Epley Maneuver (canalith repositioning) for Benign Positional Vertigo Tareq Azad, MD

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Green (benefits > harms)
Epley maneuver is effective and safe in
resolving symptoms of benign paroxysmal
positional vertigo
1 in 3 were helped (symptoms resolved)
compared to control or sham maneuver
35% higher chance of symptom resolution
compared to control or sham maneuver
No one was harmed (no serious adverse
events reported)
No one was harmed (no serious adverse
events reported)
Complete resolution of symptoms
Serious: None reported
Minor: Nausea, vomiting
273 adult patients with clinical diagnosis of
benign paroxysmal positional vertigo
diagnosed by positive Dix-Hallpike
positional test with clear and classical
features of positional nystagmus.

Narrative

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Benign paroxysmal positional vertigo (BPPV) is one of the most common causes of vertigo, and is thought to be caused by free-floating debris primarily in the posterior semicircular canal.¹ The condition is usually brought on by a rapid change in head position, and diagnosis can be confirmed by a positive Dix-Hallpike test (DHT).² The Epley maneuver was invented as a way to move the ear debris out of the semicircular canal, and involves a series of four sequential movements.³ It should be noted that the first movement of the Epley is the end position of the positive DHT. Other canalith repositioning maneuvers include the Semont, Brandt- Daroff and Gans.

The Cochrane review discussed here examined the effectiveness of the Epley maneuver for posterior canal BPPV.⁴ The primary outcome was complete resolution for vertigo symptoms. The authors also examined adverse events associated with the maneuver.

The systematic review included 11 randomized trials with a total of 745 participants.⁴ Five trials compared the Epley maneuver against a sham maneuver, three against other canalith repositioning maneuvers, and three against a control (no treatment, medication only, or restricted positioning). Here we only report the analysis of the data where Epley maneuver was compared to control or a sham maneuver and where complete resolution of symptoms is reported as the primary outcome (some trials reported conversion of DHT from positive to negative as outcome). Of the five studies meeting these criteria and therefore included in the NNT calculation, all were prospective randomized control trials. Subjects were 18-90 years old, mostly female (74%), and all were diagnosed clinically.

When compared to a control (no maneuver) or a sham maneuver (273 patients total), the Epley increased the likelihood of symptom resolution (odds ratio [OR] 4.4, 95% CI, 2.6 to 7.4; absolute risk difference [ARD]: 35%; Number-needed-to-treat [NNT]: 3). Few studies reported adverse events. However, there were no reported serious complications of the treatments. Nausea was the most commonly reported symptom, which could result in patients not tolerating the maneuver.⁴

Caveats

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The measurement of the primary patient-oriented outcome was resolution of symptoms, particularly vertigo, however this and other symptoms were variably reported, and reported at different durations of follow-up.⁴ While Epley appears to be associated with higher rates of resolution of symptoms of vertigo, the absolute rates of resolution of symptoms was still only 56% compared to the 21% of the control group.

Overall, there was a low risk of bias in all included 11 studies, a reassuring finding. The authors of the systematic review assessed the quality of the included trial by examining sequence generation, allocation concealment, blinding, incomplete outcome data, selective reporting and other sources of bias using the Cochrane "Risk of bias" tool. Specifically for the end point of resolution of symptoms, however, heterogeneity was high (I^2 71%) and number of subjects was low (n=273).⁴ The authors attributed this to recruitment of patients from various settings as well as the different length of symptoms. This rings true, as subjects in 9 of 11 studies were from specialty (dizziness or Ear-Nose-Throat [ENT]) clinics, and suffered ongoing symptoms for weeks. Only 2 trials recruited from a primary care population. These primary care visits are likely more representative of the patients seen in the ED as both are more likely to be visits due to acute symptoms as opposed to specialty clinic visits where patients may be more chronically symptomatic. Both of these primary care trials were conducted in family practice clinics and reported higher rates of symptom improvement in patients undergoing Epley's maneuver at first visit but did not show any significant difference in proportion of symptom-free patients between study and control groups beyond one week of follow up.^{5,6}

Barriers to utilization of Dix-Hallpike testing and canalith repositioning maneuvers by ED physicians are also important to recognize. A recent study⁷ interviewing 50 practicing emergency medicine physicians looked at factors which led to utilization of DHT and Epley maneuvers. They found that prior poor experiences with the technique, such as intolerability of the procedure or worsening of symptoms, along with forgetting how to perform the procedure were common reasons for not performing DHT or Epley. Application of canalith repositioning maneuvers in instances that are unlikely to be beneficial and more likely to cause worsening symptoms, such as vestibular neuritis, have likely also shaped practice patterns in some ED physicians. A recent

article as part of the *Choosing Wisely* campaign gave a recommendation against performing canalith repositioning maneuvers (including the Epley) without a clinical diagnosis of posterior semicircular canal BPPV in the affected ear. Establishing the diagnosis of BPPV specifically cited use of DHT,⁸ again enforcing the importance of familiarity with DHT. Lastly, the fear that attributing symptoms to a benign process such as BPPV would lead to increased rates of missed strokes has been identified as one of the primary reasons why many ED providers do not use DHT and canalith repositioning maneuvers.⁷

Another recent study was a provider-focused randomized trial, set in 6 EDs to study the current practice patterns of ED providers with regards to acutely dizzy patients⁹. This study included 7,635 who presented to the ED with chief complaints of dizziness, vertigo, or imbalance. The intervention group included providers who underwent structured educational sessions reviewing BPPV mechanisms and evidence, video and hands on demonstrations of DHT and canalith repositioning maneuvers, a decision aid and algorithm for the use of DHT and repositioning maneuvers, along with referral resources. The control group were ED providers at these sites without the above-mentioned training. The primary outcome measured was the use and documentation of DHT and repositioning techniques. The main safety outcome was 90-day cumulative incidence of stroke in patients 45 years or older. Adverse events related to DHT and Epley, use of CT head, length of stay, and hospital admission were also measured. The study found an increase in the documentation of DHT and canalith repositioning maneuvers in the intervention group compared to the control group (3.5% vs 1.5%; difference 2.0%, 95% CI 1.3% to 2.7%). Head CTs were performed in the intervention group in 36.7% of visits compared to the control group's 44% of visits (difference -7.3%; 95% CI -5.1% to -9.6%). There was no significant difference in the incidence of stroke in patients aged 45 years or older between the groups. No serious adverse events were identified and minor adverse events in 11.4% of control visits compared to 4.5% of intervention visits, primarily nausea and vomiting. Although the intervention in this study increased the use of DHT and canalith repositioning maneuvers, overall absolute increase rate was still low despite evidence to suggest no difference in the incidence of patients with stroke.

The systematic review discussed here⁴ measures resolution of symptoms as a dichotomous outcome (absent/present) and does not report severity of symptoms. Therefore, the proportion of patients who had improved symptoms but remained symptomatic is neglected. It also must be noted that some patients such as those with cervical spine problems or nausea might not be able to tolerate the maneuver. Lastly, the diagnosis of BPPV is purely clinical and there is no reference standard test for diagnosis.

In summary, based on the results of systematic review discussed here, the Epley maneuver appears to be safe and effective. This treatment is also low cost and can be performed in minutes. Therefore, based on limited data we have assigned a color recommendation of Green (Benefit>Harm), but recognize that larger, methodologically rigorous trials are lacking and could easily impact this balance.

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