difference was not statistically significant. Gupta et al found a significant difference between the procedures and the results revealed that 90, 73.33, and 50% patients improved with Epley, Semont, and Brandt–Daroff groups respectively.<sup>12</sup> Hence they concluded that Epley procedure was the best choice and Semont or Brandt–Daroff should be the least preferred in patients with PSC BPPV.<sup>12</sup> Sen et al too found that the Epley maneuver was more effective than the Semont in a randomized double blind study.<sup>13</sup> Gaur et al in a prospective study concluded that Epley maneuver with medicines was more effective than medicines alone.<sup>14</sup> Akula et al in a study compared Epley maneuver with reassurance among 72 patients and found a success rate of 93.75% and 6.25%, respectively, in the second follow up.<sup>15</sup> All these studies prove the sheer popularity of Epley maneuver due to superior results. Cohen et al in their study concluded that repositioning treatments were likely to be effective as long as the head was moved rapidly enough and through the correct planes in space.<sup>16</sup> Perez-Vazquez et al, in their review, found that more than 90% of patients could be successfully treated with maneuvers that move the particle back to the utricle.<sup>17</sup> Kader et al in their study found success rates of 90%, 85%, and 80% in Epley maneuver, rolling over maneuver and Brandt–Daroff exercises respectively.<sup>18</sup> Toupet et al compared Epley and Semont–Toupet maneuvers in their study and concluded that both had similar efficacy. Post maneuver restrictions did not modify the intensity of vertigo and dizziness in the observation period.<sup>19</sup> In our study too, post maneuver restrictions were similar in both the groups and did not make any difference.

## Conclusion

Epley maneuver was faster and significantly more effective than Semont in relieving the symptoms in PSC BPPV immediately after the maneuver and at the end of 1 week. Patients treated with the Epley maneuver showed earlier relief than patients treated with the Semont maneuver. However, this difference was not statistically significant at the end of 1 week and 1 month.

### Conflict of Interest

None declared.

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