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## EFFECTIVENESS OF EPLEYS MANEUVER IN BPPV: AN OBSERVATIONAL CLINICAL STUDY OF 65 PATIENTS

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**ABSTRACT: BACKGROUND/AIM:** Benign paroxysmal positional vertigo is one of the most frequent peripheral vestibular system disorders characterized with brief attacks of vertigo, with associated nystagmus, precipitated by certain changes in head position with respect to gravity. The majority of patients have posterior SCC BPPV, while about 15 percent have the lateral SCC variant. The superior variant is rare. The aim of this study is to assess the clinical and symptomatic improvement in BPPV patients after performing Epleys maneuver. **MATERIALS AND METHODS:** A one year observational clinical study review was conducted on diagnosed BPPV patients in 65 patients from July 2013 to July 2014. Patients with Dix Hallpike test positive and subsequently an Epleys maneuver performed were selected. Demographic data, clinical history and examination, treatment plan information was collected and analyzed. The patients were followed up at the intervals of 7 and 14 days. The maneuver was repeated if vertigo and nystagmus on control positioning test persisted. The transition from positive into negative Dix Hallpike test after one or two Epley maneuver was considered as success in treatment. **STATISTICAL TESTS:** chi-square test, Fischer test. **RESULTS:** 65 patients were selected randomly with Dix Hallpike positive test and confirmed to have BPPV. According to severity of symptoms and observation on Dix Hallpike test, Epleys maneuver was performed once or twice. 41 patients reported a complete resolution in 1<sup>st</sup> week follow up. 16 patients reported a complete resolution in the 2<sup>nd</sup> week follow up after a repeat Epleys maneuver. 8 patients reported a partial resolution of symptoms after 2<sup>nd</sup> week, were advised for a home exercise of Brandt Daroff exercises was considered as the failure group. This was statistically analysed using chi-square and fisher test. **CONCLUSION:** Epleys maneuver is an effective treatment for BPPV of posterior SCC, with an overall effectiveness quotient of 87.7%. It is effective when, either repeated in one or two sessions, with a single or repeat maneuver at the same sitting. Other studies have shown that repeated treatment may improve the remission rate. The Epleys maneuver performed two times in the same sitting was comparatively more effective with a success rate of 92.4% than performed with a success rate of 86%.

**KEYWORDS:** Epleys maneuver, BPPV, observational study.

**INTRODUCTION:** BPPV is the most common cause of vestibular vertigo accounting for 20-30% of diagnosis in specialized dizziness clinics.<sup>[1,2]</sup> It is characterized by recurrent, brief episodes of severe vertigo and rotary nystagmus, precipitated by specific positions of the head relative to gravity.<sup>[3]</sup> The etiology includes idiopathic (50%), head/labyrinthine trauma, stapes surgery, viral neurolabyrinthitis, CSOM, mastoiditis and vestibular neuronitis.

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## **The specific clinical characteristics of BPPV Include:**

1. Acute onset of vertigo and nystagmus include provocative positioning of the head with the affected ear.
2. Vertigo and nystagmus having a brief latent onset period(1-30 seconds)
3. Vertigo and nystagmus of limited duration(15-30 seconds)
4. Characteristic rotary nystagmus in head hanging position
5. Reversal of nystagmus on upright sitting position of shorter duration
6. Fatigability of the response to Dix Hallpike maneuver with repeated positioning.<sup>[4,5]</sup>

Testing of lateral canal BPPV is done by laying the patient supine and quickly turning the patient's head and body laterally towards the side being tested. A purely horizontal nystagmus occurs that is geotropic (fast component towards the lowermost ear) in the majority of cases, but may be apo geotropic (towards the uppermost ear) in 27% of cases.<sup>[6]</sup>

Treatment for BPPV includes expectant observation(relying on the generally self-limiting natural history of BPPV), physical treatment based on particle reposition maneuvers, medication and operative procedures for intractable cases.<sup>[7,8]</sup> As the theories of cupulolithiasis and canalithiasis emerged, several non-invasive techniques were developed to correct the pathology directly. An earlier method used habituation exercises, the effect was not long lasting.

Studies report favourable results for these repositioning maneuvers, no doubt accounting for their growing popularity. Thus an observational clinical study is performed to assess the efficacy of Epleys maneuver in BPPV as a single treatment or repetitive treatment.

**AIMS AND OBJECTIVES:** The aim of this study is to assess the clinical and symptomatic improvement in BPPV patients after performing canalith repositioning maneuver as a single or repetitive procedure in the same episode or as a weekly follow up.

**SETTING OF STUDY:** The study was conducted in ENT department of Adichunchanagiri hospital, BG Nagara. This is a observational clinical study conducted in 65 patients during the period august 2013 to august 2014.

## **INCLUSION CRITERIA:**

- Diagnosis of BPPV with Dix Hallpike Test.
- Minimum follow up of 2 weeks.

## **EXCLUSION CRITERIA:**

- Children.
- Suggestive meniere's disease.
- Hearing loss.
- Cranial nerve involvement.
- Cerebellar signs if present.

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**TECHNIQUE AND TOOLS:** Patients who satisfied the inclusion criteria of selection were taken as subjects of study.

**A. History:** A complete history was taken with regards to symptoms of BPPV including duration of giddiness, duration of vertigo since onset, relation to head movements, h/o trauma, associated nausea/vomiting, headache, recent history of URTI, cervical pain, ear symptoms like tinnitus, block, pain and decreased hearing, previous episodes and past ear surgeries, past medical illness were enquired to rule out other causes of giddiness.

**B. Clinical examination:** general ENT examination, characteristics of the nystagmus, cranial nerve examination, cerebellar signs, Dix Hallpike test, pure tone audiogram were done.

**C. Diagnosis and Epleys maneuver:** a diagnosis of BPPV was made on clinical history, symptoms and on Dix Hallpike Test. The characteristics of subjective or objective and the involved side was made out on Dix Hallpike test. The Epleys maneuver was performed on the positive side.

The Dix Hallpike was repeated in the same sitting for all patients, symptomatic patients and any nystagmus noted was taken positive and Epleys maneuver was repeated. A follow up was recorded after 1 week and 2 weeks after performing Epleys maneuver. All patients were given standard anti vertigo medications, to take as and when needed only.

The follow up assessment was done by asking every patient to return in 7 days duration. The above protocol was followed. If their symptoms had not resolved completely and Dix Hallpike was positive a repeat cycle of Epleys was performed once or twice as needed. These patients who had a second Epleys maneuver repeated were further asked to report within 7 days. At the end of 2 weeks, those of who reported with persistent vertigo were included in the failure group, and all who had complete recovery of symptoms since the initial visit were includes in the success group.

**STATISTICAL METHODS:** Descriptive and inferential statistical analysis has been carried out in the present study. Results on categorical measurements are presented in number (%).Chi-square/ Fischer test has been used to find the significance of study methods on categorical scale between 2 or more groups:

Suggestive significance-p value:  $0.05 < p < 0.10$

Moderately significant-p value:  $0.01 < p < 0.05$

Strongly significant-p value:  $p < 0.01$

**OBSERVATION AND ANALYSIS:** The age group of patients studied was 23 to 74 years. In the age group 21 to 30 years only 4.6% was reported. In age group 31 to 60 it was about 86%. About 12.3% incidence in age group 61 to 70 years and 6.2% above 71 years is noted.

The median was taken as 46. Females were reported to comprise 60% and males 40% of subjects in the study. Giddiness duration was reported as <30 seconds in 69.2% and >30 seconds in 30.8%.

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Duration of symptoms was <7 days in 73.8%, >7days in 26.2% of subjects. 81.5% of patients could relate the symptoms to head movements, 18.5% could not. Patients reported a right side involvement in 53.8%, left side in 27.7% and 18.5% patients could not identify the side involved.

History of trauma was noted in 12.3% of patients in this study. An association of clinical characteristics was included and nausea vomiting was about 46.2%, headache reported to be as 44.6%, URTI was 13.8% and cervical pain was about 27.7%. 7.7%patients reported of a ear block and ear pain, 16.9% reported to experience a decreased hearing and 20% suffered from tinnitus. All patients with decreased hearing were mostly a case of presbycusis. Medical conditions associated, were also included in the study and 36.9% presented with hypertension, 7.75% of patients had diabetes and 1.5% were noted to have coronary artery disease.

84.6%patients demonstrated a objective test for Dix Hallpike test, and 15.4% were subjective Right side positive was noted in 58.5% and 41.5% was noted on the left side. Patients who required Epleys manuever twice was 23.1% and the rest 76.9% only one time. In the first follow up visit after 1 week 41 patients out of 65, i.e 63.1% reported a complete resolution of symptoms and 36.1% reported a partial resolution of symptoms.

After the 1<sup>st</sup> follow up in 1 week, the Dix Hallpike test was negative in 63.1%, a objective test result was noted in 20% and 16.9% showed a subjective test. In the 1<sup>st</sup> follow up after 1 week, 63.1% did not require a repeat Epleys manuever, 33.8% required a repeat manuever once and 3.1% required the manuever twice. The resolution after a follow up visit in the 2<sup>nd</sup> week was noted as, 24.6% reported to have complete resolution, 12.3% reported partial resolution. For 63.1% this was not applicable as symptoms had completely resolved for these patients within the 1<sup>st</sup> follow up.

The Dix Hallpike test performed in the 2<sup>nd</sup> follow up was negative in 24.6% of patients.7.7% reported a subjective test and 4.6% reported an objective test results. For the 60% it was not applicable as these patients already recovered from vertigo symptoms in the 1<sup>st</sup> visit. During the 2<sup>nd</sup> follow up visit Epleys manuever had to be performed once in 10.8% and twice in 1.5% and 87.6% did not require any manuever as Dix Hallpike test was negative for this group.

Complete resolution of vertigo symptoms in a week's duration were seen in 63.1%. by the end of 2<sup>nd</sup> week a complete resolution was noted in 24.6% patients. There was only partial resolution in 12.3% of patients, at the end of 2<sup>nd</sup> week. The treatment effectiveness after performing Epleys manuever once was 86.2% and 96.4% in patients where the manuever was performed 2 times in the same sitting.

The overall effectiveness of treatment with Epleys manuever at the end of 2<sup>nd</sup> week was 87.7% success rate with complete resolution of symptoms.12.3% was considered as the failure group since only partial resolution was noted at the end of 2 weeks. This group was advised Brandt Daroff exercises.

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RESOLUTION	NO. OF PATIENTS	%
Complete resolution after 1 <sup>st</sup> week	41/65	63.1
*Epleys performed 1 time	28/41	68.3
*Epleys performed 2 times	13/41	31.7
Complete resolution after 2 <sup>nd</sup> week	16/65	24.6
*Epleys performed 1 time	15/16	93.8
*Epleys performed 2 times	1/16	6.3
Partial resolution reported	8/65	12.3

Table 1: Resolution at the end of 1<sup>st</sup> and 2<sup>nd</sup> week

Resolution	No. of patients	Success rates
Complete resolution after single Epleys manuever	43/50	86.2%
Complete resolution after repeat Epleys manuever in same sitting	14/15	96.4%

Table 2: Treatment effectiveness of performing Epleys manuever 1 and 2 times

Treatment effectiveness	No. of patients (n=65)	%
Success rate	57	87.7
Failure rate	8	12.3

Table 3: Over- all success rate of treatment of patients studied (Brandt Daroff exercise advised)

**DISCUSSION:** The Epleys manuever effectively induces a remission from symptoms in most patients. In a recent meta-analysis of several randomized control trials, significantly higher remission rates were demonstrated in patients who were treated with the Epley manuever[9]. Repeated treatments may improve the remission rate.<sup>[10]</sup>

The present study reveals a total success rate of 87.7% at the end of 2 weeks. The manuever performed only once gave a success rate of 86%. In the group of patients in whom the manuever was performed 2 times at the same sitting is proved to be more effective with a remission rate of 92.4%, which is what is shown in previous studies. 12.3% was considered as the failure group and was advised Brandt Daroff exercises.<sup>[11]</sup>

In the present study the median age noted was 46. In the age group 20 to 30 years, 3 patients presented with bppv, which is 4.6%. The p value for the age variable is 0.067, which is significant. In our study 73.3% of patients could describe the duration of giddiness as <30 seconds and 26.3% was not sure about the duration. This was also statistically significant with a p value of 0.095.

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Different positional maneuvers exist for BPPV arising from three scc, however the commonest cause for BPPV is the posterior scc. Bilateral cases exist, for which maneuvers are performed for both sides in separate sessions. A typical nystagmus for posterior canal BPPV, with normal CNS examination, needs no imaging procedures. Successive failures to treatment should prompt imaging.

Observation of any other positional nystagmus, particularly if it lasts for longer than a month, should undergo detailed MRI investigation of the posterior fossa. In the patient with severe, intractable symptoms that do not respond to repeated maneuvers, surgical occlusion of the posterior scc can be highly effective in relieving symptoms.<sup>[12]</sup> Alternatively division of the posterior ampullary nerve, a technically difficult procedure, may be considered.

**CONCLUSION:** Epleys maneuver is an effective treatment for BPPV of posterior scc, with an overall effectiveness quotient of 87.7%. It is effective when, either repeated in one or two sessions, with a single or repeat maneuver at the same sitting. The Epleys maneuver performed two times in the same sitting was comparatively more effective with a success rate of 92.4% than performed once with a success rate of 86%.

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