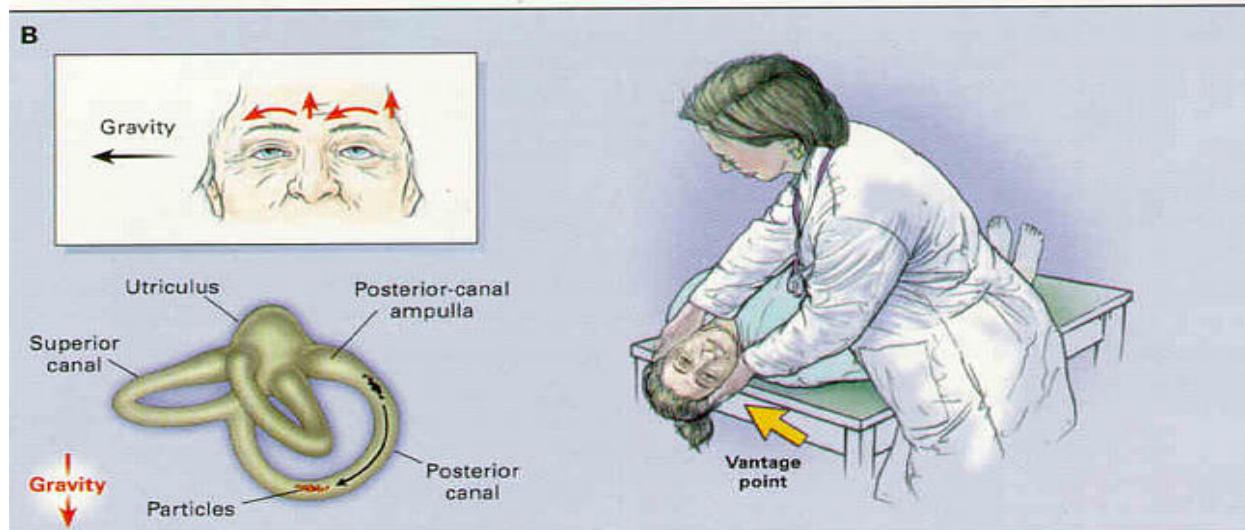
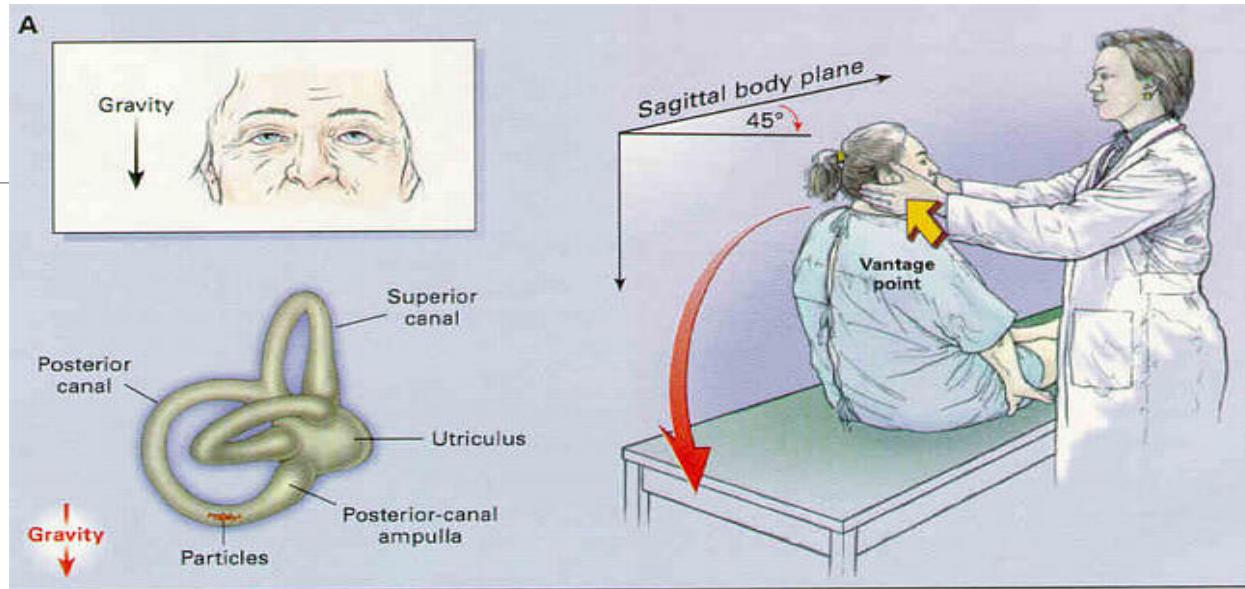


# Assistive Tools for diagnosis and treatment of BPPV

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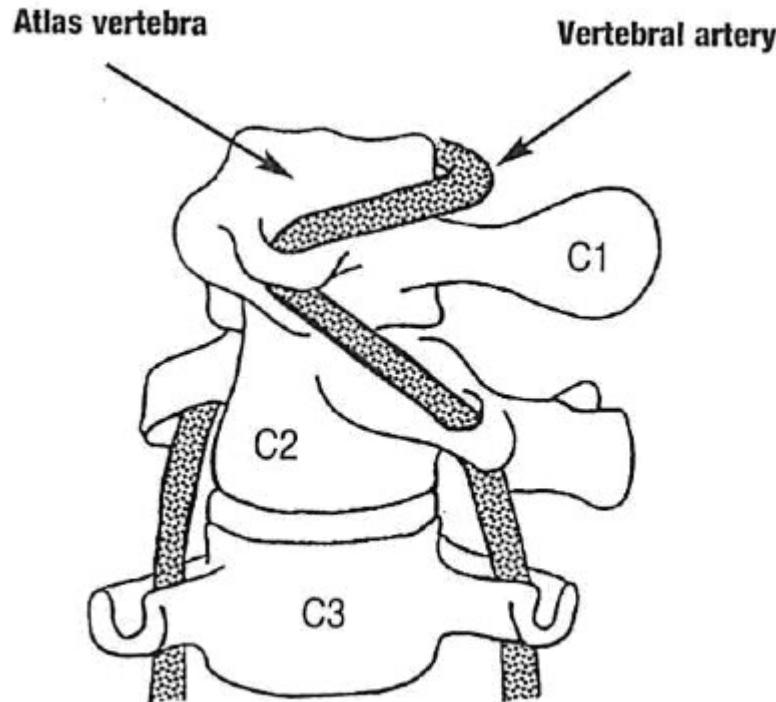
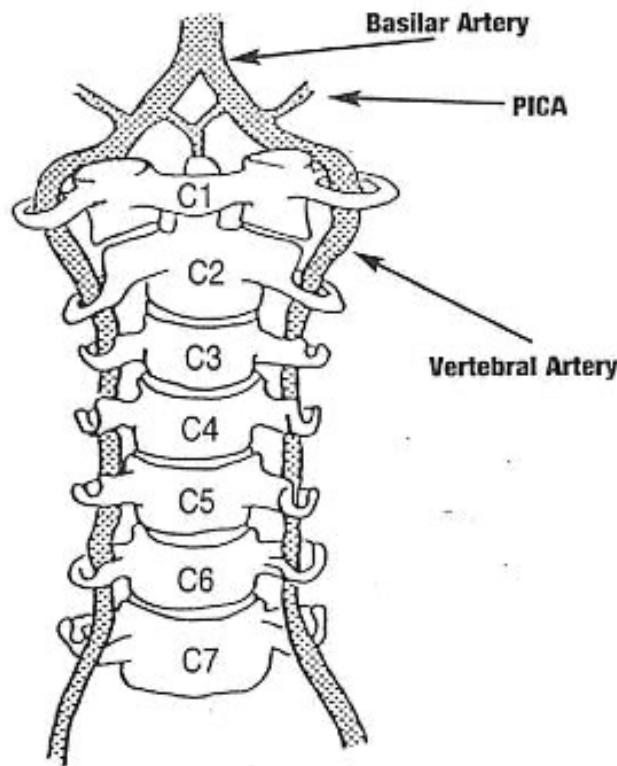
台中慈濟醫院 耳鼻喉部 復健科 李信賢醫師

# 1952 Dix-Hallpike maneuver

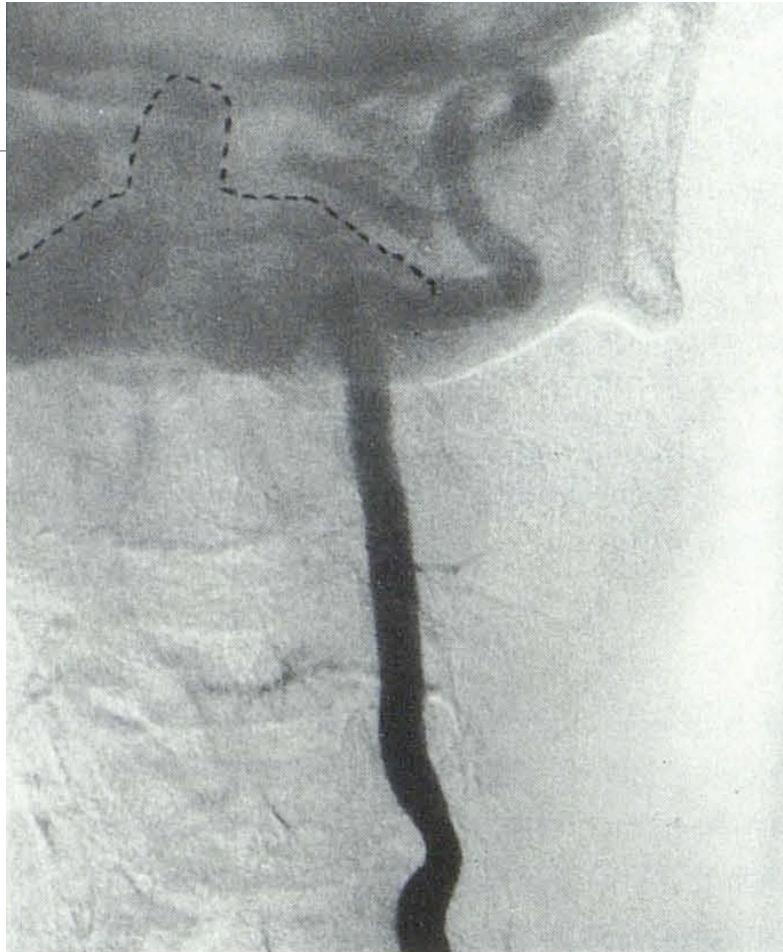


# Vertebrobasilar artery system

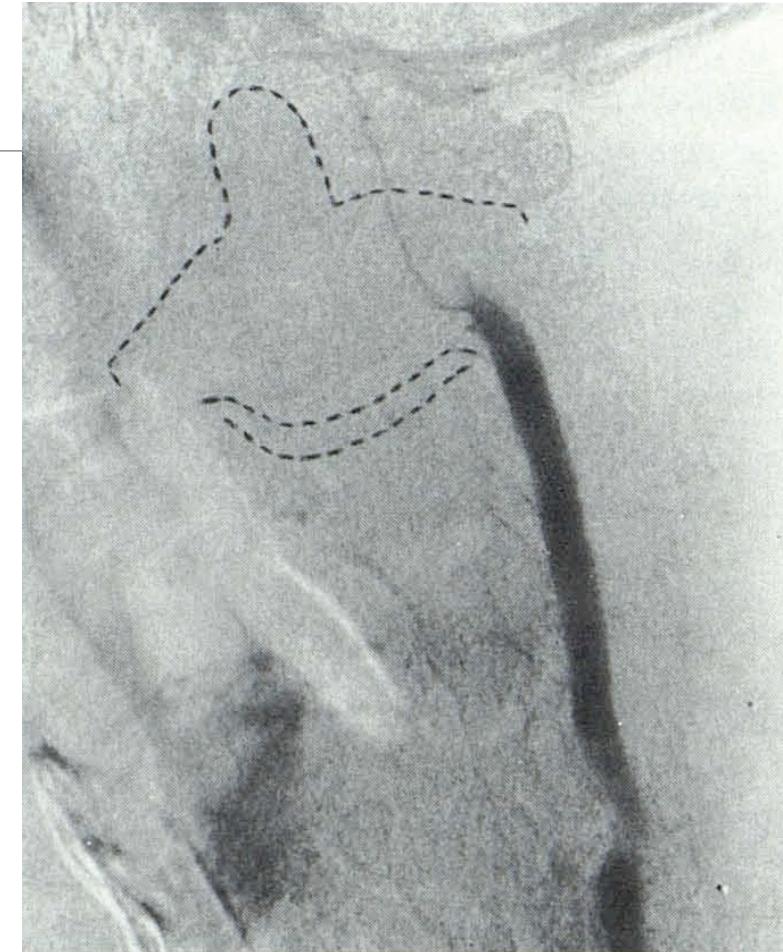
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# Rotational Vertebral Artery Occlusion at C1-C2



In neutral position without head rotation,  
normal left vertebral artery was seen.



With head rotated toward right,  
left vertebral artery occlusion was seen

# 1952 Dix-Hallpike's invention

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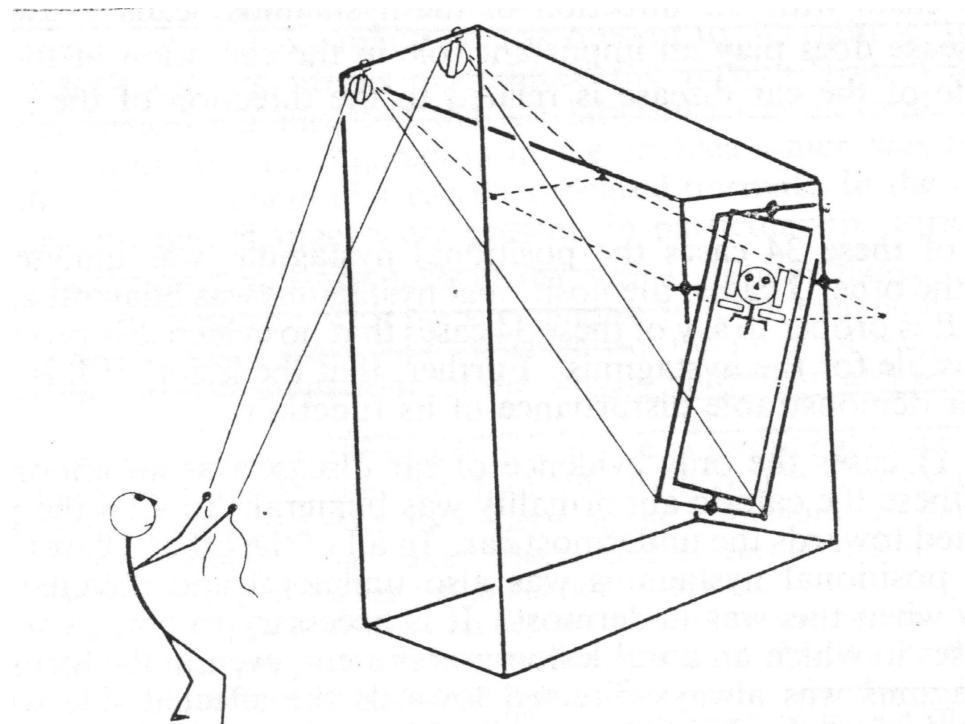


FIG. 7.

Purpose: To Avoid neck twisting

Result: To prove the vertigo/nystagmus of BPPV is evoked from the changing of head position instead of vascular compression of neck

# 1962 Schuknecht (cupulolithiasis)



1. 顯微鏡
2. 解剖已過世但生前罹患BPPV的2位患者頭顱，發現耳石沉積在頂帽上與半規管內
3. 作者認為耳石沉積在頂帽上是致病主因，故提出頂帽沉石理論

# Findings in Schuknecht's microscope Cupulolith and Canalith

770

## CUPULOLITHIASIS—SCHUKNECHT

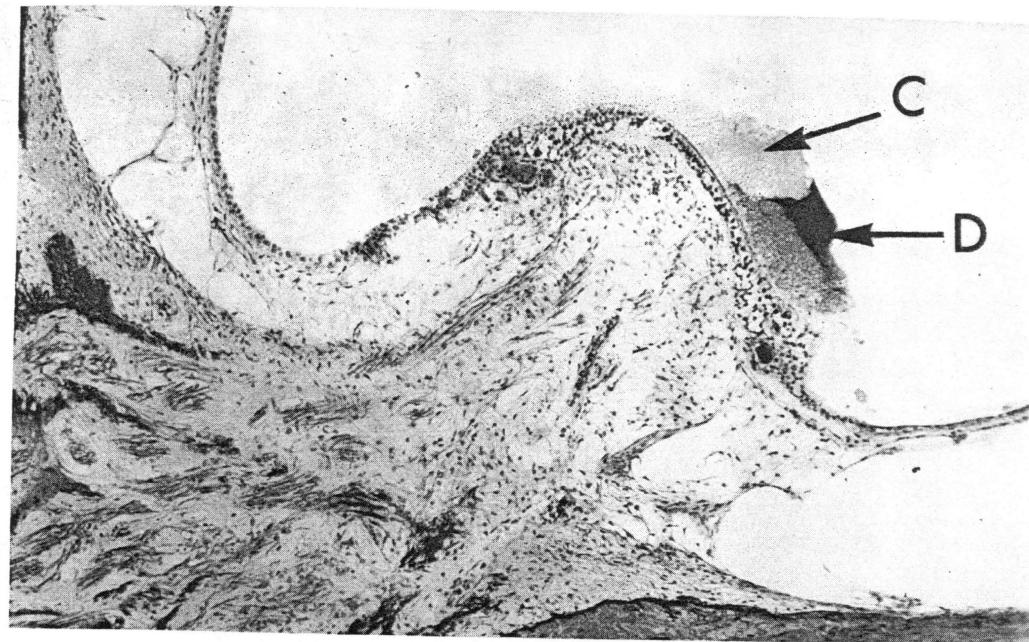
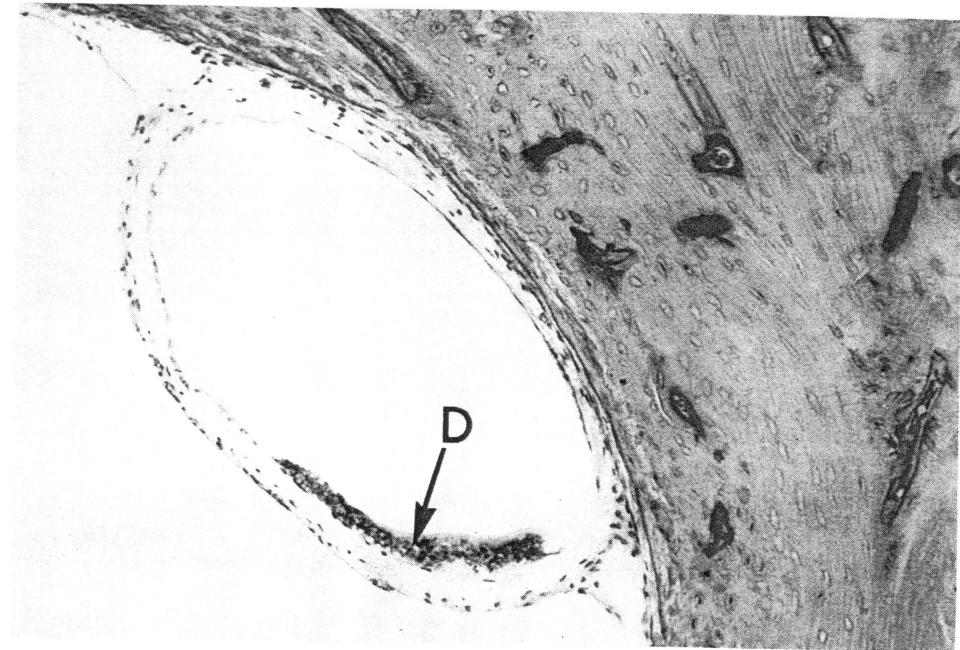


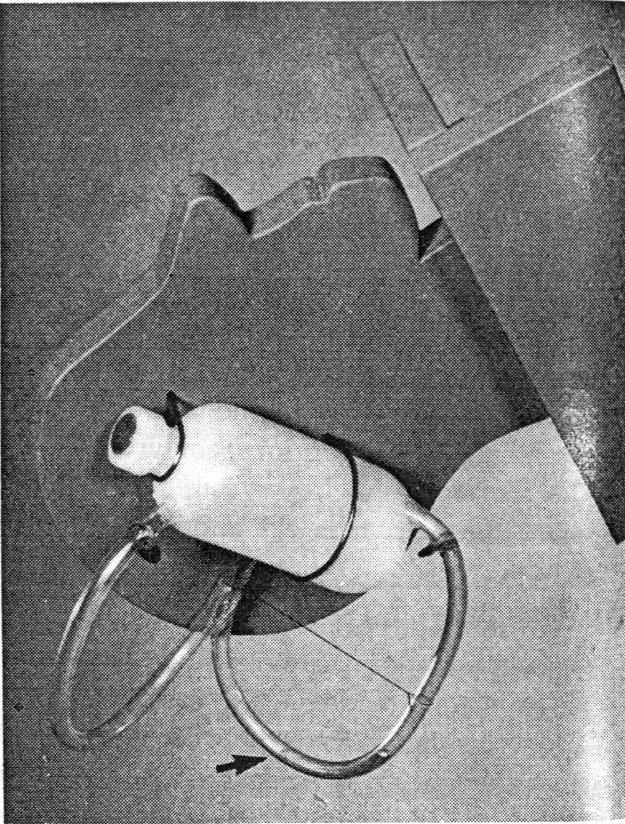
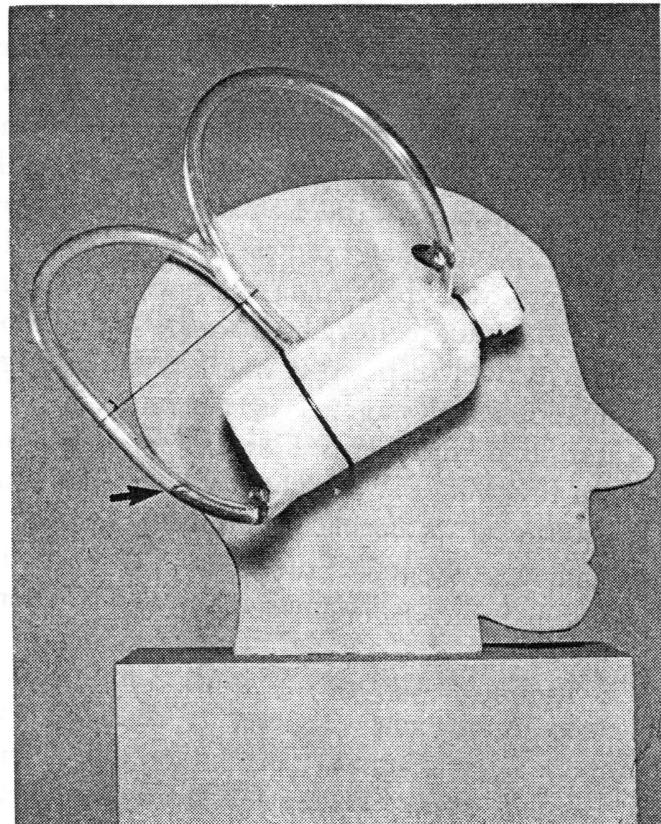
Fig 2.—Dense deposit (D) on the cupula (C) of the posterior semicircular canal of the left ear. Tests for positional vertigo provoked a severe vertiginous episode of short duration associated with clockwise rotatory nystagmus when she was placed in the supine left-ear-down position (case No. 1).

Fig 6.—There is a thin layer of granular deposit (D) on the membranous wall of the left posterior semicircular canal in its most inferior portion (case No. 2).



# 1979 Hall S.F. et al (canalolithiasis)

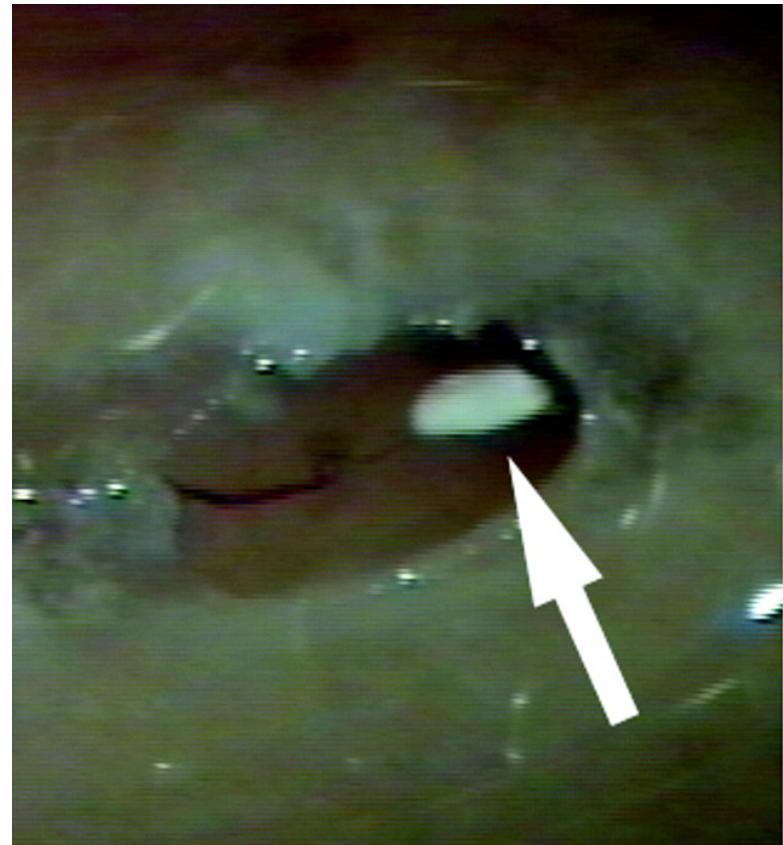
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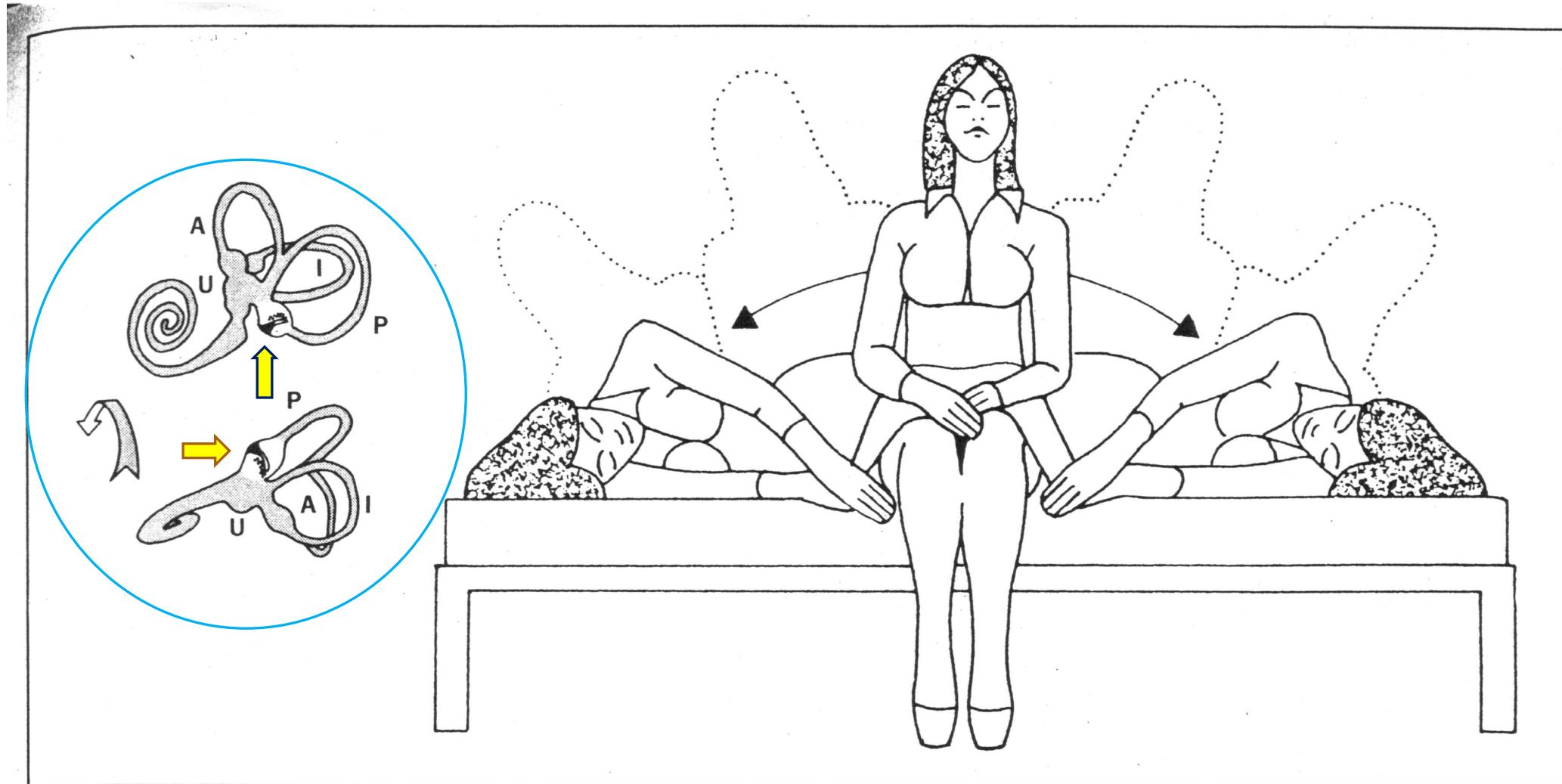
塑膠軟管  
塑膠瓶  
水銀  
木片

Fig. 2. Mercury is used to represent endolymph densities. With positional testing the mercury moves in the ampullo-fugal direction.

1992 Parnes, L.S. McClure, J.A (canal plugging)  
2001 Agrawal S.K. and Parnes, L.S.

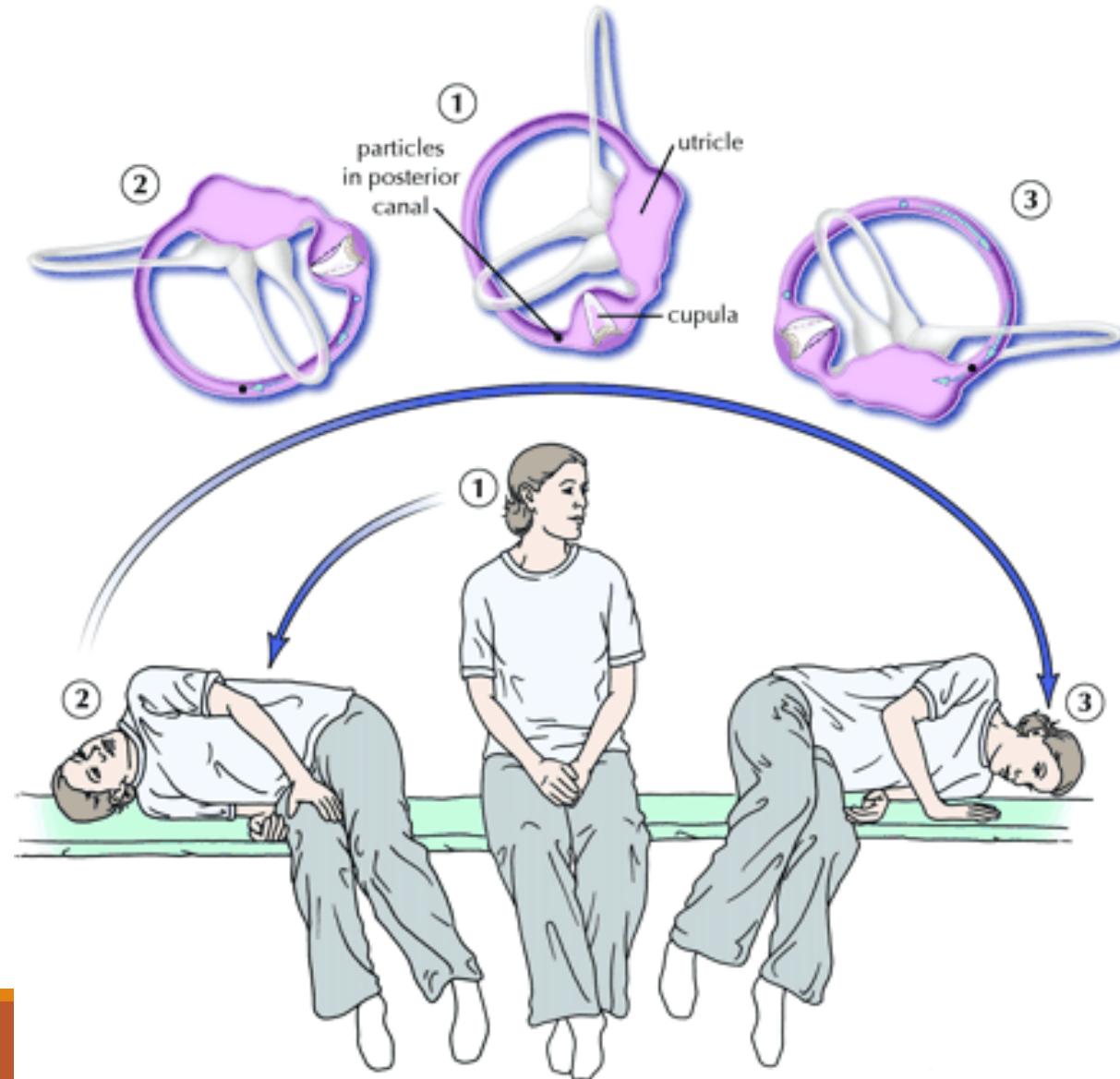


# Brandt –Daroff exercise 1980



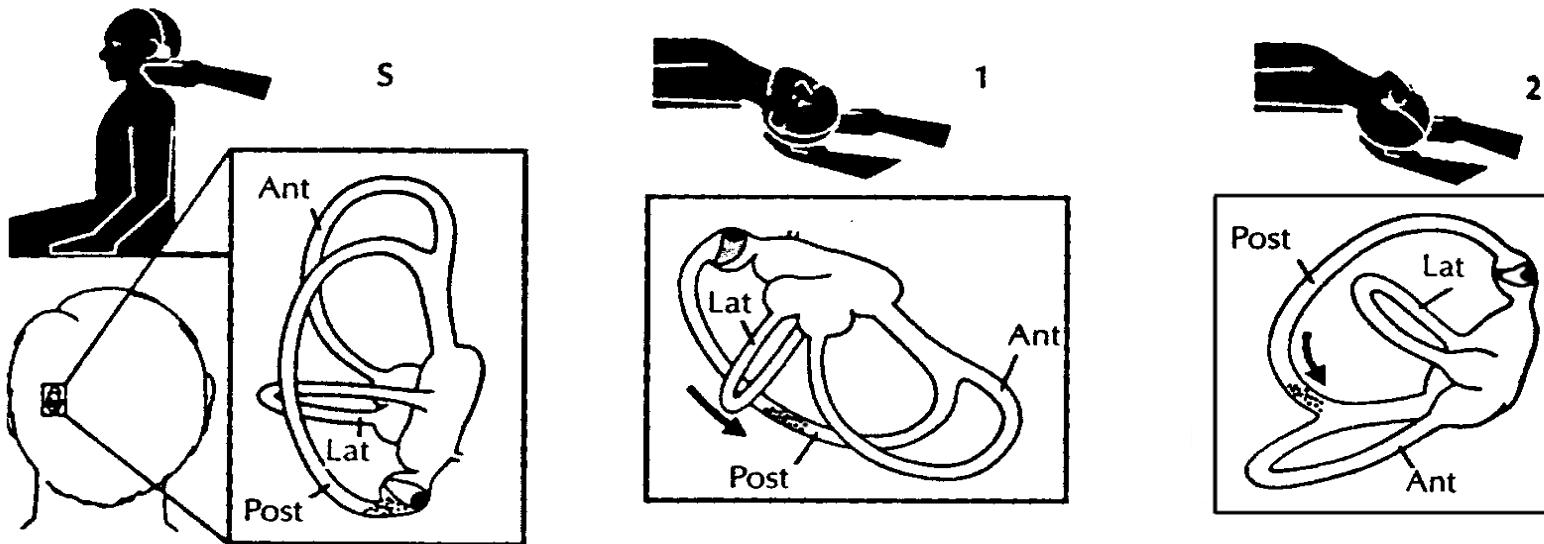
Sequence of repetitive positionings in patients with benign paroxysmal positional vertigo in seated position, with eyes closed. Corresponding location of right labyrinth is depicted at left. With response to gravity, ampulla of posterior canal (P) is situated inferior to utricle (U) when head is upright, but superior in precipitating head position. A indicates anterior canal; I, inferior canal.

# Semont maneuver (PC-BPPV) 1980,1988

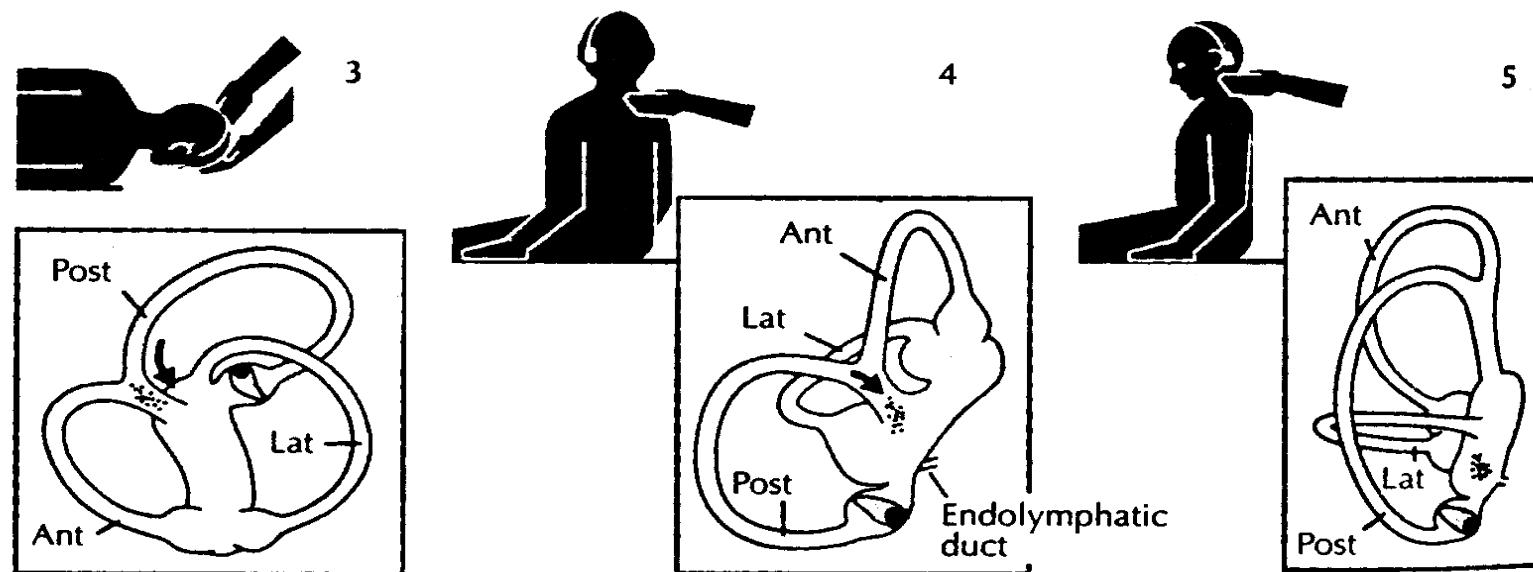


Right PC-BPPV

# Epley's Maneuver (PC-BPPV) 1992



left PC-BPPV



# 1985 McClure. JA (HC-BPPV canalith) electronystagmography

SUPINE TO RIGHT LATERAL POSITION



SUPINE TO LEFT LATERAL POSITION

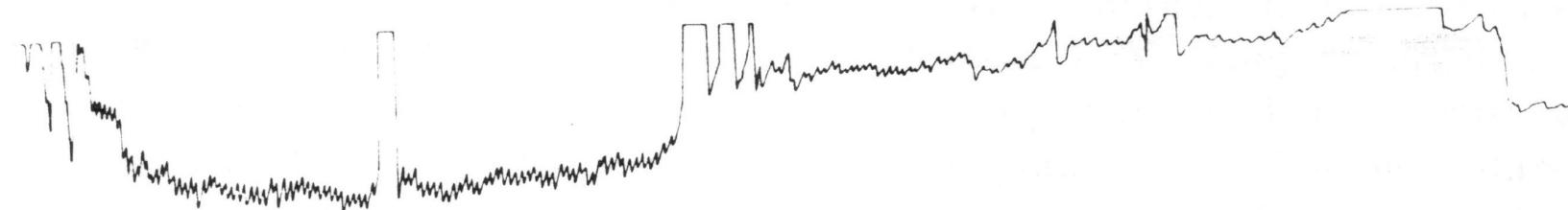
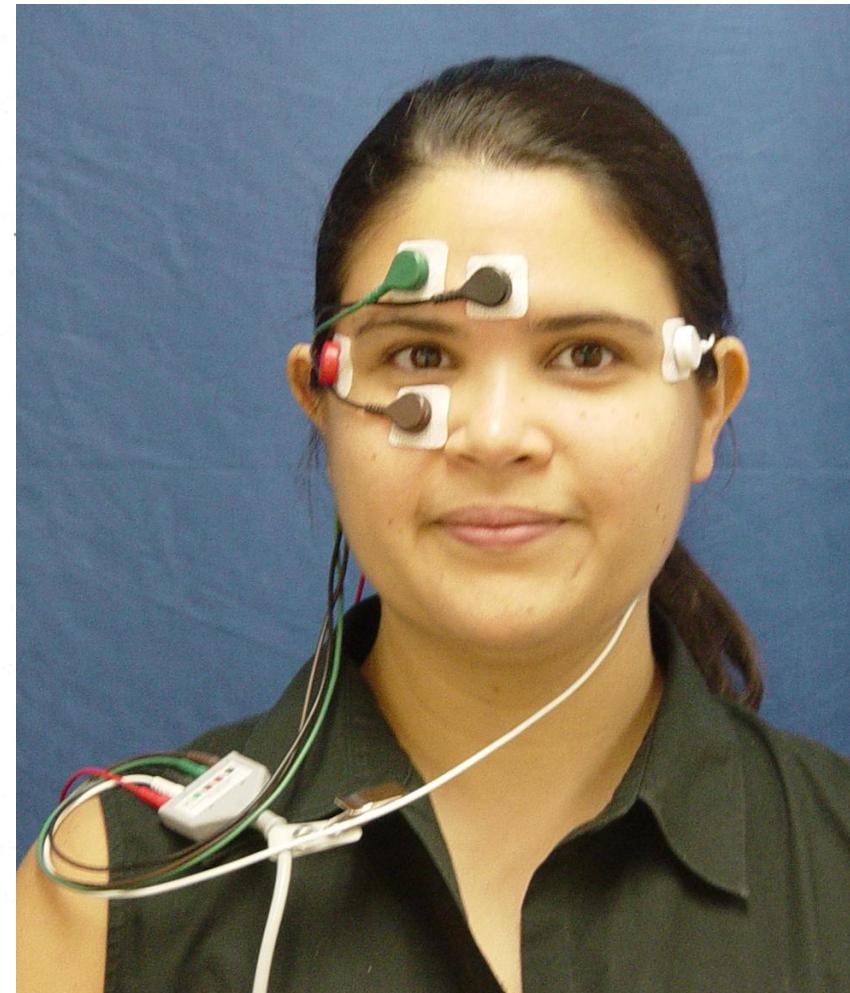
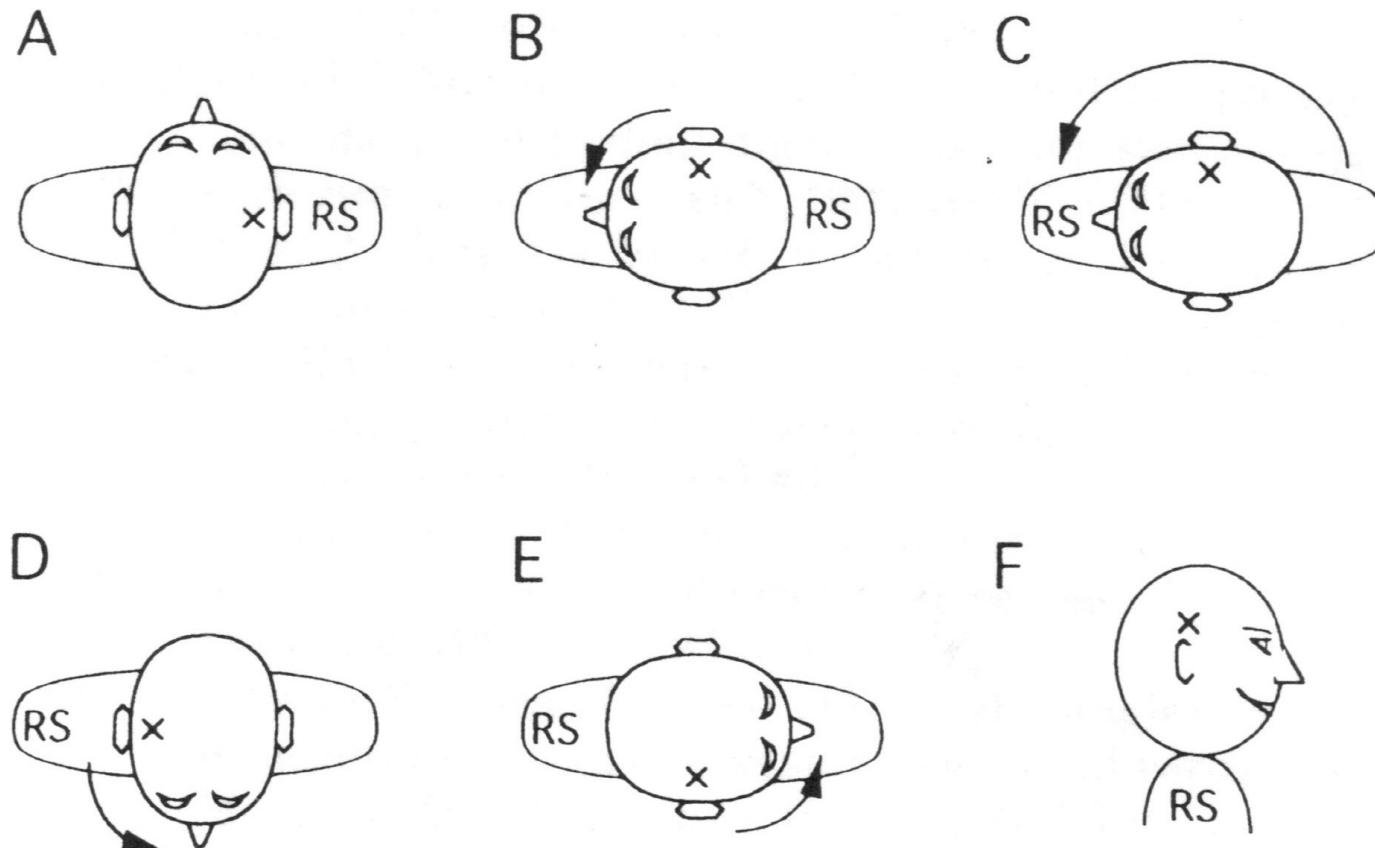


Fig. 6. Actual ENG recording (eyes closed) of horizontal nystagmus with position change for Case 6 (H.K.). Note the intense nystagmus lasting about 25 sec that follows each position change with the nystagmus directed in the same direction as the position change.



# 1996 Lempert's maneuver (Barbecue) for HC-BPPV canalith type

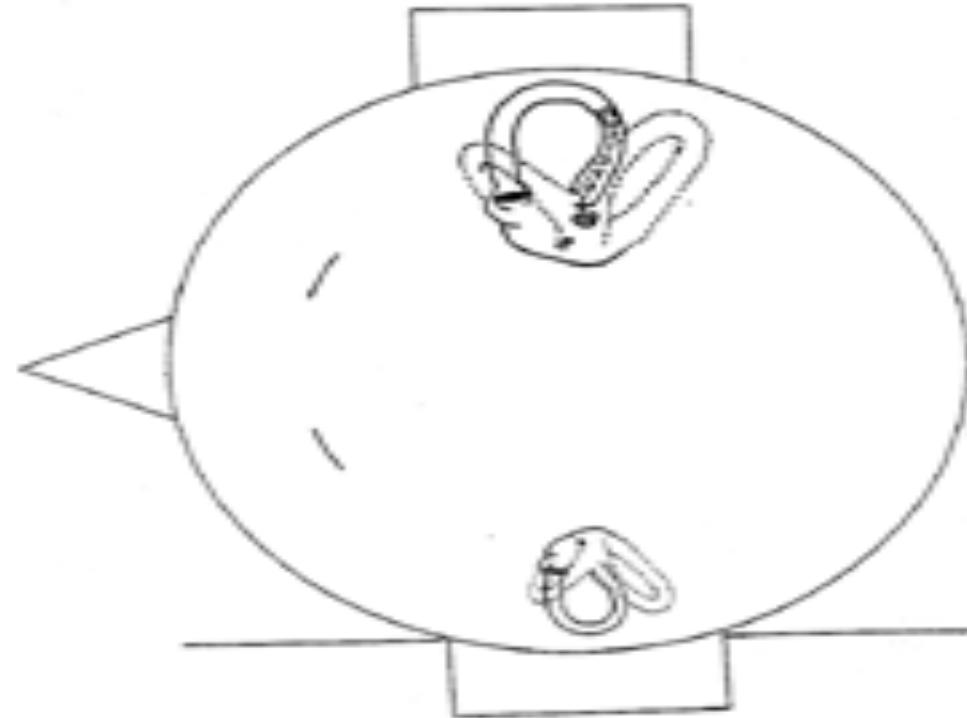
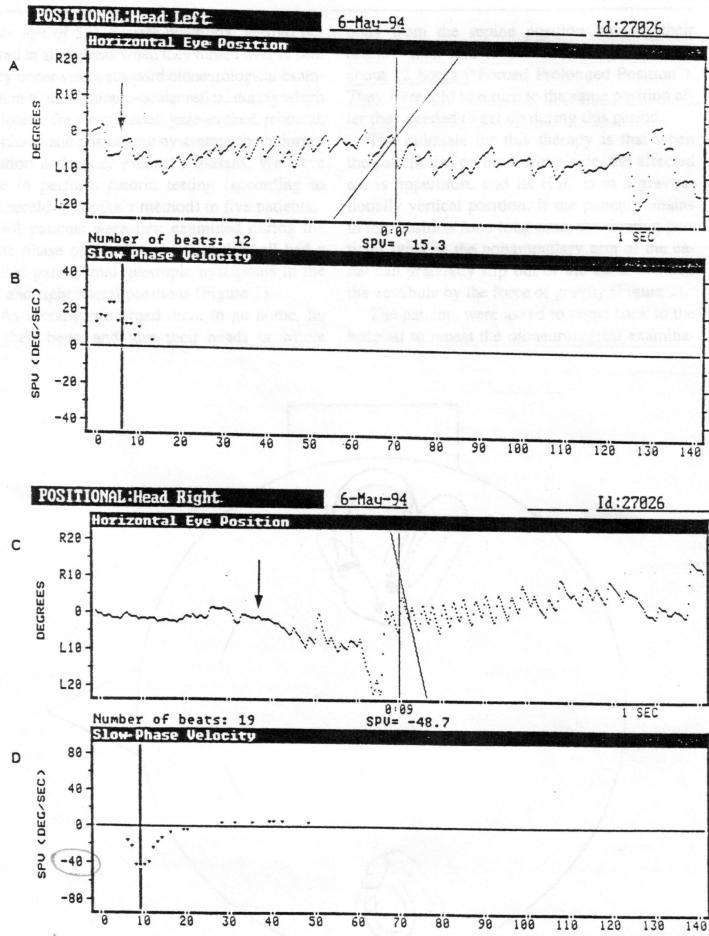
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# 1997 Vannucchi (Force Prolonged position)

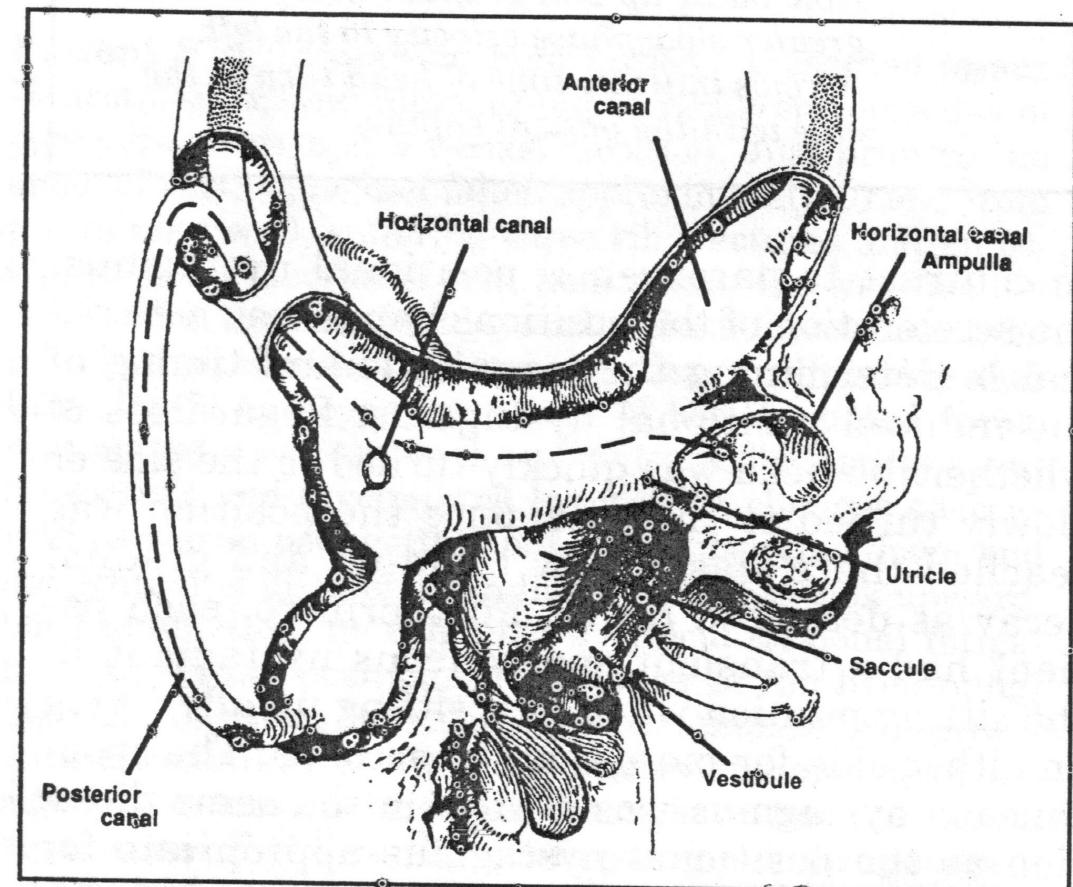
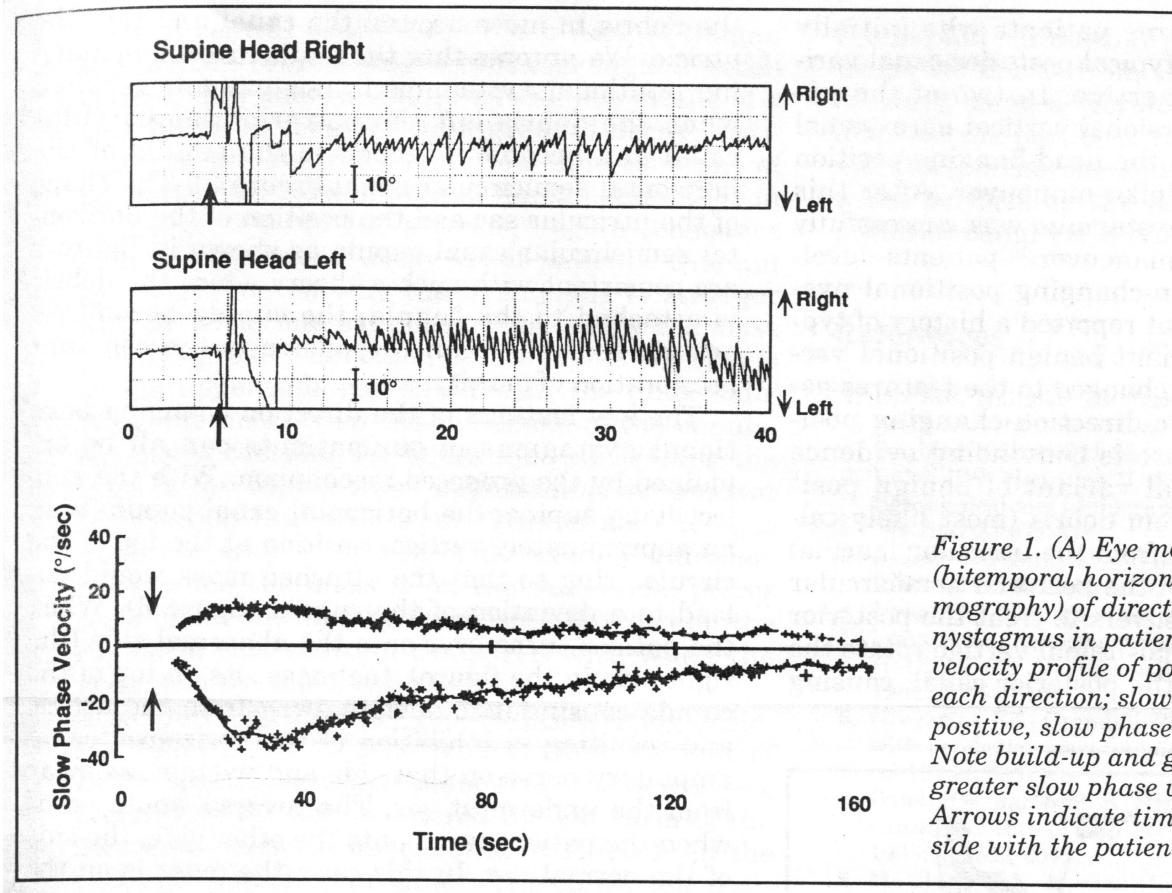
2

P. Vannucchi et al

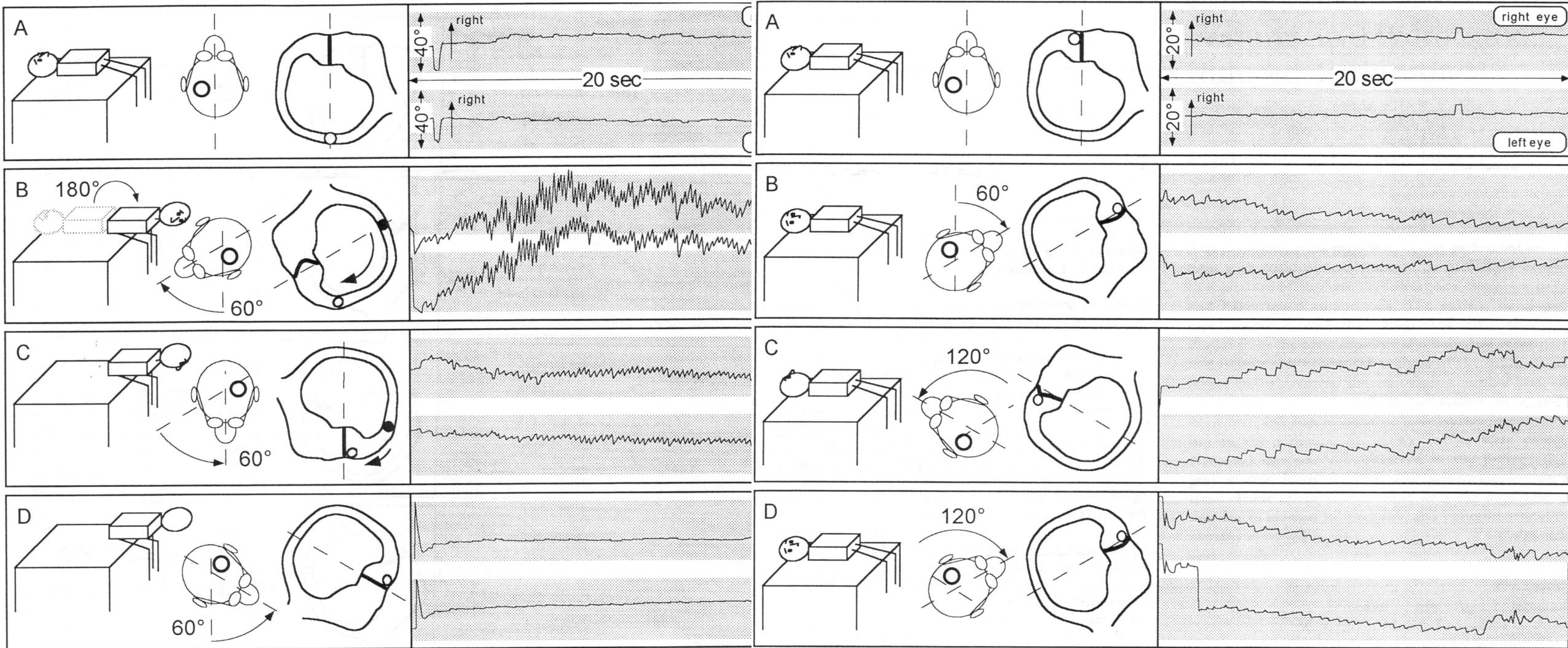


側躺健側12小時

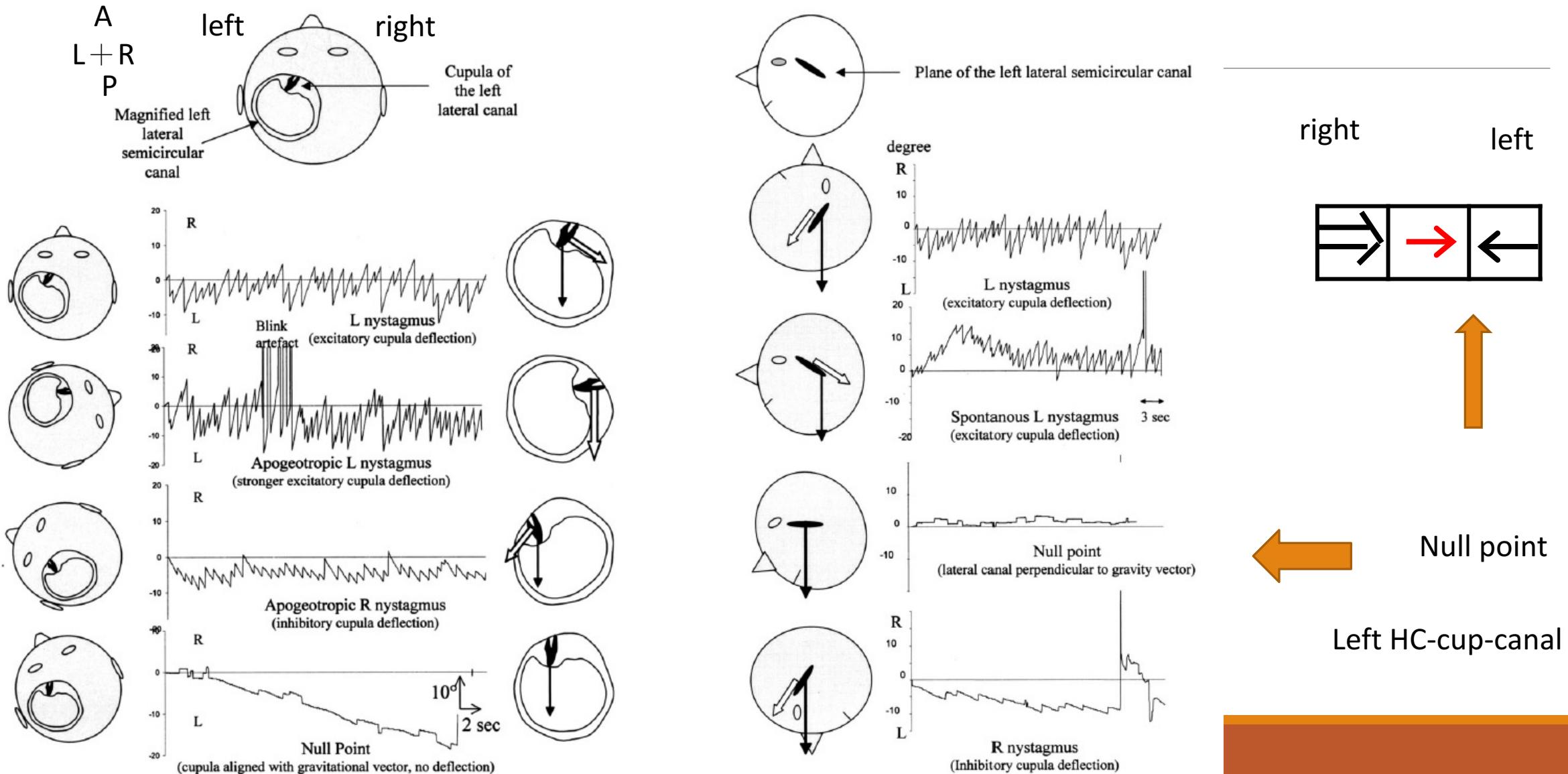
# 1995 Baloh et al (ENG) HC-BPPV, cupulolith, utricle side



# 1996 Steddin et al (ENG + head position) HC-BPPV, from canalithiasis to cupulolithiasis



2001 Alexandre R. st al (ENG+head position)  
lateralization signs of HC-BPPV cupulolith (null point)

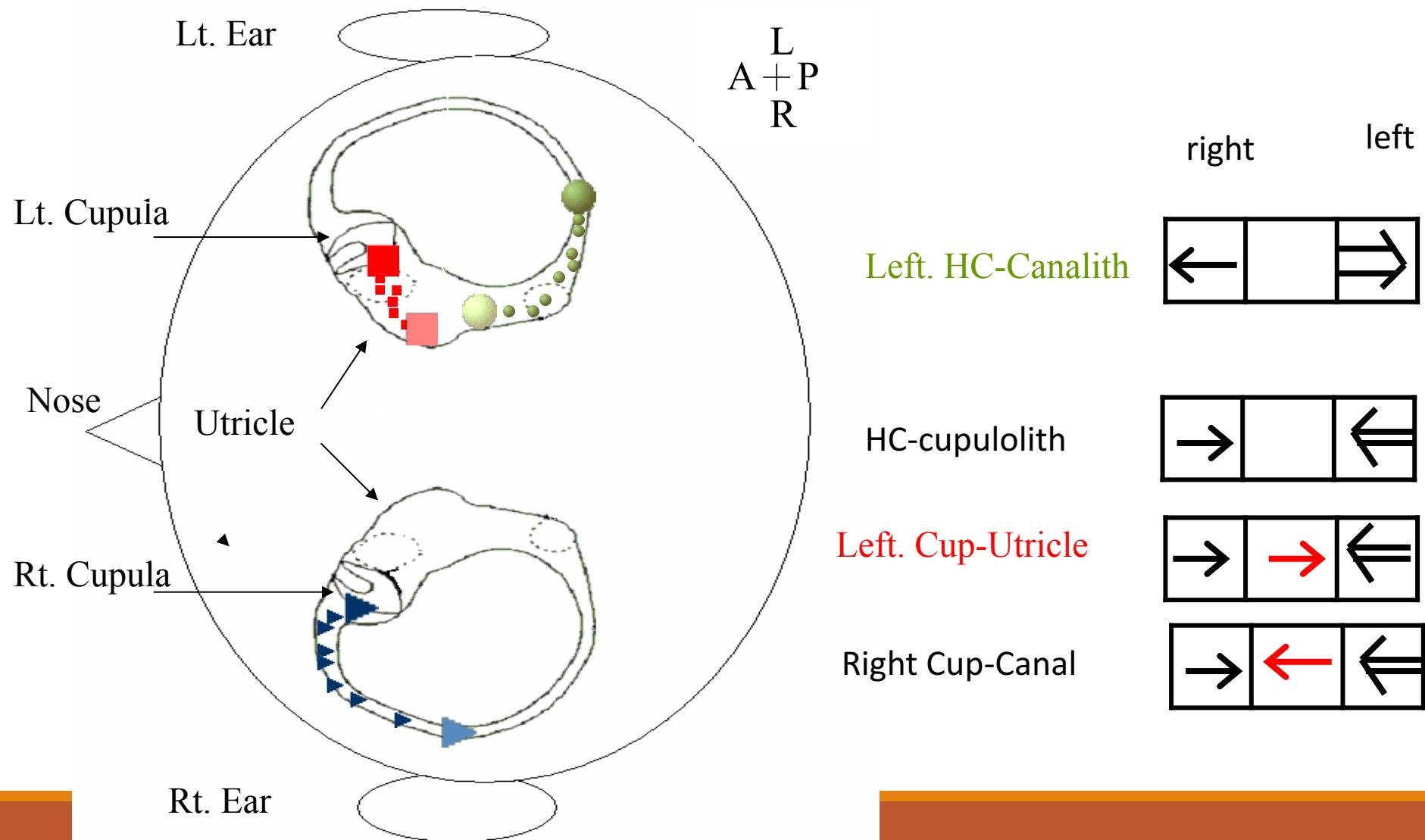


# Videonystagmography + one camera



# Treatment of HC-BPPV: 側躺眼振弱側持續12小時

2005 邱文耀 李信賢 蔡世哲 國軍松山醫院



# PC-BPPV 立體動態模型

## 2001 國軍松山醫院 李信賢醫師



# HC-BPPV立體動態模型

## 2005年 國軍松山醫院 邱文耀醫師

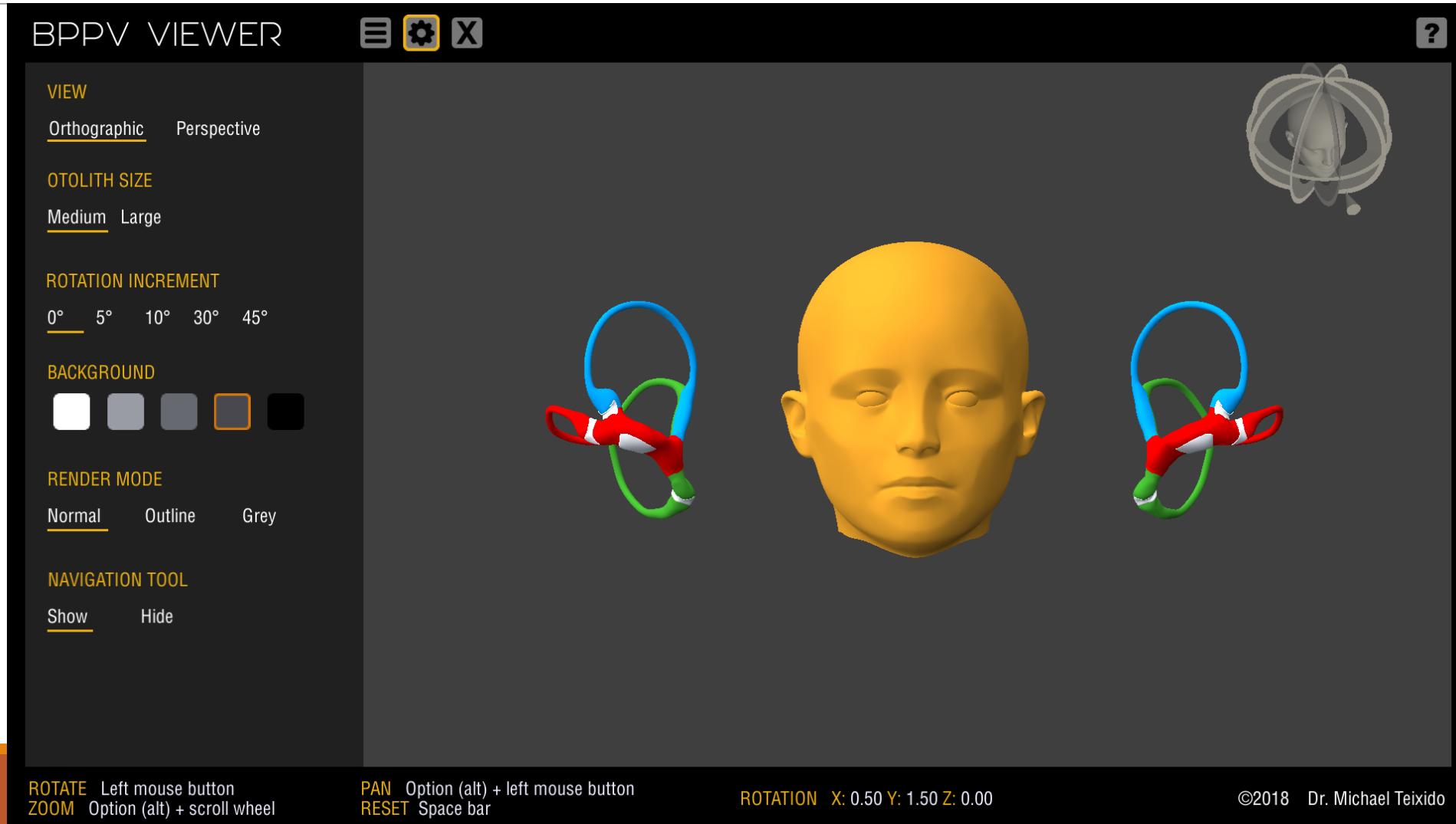


# AC-BPPV 立體動態模型 2010 李信賢醫師



# BPPV Viewer(membranous labyrinth)

## 2016 Michael Teixido:



# 2008 Bromwich MA(1), Parnes LS DizzvFix (home exercise)



# Kezlex (日本製): BPPV training model Semicircular Canal + Movable Statoliths



# 簡易耳石定位儀(可用鐵絲網與髮圈自製)



Sextant of otolith (耳石定位儀)

2019 李信賢醫師



# Canalith repositioning procedure for left posterior canal-BPPV

