

Positional Vertigo Office Diagnosis and Treatment

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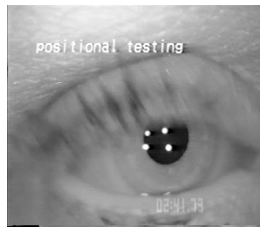
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Benign Paroxysmal Positional Vertigo (a.k.a.)

BPPV
BPV (Benign Positional Vertigo)
Positional Vertigo

Case SH

- 61 y/o wm slipped and fell, hitting back of head
- LOC for 20 min
- In ER, unable to sit up
- Hallpike maneuver -- positive



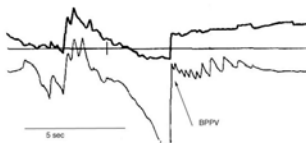
Diagnosis: Dix-Hallpike Maneuver



BPPV nystagmus

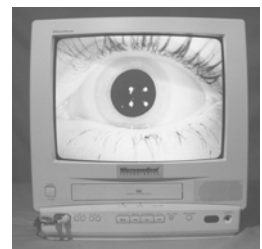


C. Nystagmus of BPPV



- Latency (0-20sec)
- Burst (< 60 sec)
- Upbeating/Torsion vector
- Reversal on sitting
- Fatigue with repetition

Video Frenzel Goggles make it easier



Prevalence of BPPV is high

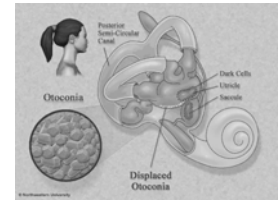
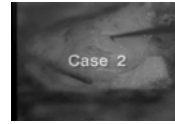
- 20% of all vertigo
- 50% of vertigo in older persons.
- Linear increase with age!
- 85% of all positional vertigo

-Incidence Rates for Benign Positional Vertigo Among Residents of Olmsted County, Minnesota, in 1984

Age (yr)	Patients (no.)			Sex-adjusted incidence/100,000 population per year
	Total	Male	Female	
0-29	12	7	5	25
30-49	11	3	8	42
50-59	11	3	8	141
60-69	7	3	4	118
70-84	10	2	8	193
>85	2	1	1	182
Total	53	19	34	64*

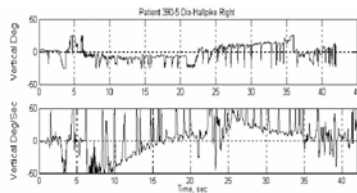
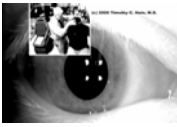
*Age- and sex-adjusted to the 1980 US white population.

BPPV Mechanism canalithiasis (loose rocks)

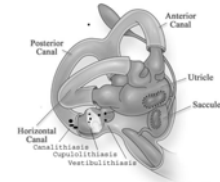
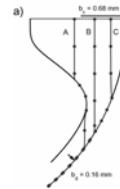


Lauren Parnes – canal plugging

BPPV timing: Latency, burst, reversal, fatigue



Mechanism of Latency and fatigue



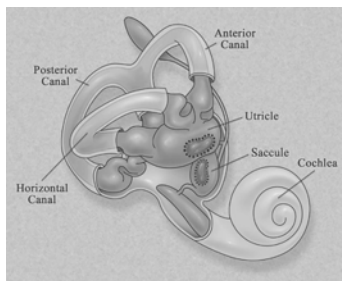
- o Hydrodynamic advantage is less in ampulla
- o Margination -- fatigue

Squires T, Weidman M, Hain T, Stone H. A mathematical model for top-shelf vertigo: the role of sedimenting otoconia in BPPV. J. Biomech. vol. 37, issue 8, pp 1137-1146, 2004

BPPV Variants

Ewald's first law: eye movements occur in the plane of the canal being stimulated. Three canals → three vectors.

- Posterior canal
- Lateral canal
- Anterior canal

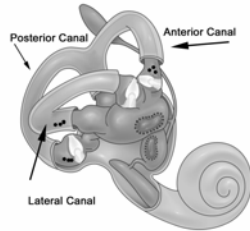


Vector of nystagmus tells you the variant of BPPV (and the treatment)

- PC – Upbeating or Torsion
- AC - Downbeating with/wo Torsion
- LC - Horizontal

PC - BPPV Treatment

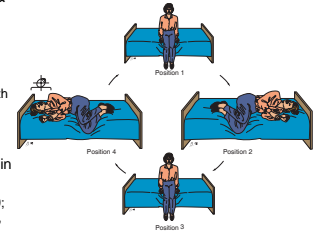
- There are numerous controlled studies of PC BPPV treatment, and they generally show that it works well.
- Goal of therapy is to mechanically remove debris from semicircular canal.



Brandt-Daroff

- Brandt-Daroff exercises (Brandt & Daroff, 1980)

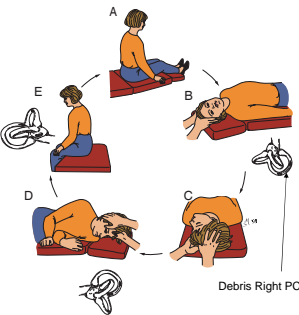
- Historically, first self treatment.
 - 3 cycles of exercise 3 times per day.
 - Stop exercises symptom-free with routine and exercises for 2 consecutive days
- Outcome: 23% success rate within 1 week
 - (Radtke, Neuhauser, et al., 1999; Soto Varela, Bartual Magro et al, 2001).



PC – BPPV Treatment -- CRP

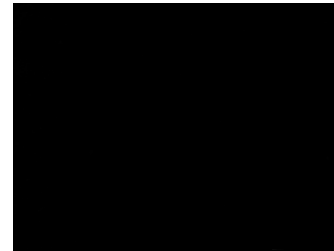
- Canalith Repositioning Procedure (Epley, 1992)**, illustrated for treatment of right PC.

- Single Treatment Approach
- Force of gravity redistributes otoconia
- Outcome: In RCT, 79 ± 16% average short term success rate of single treatment session.
 - (Lynn, Pool et al., 1995; Froehling, Bowen et al, 2000; Soto Varela, Bartual Magro, et al., 2001; von Brevern, Seelig, et al., 2006; Tanimoto, Doi, et al; 2005; Sherman & Massoud, 2001; Sridhar, Panda et al, 2003.)



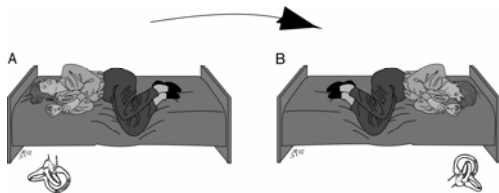
PC – BPPV Treatment -- Epley (CRP)

- Canalith Repositioning Procedure – CRP (Epley, 1992)



PC – BPPV Treatment -- Semont

- Semont Maneuver** (Semont, Freyss, et al., 1988) also referred to as **Liberatory Maneuver**. Illustrated for treatment of right PC.
- Single treatment approach
- Inertia redistributes otoconia
- Outcome: In RCT, 82 ± 6% average short term success rate of single treatment session
 - (Califano, Capparuccia, et al., 2003; Soto Varela, Bartual Magro, et al., 2001; Salvinelli, Casale, et al, 2003; Salvinelli, Trivelli et al, 2004).



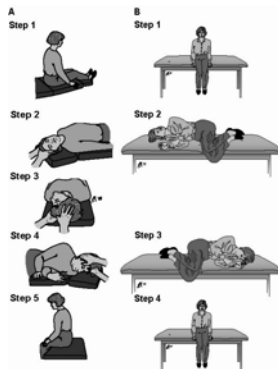
PC – BPPV Treatment -- Semont

- Semont Maneuver (Semont, Freyss et al. 1988)



CRP vs Semont Maneuver

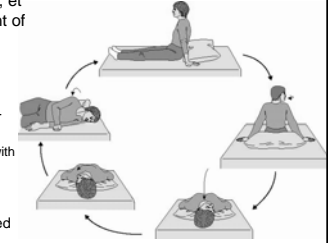
- Efficacy is the same for CRP and Semont Maneuver.
- A comparison of the position of the head during the CRP and Semont Maneuver illustrates that the maneuvers are nearly the same.



PC – BPPV Self Treatment

- **Self-Canalith Repositioning Procedure** (Radtke, Neuhauser, et al., 1999) illustrated for treatment of right PC.

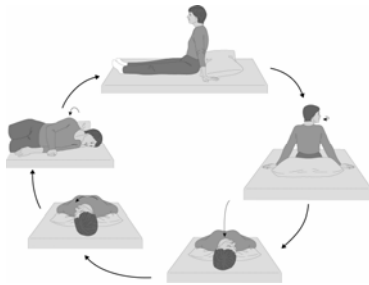
- Self treatment
 - Head is extended over edge of pillow.
 - 3 cycles of exercise 3 times per day.
 - Stop exercises symptom-free with routine and exercises for 2 consecutive days



- Outcome: In RCT, 93 ± 4% cured within 1 week.
 - (Radtke, Von Brevern, et al., 2004; Tanimoto, Doi et al., 2005).

PC – BPPV Self Treatment

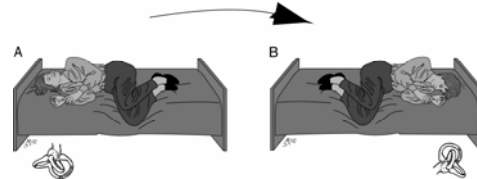
- Modified Canalith Repositioning Procedure (Radtke, Neuhauser, et al., 1999) illustrated for treatment of right PC.



PC – BPPV Self Treatment

- **Semont Maneuver** (Radtke, Von Brevern, et al., 2004) illustrated for treatment of right PC.

- Self treatment
 - 3 cycles of exercise 3 times per day.
 - Stop exercises symptom-free with routine and exercises for 2 consecutive days
- Outcome: 58% success rate within 1 week (Radtke, Von Brevern, et al., 2004).



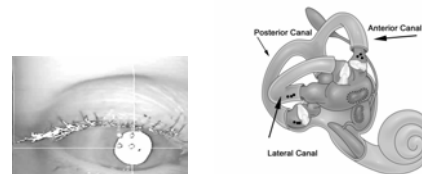
Complications of Procedures

- Canal Conversion
- Nausea and Vomiting
- Recurrence

(Radtke, von Brevern, et al., 2004; Califano, Capparuocia, et al., 2003; Froehling, Bowen, et al., 2000; Soto Varela, Bartual Magro, et al., 2001; von Brevern, Seelig, et al., 2006; Tanimoto, Doi, et al., 2005)

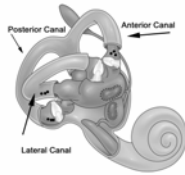
Canal conversion. The “Oh My God” reaction to second cycle of CRP.

- During treatment of PC – BPPV, debris moves from posterior canal to lateral canal (mainly), or anterior canal (rarely).
- Second CRP results in a dramatically different nystagmus
- Treat with maneuvers we will demonstrate later in talk

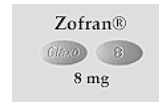


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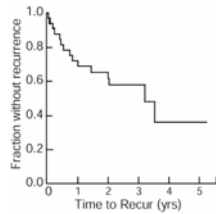
Complications of Procedures 2 -- Emesis



- Nausea and vomiting.
 - Always identify a good sized wastebasket
- High risk patients may be administered antiemetic
 - Ondansetron HCL (Zofran) – if they have to drive home
 - Meclizine (Antivert, Bonine) – if they don't have to drive home
 - Promethazine (Phenergan)

BPPV often Recurs

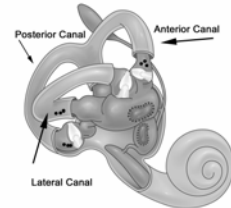
- Of patients treated successfully
 - 25% redevelop BPPV within 1 year
 - 44% redevelop BPPV within 2 years



(Hain, Helminski, et. al., 2000)

Where do the Rocks go ?

- They just dissolve ?
- The dark cells ?



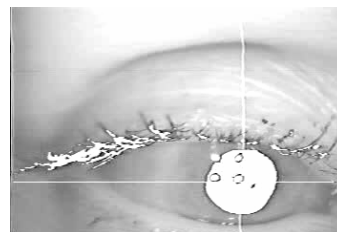
Case: LATERAL CANAL BPPV

- Patient seen in office, has mild PC BPPV
- Sent home with home-Epley instructions
- Calls to say that he is now "much worse"
- Before, just got dizzy lying down on left.
- Now he is dizzy to both sides, and doesn't feel to good standing up either.

Direction Changing Positional Nystagmus (DCPN) is seen in lateral canal BPPV

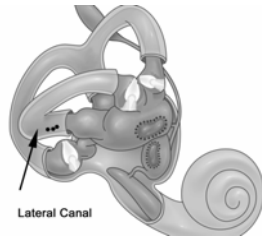
Lateral Canal (5%)

- Horizontal DCPN



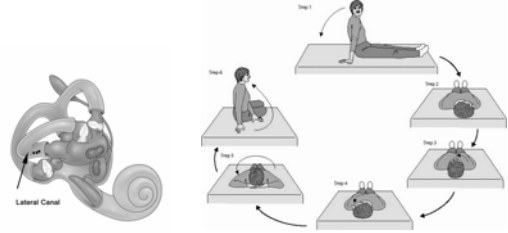
Mechanism:

- Debris deposited in lateral canal
- Can be on either side of loop or stuck to cupula



HC – BPPV Treatment

- **Determine side involved**
- **Treat with Log-roll rolling from bad to good side**
- **Switch to other side if no better**



HC – BPPV Treatment

- There are no controlled studies of HC treatment

- Log Roll - 270° rotation around longitudinal axis at 90° increments in the recumbent position. Illustrated for canalithiasis right HC.
 - Performed by clinician or self treatment.
 - 3 cycles of exercise. If self treatment, 3 times per day.
 - If self treatment, stop exercises when symptom-free with routine and exercises for 2 consecutive days
 - Outcome: 71% cured within 1 treatment (Nuti, et. al., 1998).



Complications of Log Roll

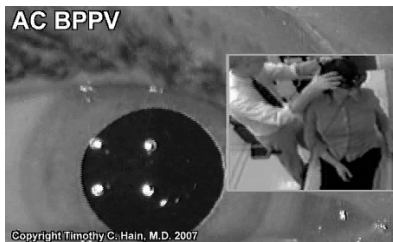


- Nausea and vomiting – lateral canal BPPV seems to cause more nausea – stronger, longer nystagmus
- Doesn't work –
 - You may be treating the wrong side. Switch to other side.
 - You may be treating the wrong disease

Case: ANTERIOR CANAL BPPV

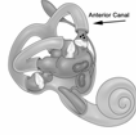
- Patient seen in office, gets dizzy lying on back (any position)
- Dix-Hallpike shows downbeating nystagmus --- not much torsion

Anterior Canal BPPV



Diagnosis of Anterior Canal BPPV

- Downbeating or mixed down/torsional nystagmus
- Provoked by head-hanging
- If no previous BPPV, DD includes DBN in general.



AC – BPPV Treatment

There are no controlled studies

- We use Deep Dix Hallpike
- Logic – wait long enough for debris to sediment past the top of AC.

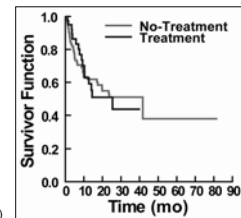


WHAT IF EXERCISES FAIL ?

- Get an MRI
- If normal you can do any or all of following
 - Nothing (6 months – 80% response to time)
 - Avoidance of provoking positions
 - Medication
 - Daily Exercise

Daily Exercises do not Reduce Recurrence

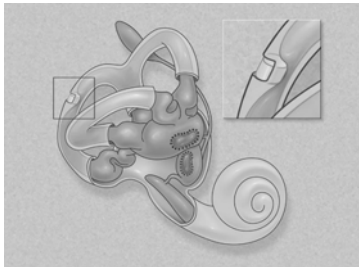
- Daily routine of Brandt-Daroff exercises does not affect the :
 - Time to recurrence of PC - BPPV
 - Rate of recurrence of PC - BPPV



(Helminski, et. al., 2005)

SURGERY

Surgery: Canal Plug Procedure – works 90% of the time (this was the pre CRP-treatment)



Select an experienced otologic surgeon. Roughly a 4% chance of hearing loss.

BPPV - Summary

- BPPV is easily diagnosed. Debris within specific anatomical locations have specific nystagmus patterns.
- PC BPPV treatment with mechanical maneuvers is highly successful.
- HC and AC BPPV have specific and logical maneuvers, but controlled studies are presently lacking.

For much more, including more movies, see:

<http://www.dizziness-and-balance.com/disorders/bppv/bppv.html>