

# Central positional vertigo as first initial multiple sclerosis symptom: a case report with systematic review.

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## Abstract

Multiple sclerosis is a disease that affects the central nervous system, resulting in a variety of symptoms such as vision , physical activity and stability .Central positional vertigo as an initial multiple sclerosis symptoms is a rare case in the literature.

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### **Abstract**

Multiple sclerosis is a disease that affects the central nervous system, resulting in a variety of symptoms such as vision , physical activity and stability .Central positional vertigo as an initial multiple sclerosis symptoms is a rare case in the literature which it increases the attention of clinical doctors to follow accurate measurements to diagnosis multi sclerosis regarding the initial symptoms.

### **Keywords**

Central positional vertigo , multiple sclerosis , case report and systematic literature review .

### **Introduction**

Multiple sclerosis (MS) is one of the most common and best-known demyelinating disease with peak incidence between 20 and 30 years of age (1). MS has a wide range of presentation and equal wide range of prognosis. Classically, MS is diagnosed by finding multiple white matter lesion separated by space and time while, the clinical features are defined by the location of lesion. Common clinical features include corticospinal tract signs (weakness and spasticity), sensory abnormalities, and cerebellar dysfunction (intention tremors and ataxia) (2). In patients with MS, equilibrium disorders caused by involvement of brainstem and cerebellar structures are common and about 20% of MS patients representing by true vertigo at some time during the disease. However, peripheral conditions such as benign paroxysmal positional vertigo (BPPV) and central positional vertigo were also reported (3). Therefore, an accurate otoneurologic investigation paying attention to differentiate between central and peripheral cause. Central positional vertigo associated with MS could be easily misdiagnosed as BPPV. It could be difficult if it occurred as the initial MS symptoms to differentiate it from BPPV. The Provoking maneuvers like Dix-hall pike and Supine head roll test results are very crucial in making the diagnosis (4).

In this article we represented a case of central positional vertigo as an initial multiple sclerosis symptoms accompanied with systematic review of previous related cases.

### **Case presentation**

A forty-four years old Female patient with co-morbid illnesses. She was presented two years ago by acute onset severe vertigo lasted for two days. This vertigo was related to position increased in lying on either side associated with nausea and recurrent vomiting and inability to walk. The patient condition was not preceded by viral infection or ear problem. On examination the patient was conscious, alert, oriented to date time and persons. There was first degree bilateral horizontal nystagmus with intact motor, normal planter response, intact sensation and intact cerebellar examination at that time. The ENT examination was normal (no middle ear problems, viral infection or vesicles), but there was positive Dix Hallpike manoeuvre. Patient was admitted combined neurology and ENT for further evaluation and for MRI brain. The MRI brain result showed multiple demyelinating patches corresponding to multiple sclerosis diagnosis (Figure 1a ,1b , 1c). We started her on pulse steroid therapy for five days with marked improvement. We referred her for multiple sclerosis specialized centre where they confirm diagnosis via CSF analysis (oligoclonal bands and IgG index). Patient was started fingolimod 0.5 mg orally once daily.

## Methods

This review is performed and reported according to meta-analysis (PRISMA) guidelines (5).

### Literature search strategy

We systematically searched data bases: PubMed, Scopus, Web of Science and Chochrane. The following search term was used for data base search: (“Benign Paroxysmal Positional Vertigo” OR “Benign positional vertigo” OR “peripheral vertigo” OR “acute vestibular syndrome” OR “acute vestibulopathy” OR “Familial Vestibulopathy” OR “Benign Recurrent Vertigos” OR BPPV) AND (“Multiple sclerosis” OR “disseminated sclerosis” OR MS). Last literature search was done on 27<sup>th</sup>, October 2021.

### Eligibility criteria and study selection

To include studies in our systematic review, they must contain original data about BPPV as first presentation and multiple sclerosis.

And because the data available on his topic is very rare, we decided to include all studies designs including case reports except litter to editor, reviews, and comments. Study screening and study selection were performed by two independent researchers. (Figure 2)

## Results

From 339 studies screened, only four studies met the eligibility criteria for our systematic review. The four studies were case reports with 32 cases as follows: (25, 5, 1, 1),(Frohman 2000, Thomas 2016, Musat 2020, Yoosefinejad 2015) respectively (6-8).

Demographic characteristics and clinical data were extracted as in (Table 1). Age ranges from 31 to 44 years with 19 female cases and 8 male cases. 2 cases were initially diagnosed as BPPV and then found MS was seen on MRI as white patches. In those two cases, Epley and deep head hanging maneuver didn't relieve vertigo but with steroid use in the second case (Musat 2020) was relived. In (Yoosefinejad 2015) the case was initially diagnosed with MS 6 years before developing BPPV which was diagnosed by clinical presentation then they confirmed the diagnoses after Semont and Epley maneuvers used and significantly relieved the BPPV.

## Discussion

Benign paroxysmal positional vertigo (BPPV) is defined as a disease of the inner ear characterized by repeated episodes of positional vertigo. BPPV could be clinically diagnosis by elicitation of nystagmus and vertigo on provoking maneuvers for BPPV (9). Although provoking maneuvers are very useful, minute changes in their findings should raise suspicion of other central causes as it could be easily mixed with central positional vertigo (CPV). CPV can be, CPN is caused by cerebellar and/or brainstem dysfunction and can mimic BPPV (10).

For patients with atypical presentation of BPPV, the physician should consider further investigation with audiometry, vestibular function testing, and neuroimaging.

Atypical BPPV presentation could be: Vertigo that lasts longer than one minute, associated hearing loss, Associated neurological symptoms like gait disturbances or previous history of neurological disorders or tumors. Failure to respond to canalith repositioning maneuvers or vestibular rehabilitation therapy.

### **Case report discussion**

In (Yoosefinejad 2015) they say the patient symptoms were exacerbated by the Dix-Hallpike maneuver and that lead them to make sure that the diagnosis was BPPV but we don't know what they mean by "exacerbation of symptoms" they didn't report the duration, direction, latency of the elicited nystagmus and we can't trust their judgment as central positional vertigo is still not excluded from the diagnosis which means the patient's vertigo could be of central cause, in this case, MS as the patient was previously diagnosed by MS six years before the vertigo onset.

In Must 2020, as in our case, the patient's vertigo was alleviated by the use of steroid therapy. Moreover, deep head hanging maneuver was applied but without any positive result which further suggests the central cause of vertigo and MS was confirmed by MRI.

The cases reported in this review and our case report suggest that central positional vertigo associated with MS could be easily misdiagnosed as BPPV. It may not be that difficult if the case comes with new-onset positional vertigo after initial diagnosis with MS, but on the other hand, if the reverse happens as in our case the final decision of BPPV diagnosis should be carefully taken after ruling out other possible central causes.

The Provoking maneuvers like Dix-hall pike and Supine head roll test results are very crucial in making the diagnosis, minute changes or atypical presentation should raise our suspection to central causes, MRI and CT scans can be good tools to rule out central causes before final BPPV diagnosis decision is taken in this case. After all, we suggest more primary research observational retrospective to and clinical trials should be done to investigate the MS and BPPV association and possible error in diagnosis.

### **Abbreviations**

MS : Multiple sclerosis

BPPV : Benign paroxysmal positional vertigo

ENT : Ears , nose and throat

MRI : Magnetic resonance imaging

CT : Computed tomography

CPV : central positional vertigo

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### **\*Authors' contributions**

All authors have read and approved the manuscript

MM , AS ,AME , AH , WSA , YA , SMK AND SS : Contributed in writing and reviewing the manuscript.

### **\*Ethics approval and consent to participate**

Ethical approval was given by the KING KHALED Hospital. And the patient has given their Parental consent for this publication.

### **\*Consent for publication**

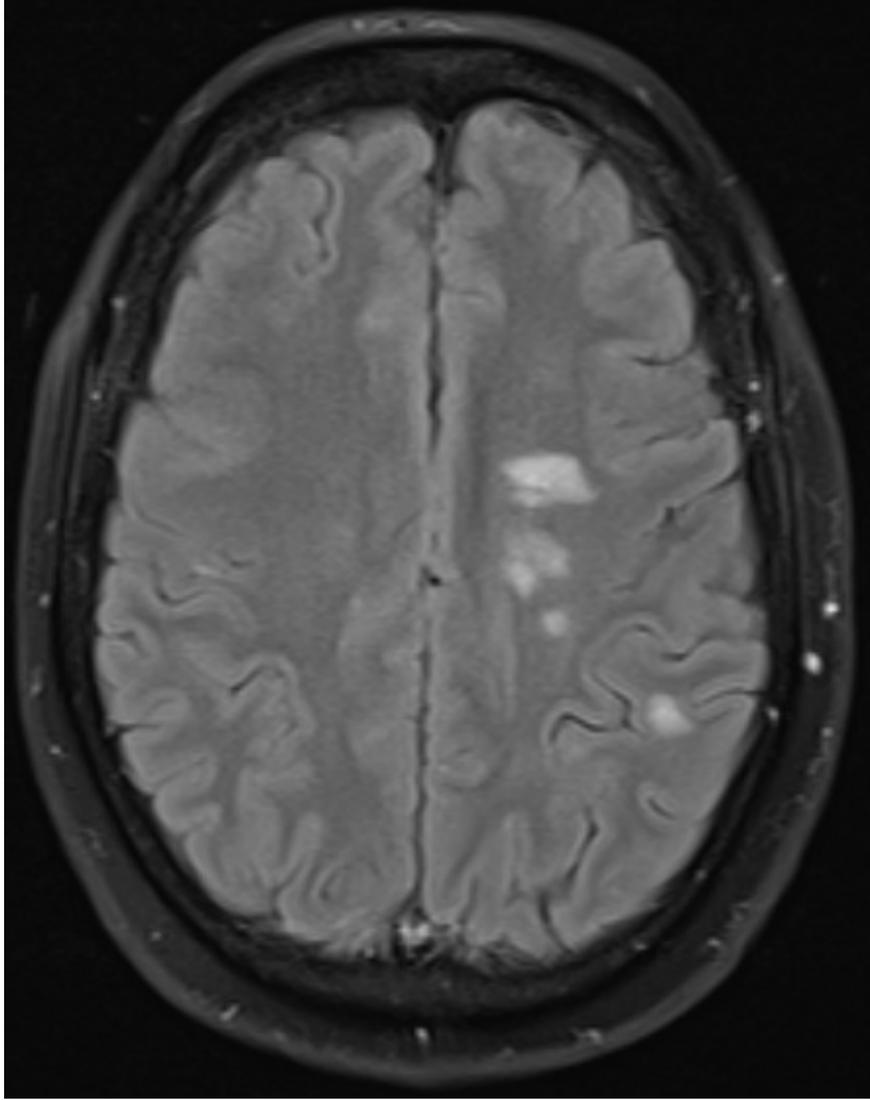
Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor of this journal.

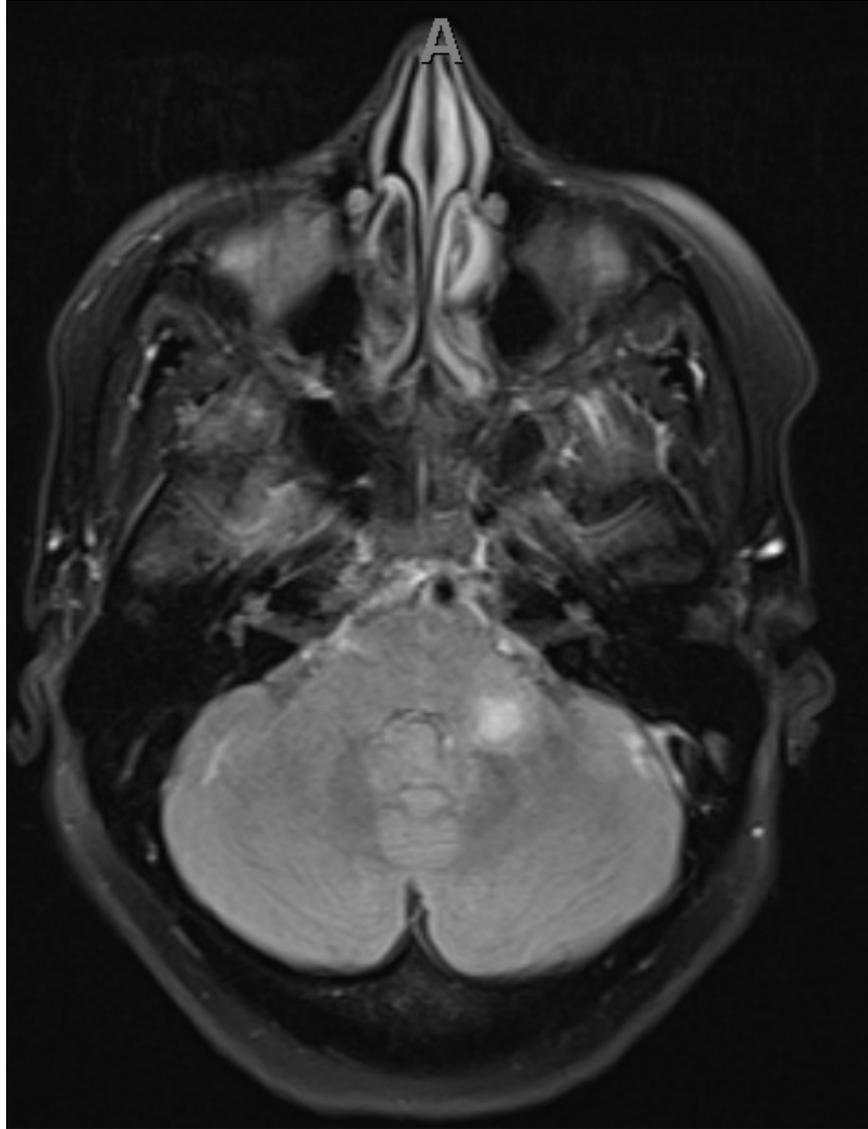
### **DATA AVAILABILITY STATEMENT**

\* All data (of this patient) generated during this study are included in this published article and its supplementary information files.

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