Canalith Repositioning for Benign Paroxysmal Positional Vertigo

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

BPPV
BPV (Benign Positional Vertigo)
Positional Vertigo
(Not BPV of childhood)

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
- 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

BPPV Mechanism canaolithiasis (loose rocks)

BPPV timing: Latency, burst, reversal, fatigue

Mechanism of Latency and fatigue

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 - Upheating 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)
  - 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

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, 78 ± 16% average short term success rate of single treatment session.

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.
    - (Cattaneo, Cozzanetta, 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

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

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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 too 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

**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
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.


AC – BPPV Treatment

Kim maneuver

- Treatment for AC BPPV as proposed by Kim and associates (2005). Prospective unblinded study – 96.7% success

In position 'b', the head is turned 45 degrees towards the symptomatic side for 2 minutes.

In position 'c' debris goes around the bend 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

(Helmainty, 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 more, including more movies, see:
