Benign Paroxysmal Positional Vertigo  BSO 2020
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BPPV definition
Vertigo induced by change in head position with respect to gravity associated with nystagmus

Robert Barany
1876-1936
Described BPPV 1921
Nobel Prize 1914
physiology and pathology of vestibular apparatus
Studied with Freud and Politzer
Noted nystagmus after ear syringing

BPPV Diagnosis
Clinical diagnosis based on history and physical findings

BPPV Clinical History
Recurrent rotational vertigo with change in head position (turning in bed, tying shoes)
Short lived
Usually no vomiting
No other otological symptoms
Associated nystagmus
Latent period

Benign Paroxysmal Positional Vertigo (BPPV) Who gets it?
Commoner in elderly
? Degenerative
In younger patients may follow trauma
   Head injury
   Post surgical
Post inflammatory
  Vestibular neuronitis
  Meniere’s
  ? Related to Vitamin D deficiency in some patients

New patients age data
Elderly are often unsteady

BPPV
How common is it?
Up to 25% of all patients in vestibular clinic
? more in primary care
1 per 1000 per year
Women greater than men
Mean age 54 years
95% posterior canal
5% lateral canal

Nature of BPPV at first assessment
Posterior canal 94.5%
Anterior (Superior) canal 0.8%
Horizontal (Lateral) canal 4.7%

Posterior canal side involved
R 53.3%  L 40.8%  Bilat 5.8%

BPPV Natural History
Often spontaneously resolves in weeks or months
Can last years

Dix and Hallpike
1952
Dix Hallpike Test
Check for neck problems
May wish to demonstrate manoeuvre
Do good ear first
BPPV testing
Dix Hallpike

BPPV nystagmus
posterior canal
  Torsional with top of eye beating towards shoulder
  Geotropic
  Also up beating component
  Latency 5 seconds but can be up to 30
  Short lived less than 1 minute
  Fatigable

BPPV diagnosis
  Clinical
  History
  Positional Testing
  Vestibular tests otherwise normal (not required)
  Imaging normal (not required)
  Audiology normal (not required)

BPPV Pathology
Loose crystals from utricle
Canalithiasis
Cupulolithiasis

Nature of otoconia
Calcium carbonate
Approx 10 microns

Otoconia physiology
Otoconia have a very low turnover rate
Degenerate over time by demineralisation
VEMPs decrease with age
Probably do not regenerate after damage
Cupulolithiasis
Harold Schuknecht, Boston 1962

Cupulolithiasis 1973
Basophilic cupular deposits
? Incidental

Posterior canal occlusion
Posterior semicircular canal occlusion for intractable benign paroxysmal positional vertigo.
Parnes LS¹, McClure JA

Canalolithiasis

Free-floating endolymph particles: a new operative finding during posterior semicircular canal occlusion
Parnes LS¹, McClure JA

Posterior canal occlusion
Noted free floating particles

Canalolithiasis

What is the nature of the canal debris
Otoconia and otolithic membrane

Vitamin D levels
Vitamin D is required for otoconial health
Vit D deficiency associated with recurrent BPPV
Seasonal variation of BPPV
Association of benign paroxysmal positional vertigo with vitamin D deficiency: a systematic review and meta-analysis.

Association between serum vitamin D levels and benign paroxysmal positional vertigo: a systematic review and meta-analysis of observational studies.

Patients with BPPV do not have lower Vitamin D levels

Patients with recurrent BPPV do have significantly reduced levels of Vitamin D

After Epley

? Sleep upright for 48 hours
May well be unsteady for a few days
Persistent unsteadiness in the absence of a positive Dix Hallpike test may be the result of persistent utricular dysfunction

Li oscillator
Shaan’s model (Exmoor plastics)
Epley manoeuvre

Dizzy Fix

Semont manoeuvre
  Liberatory manoeuvre
  Right posterior canal
  Right side lying test

Particle repositioning
success rates
Approx 80% after single treatment
  Repeat at 1-2 weeks
  Overall success high 90’s%
  Condition may recur at later date 10+%

Posterior canal BPPV - response to treatment
Success rate 77.2% one Epley, 87.4% two Epley, 92.9% three Epley

Treatment impact on falls in the elderly
Post Epley 64% reduction in falls over 6 months

Lateral (horizontal) canalithiasis
Symptoms similar to posterior canal BPPV
Horizontal nystagmus
Test with patient sitting up 30%
Nystagmus in both head test positions
Affected ear undermost where nystagmus strongest
Treatment for lateral canal
BBQ or Lempert manoeuvre
Gufoani manoeuvre
Forced prolonged position

Lateral (horizontal) canal BPPV repositioning
Treatment failure
More likely to fail if
  Intense vertigo with DH
  Longer duration of nystagmus
  Longer latency
  Previous BPPV

Adverse events
Acute rotatory vertigo 24 hours after treatment (n=1)
Vomited during manoeuvre (n=2)
Conversion to HC (n=4)

Recurrences
Average time between first assessment and recurrence = 7.8 months

Extra information on recurrences
The majority had the same ear affected
Recurrences were generally harder to treat requiring more manoeuvres or additional measures such as home exercises or post therapy instructions
Residual dizziness

May well be unsteady for a few days
Cause of persistent unsteadiness in the absence of a positive Dix Hallpike test is unclear
May be the result of persistent utricular dysfunction
Reduced ocular VEMP
Central adaptation
Small quantity of residual canal debris

Differential diagnosis
Non if classic history and Dix Hallpike findings
Posterior fossa lesion
Migrainous vertigo
Second coexistent pathology

Treatment failures
MRI scan
? Refer for vestibular tests

Surgical Treatments
Posterior canal occlusion
Singular nerve section