VDT
Vertigo Deafness Tinnitus

18th WORKSHOP ON NEUROTOLOGY
and MEDICAL AUDIOLOGY in KOLKATA

29th Nov to 1st Dec 2019

Apogeotropic positional nystagmus: causes and management

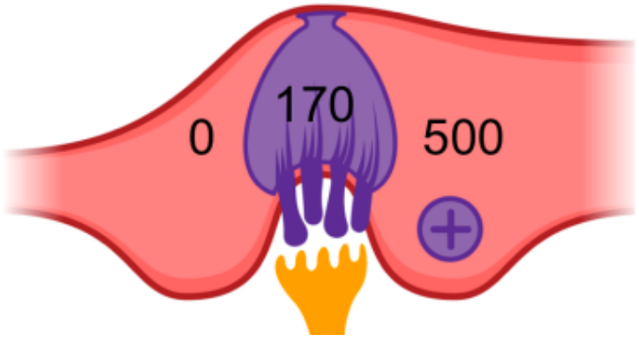
Francesco Dispenza MD PhD

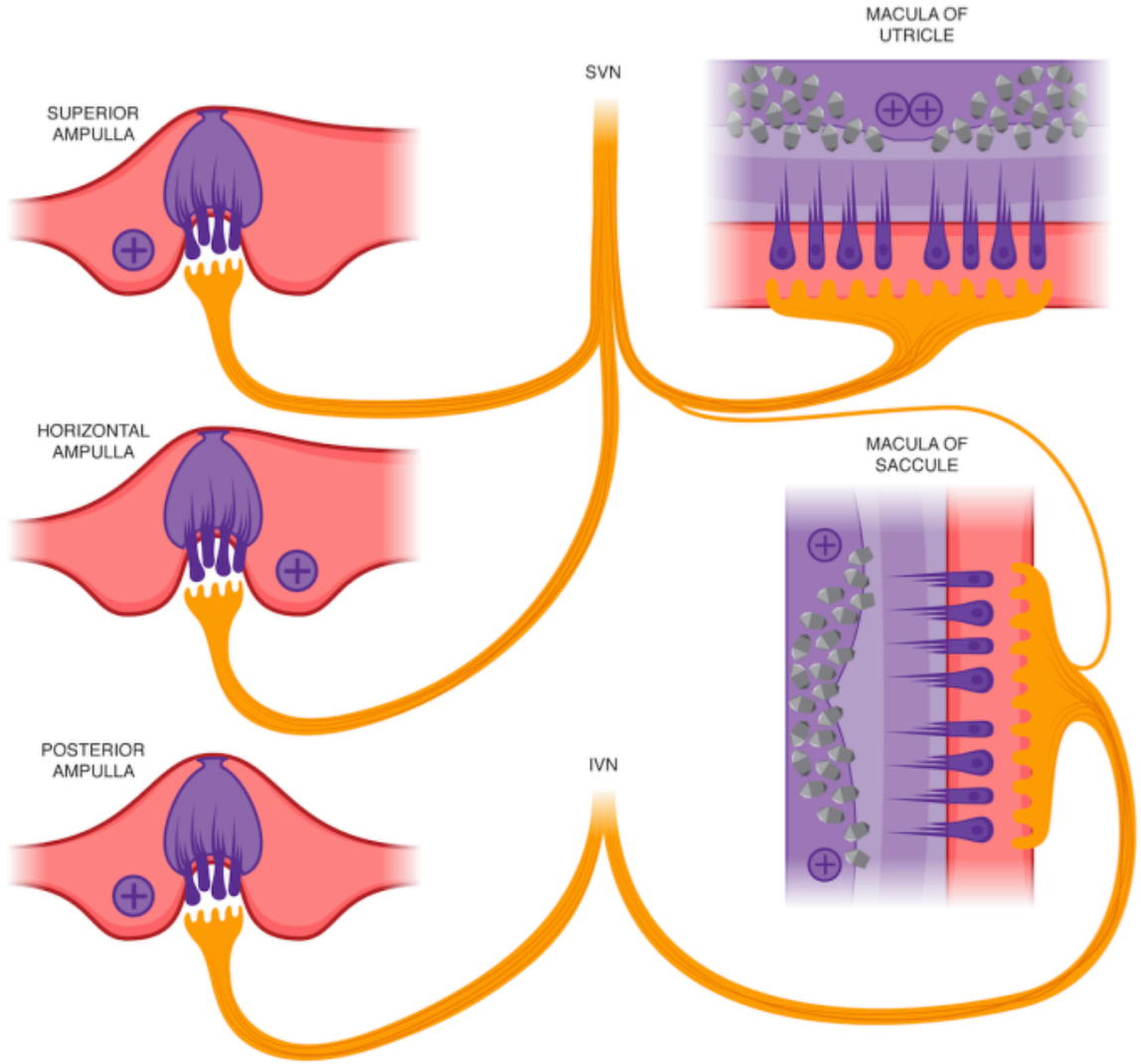
Ewald’s law

- **First**: the eye movements are in the plane of the canal being stimulated

- **Second**: the excitation of any canal creates a greater response than inhibition

- **Third**: the ampullopetal flow creates a stronger response in the lateral canal, and ampullofugal flow creates the strongest response in vertical canals





The three basic point of positional nystagmus

- Plane
- Duration
- Geotropism

Table 2
Checklist of attributes for nystagmus characterization

Nystagmus Trajectory: axis or plane of rotation and direction in straight-ahead (center) gaze position including horizontal, vertical, and torsional components
Binocularity: monocular or binocular
Conjugacy: conjugate or disconjugate (dissociated or disjunctive)
Velocity: quantitative measurement of slow-phase velocity
Waveform: pendular or jerk
Frequency: most useful for low-frequency (<3 Hz) forms of pendular nystagmus
Intensity: qualitative assessment as product of amplitude and frequency
Eccentric gaze influence on presence or attributes of nystagmus including direction (from a head-referenced or eye-referenced coordinate system)
Effect of convergence
Influence of permitting versus blocking visual fixation
Effect of provocative maneuvers
Age of first appearance
Temporal profile: intermittent, continuous, or changing over time

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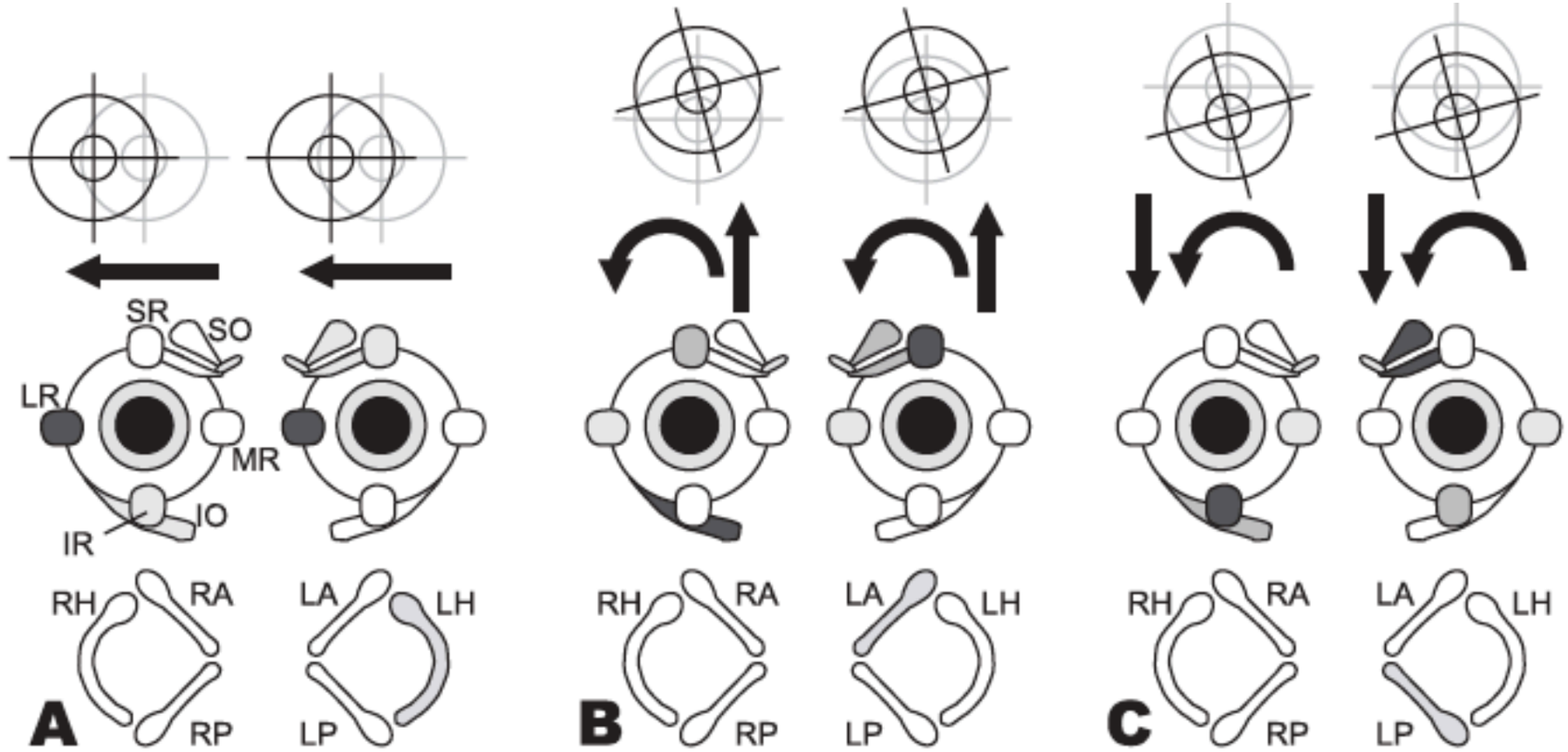
Classification of vestibular signs and examination techniques: Nystagmus and nystagmus-like movements

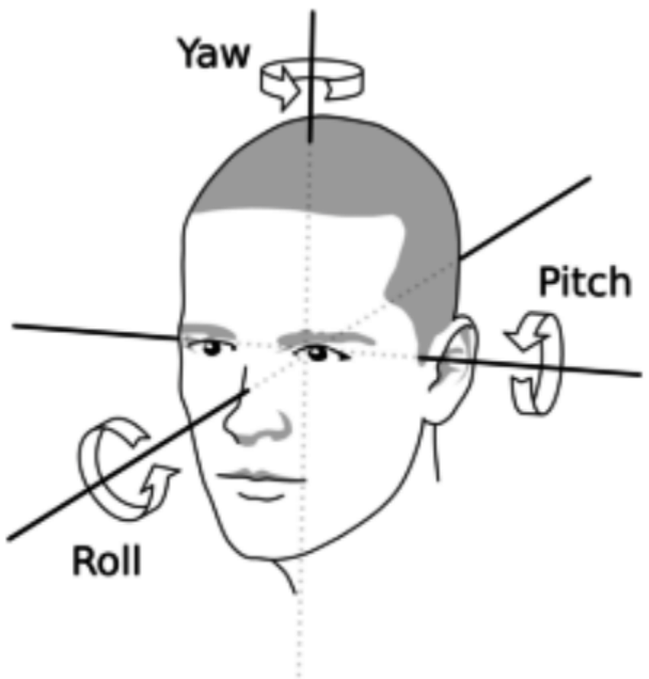
Consensus document of the Committee for the International Classification of Vestibular Disorders of the Bárány Society

Scott D.Z. Eggers[a,*], Alexandre Bisdorff[b], Michael von Brevern[c], David S. Zee[d], Ji-Soo Kim[e], Nicolas Perez-Fernandez[f], Miriam S. Welgampola[g], Charles C. Della Santina[h] and David E. Newman-Toker[d,h]

Plane

- the ocular movement is on the same plane of the semicircular canal activated by otoliths displacement (First Ewald's law)



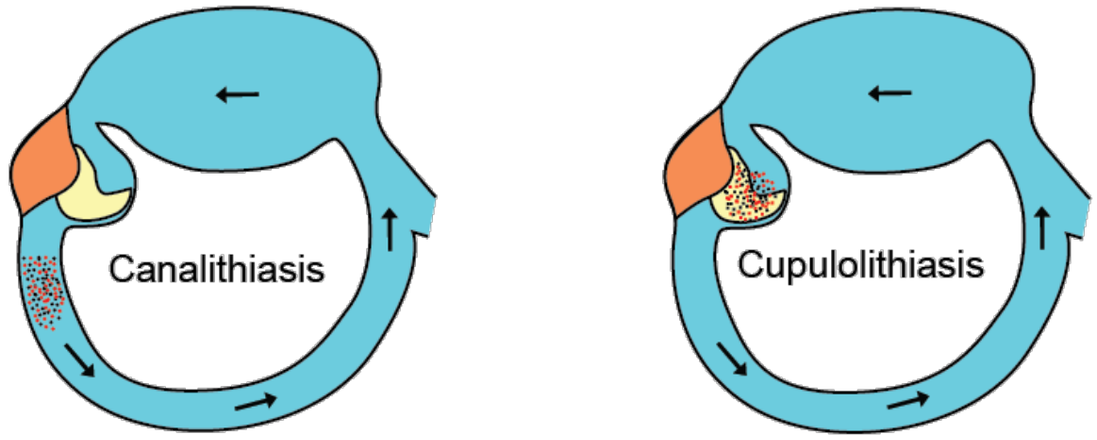


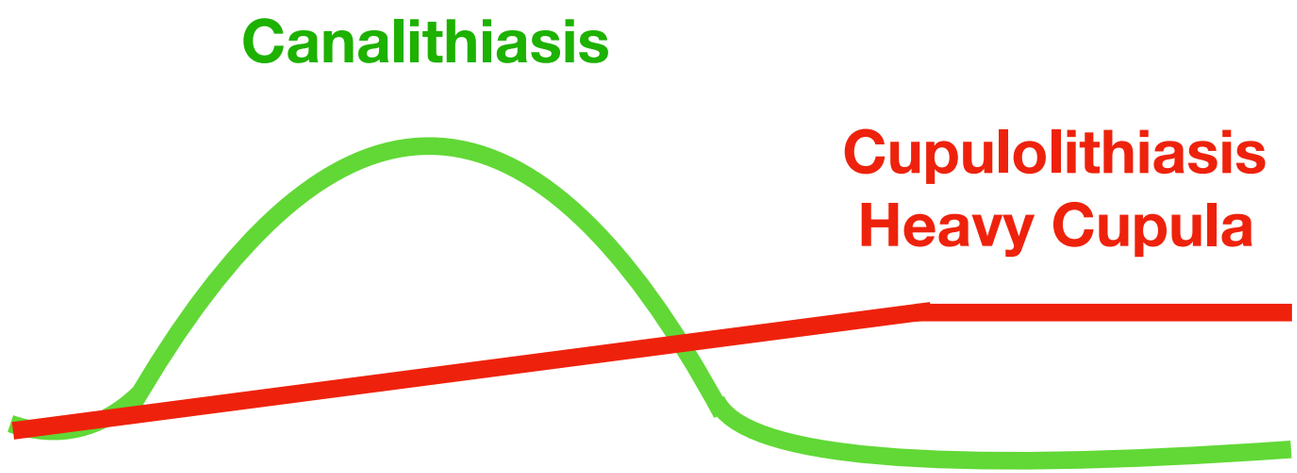
Duration

- In paroxysmal positional vertigo the duration of Ny depend upon site of otoliths

- Canalithiasis: crescendo-decrescendo until spontaneous end of Ny and “fatiguable”

- Cupulolithiasis: crescendo until steady state without end





Ny Geotropism in BPPV

- Nystagmus with geotropism modifies its direction in relation to the head position with respect to the gravitational field

- **Direction Changing**: Ny changes its direction modifying head position; the same position assumed evokes always the same Ny direction

- **Ny Direction:** Geotropic (toward the undermost ear), Apogeotropic (toward the uppermost ear)

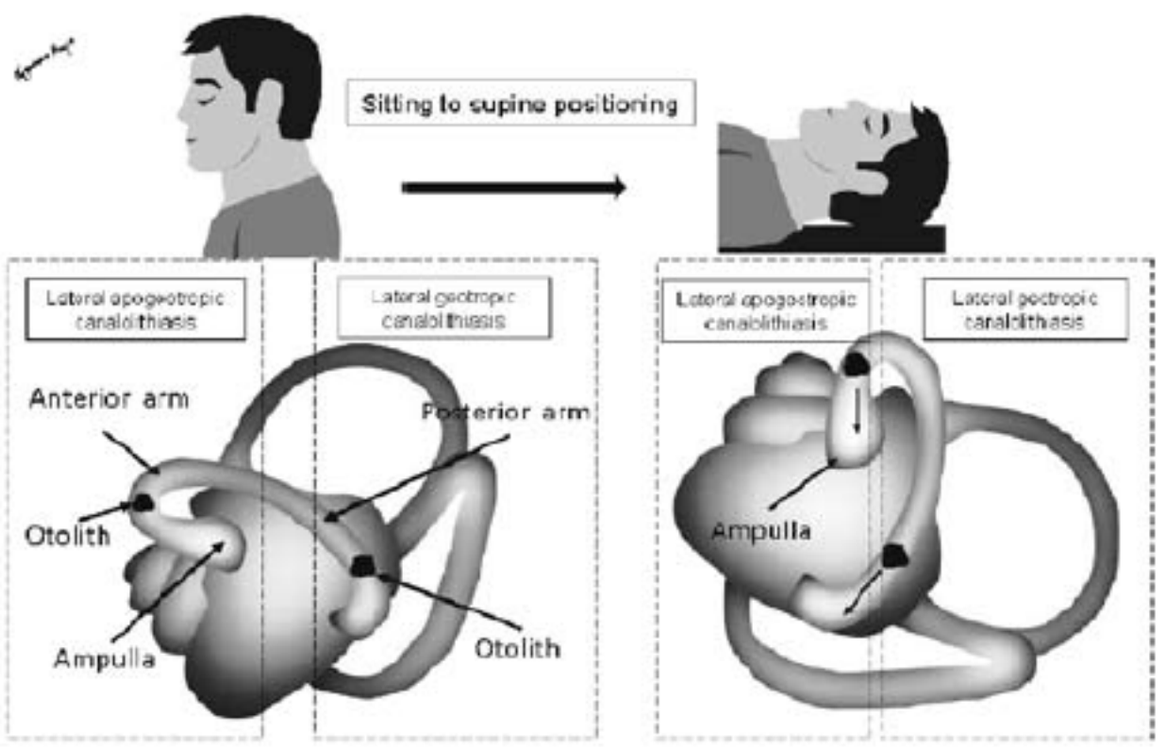
Apogeotropic Nystagmus

- Horizontal Semicircular Canal (HSC):
  - canalithiasis of ampullary arm
  - cupulolithiasis
  - heavy cupula
  - canalith jam
- Posterior Semicircular Canal (PSC):
  - canalithiasis of the non-ampullary arm

Apogeotropic Ny in HSC BPPV

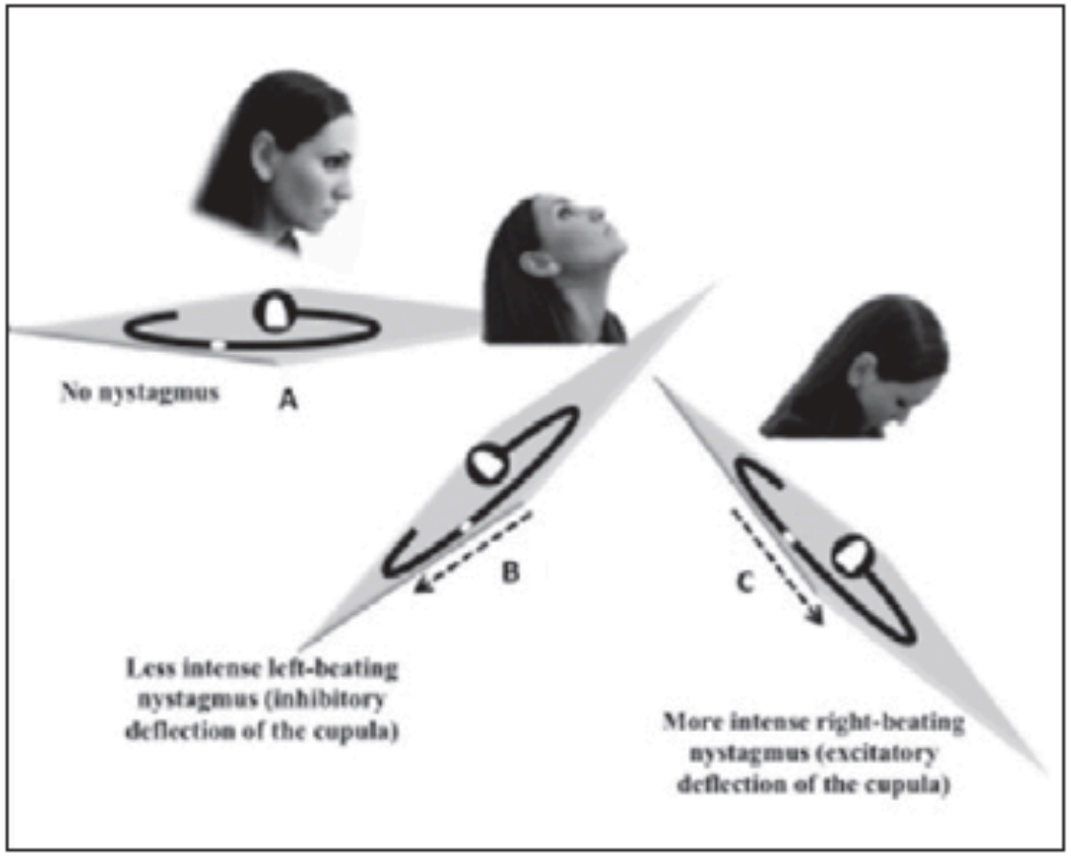
- in the sitting position it's possible to observe a pseudospontaneous Ny directed toward the affected side

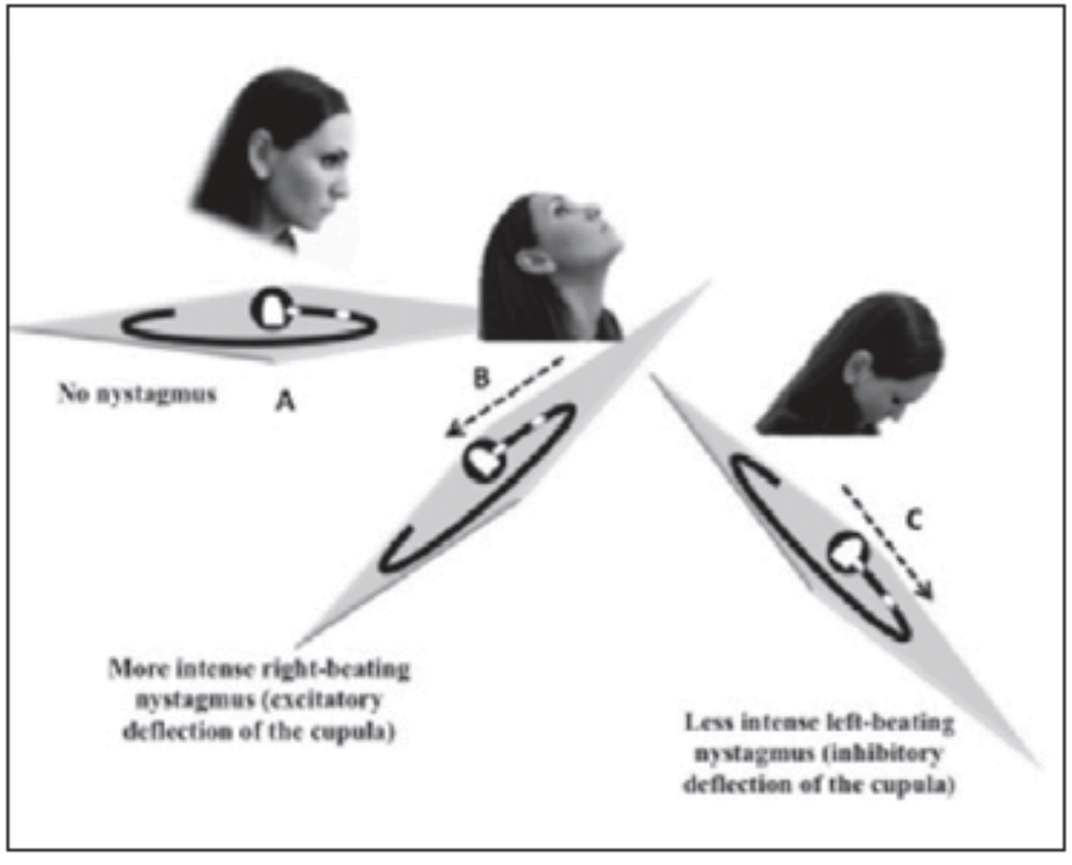
- in the sitting to supine positioning we elicit a horizontal Ny directed to the affected side or an increased intensity of the pseudospontaneous Ny (gravity)



Apogeotropic Ny in HSC BPPV

- the main question in HSC BPPV is the identification of the side affected by BPPV

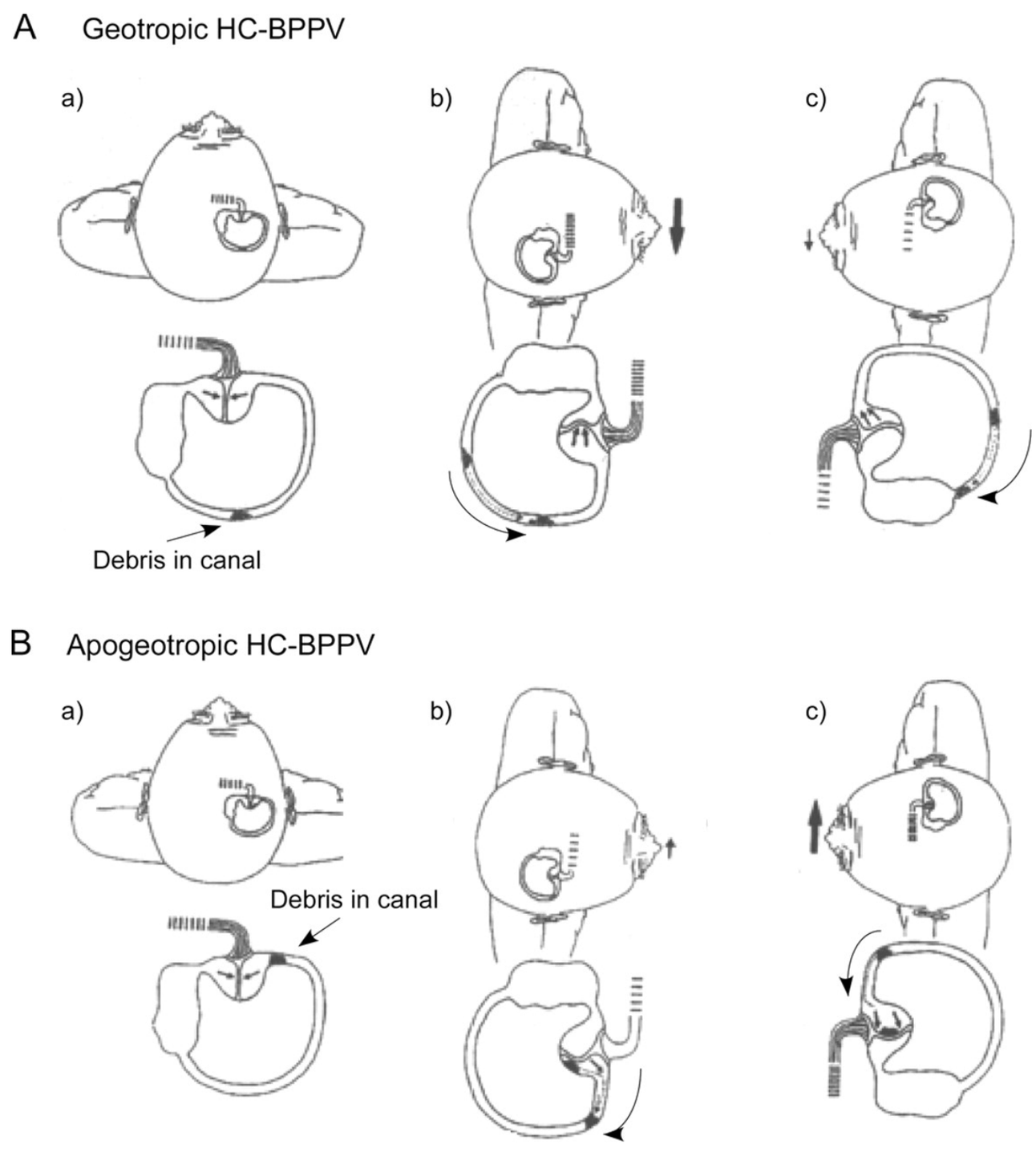




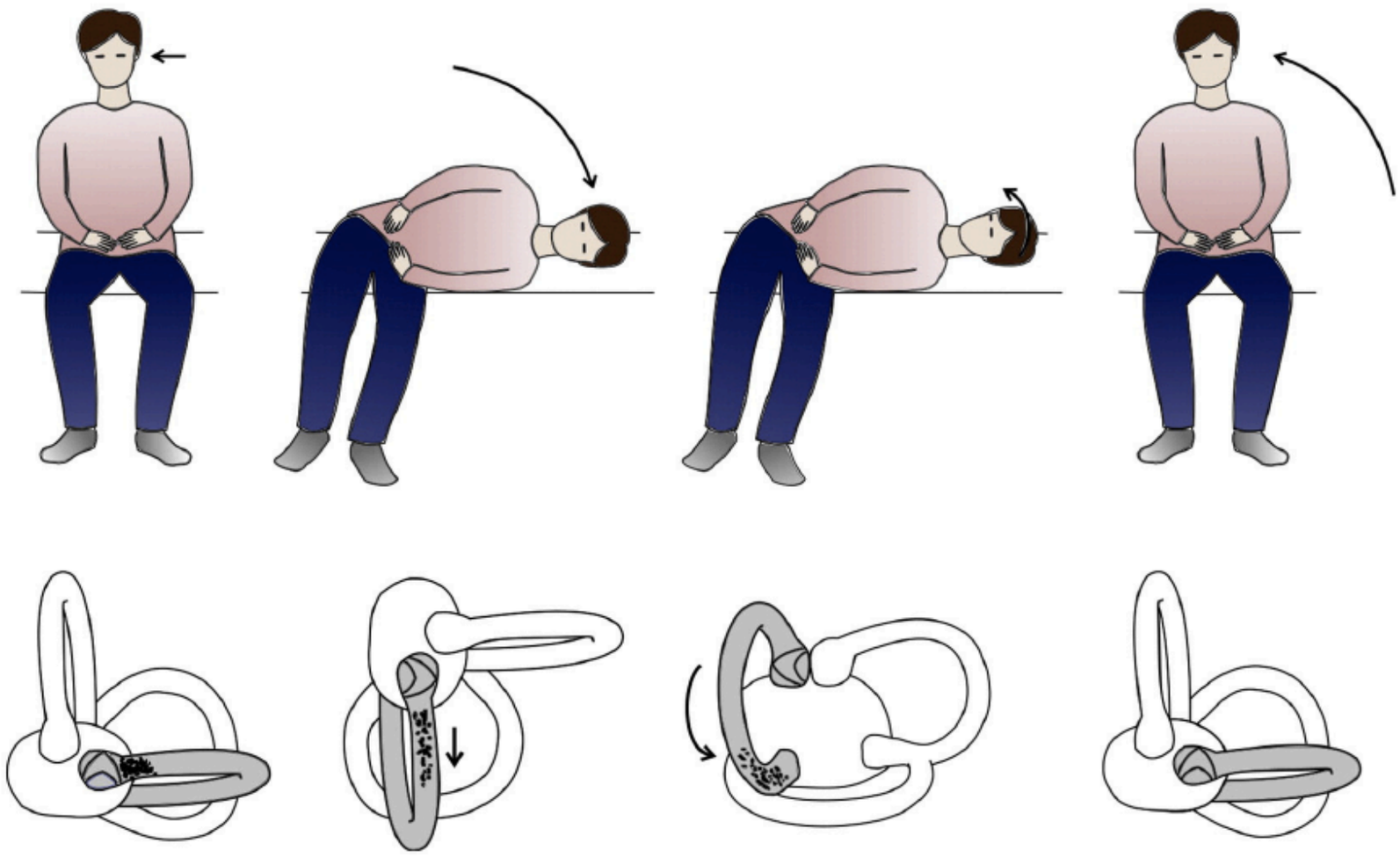
Apogeotropic Ny in HSC BPPV

- the intensity of the Ny is the guide to the side affected by BPPV

Head Yaw Test
McClure-Pagnini Test
Supine Roll Test

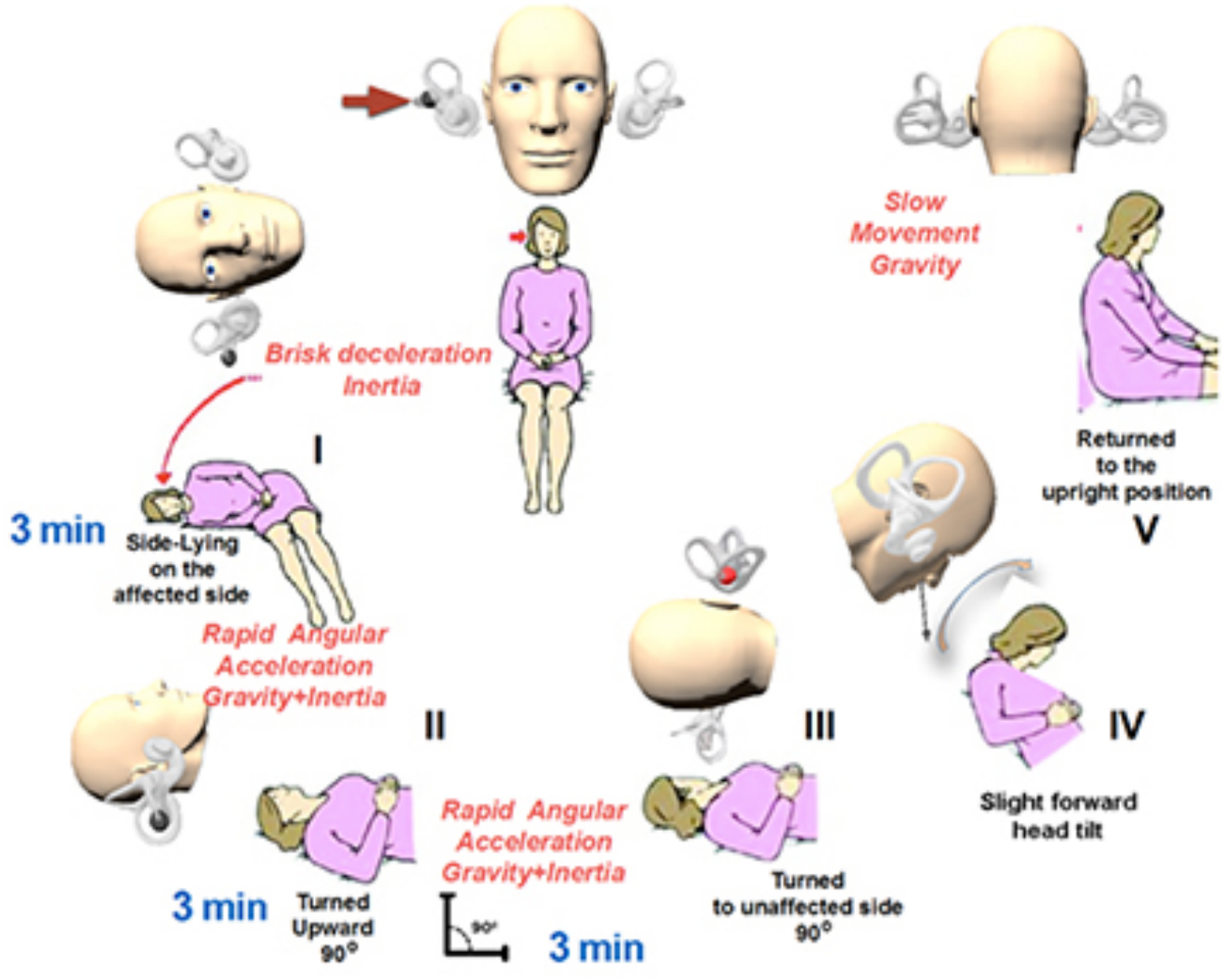


Treatment of Apogeotropic Ny in HSC BPPV



Appiani-Gufoni Maneuver

Treatment of Apogeotropic Ny in HSC BPPV



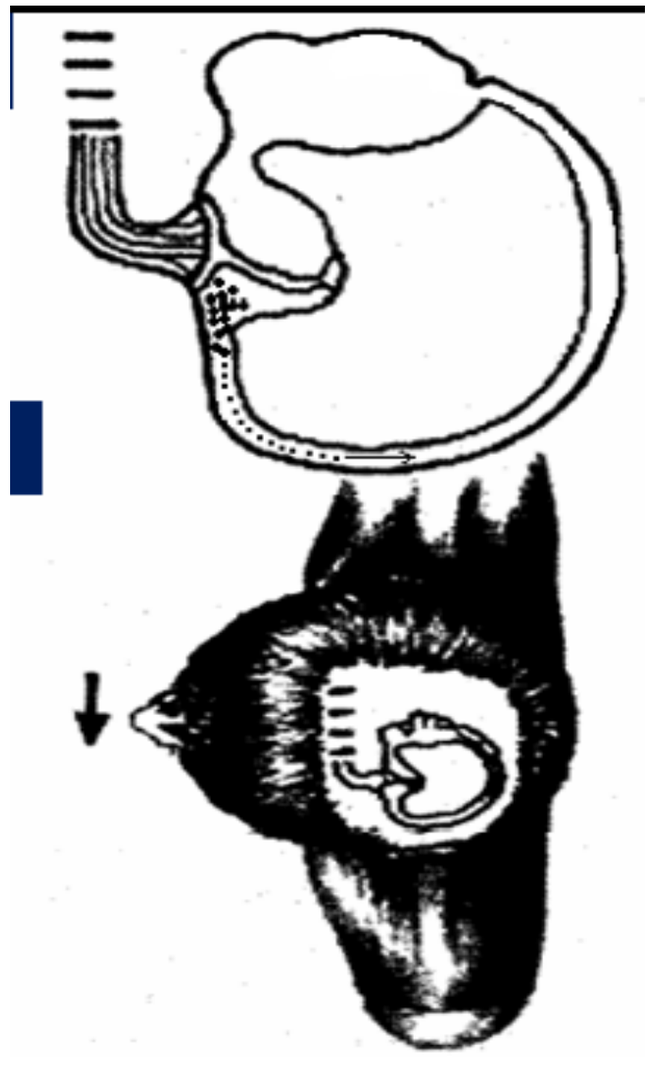
Zuma e Maia Maneuver

Treatment of Apogeotropic Ny in HSC BPPV

- the patient stay (sleep) on the affected side for 24-48 hours

- the apogeotropic Ny should be transformed into geotropic type

- then change the forced position to the other side or perform a proper maneuver for geotropic HSC BPPV



Forced Prolonged Position by Vannucchi

- left pseudospontaneous Ny

- left Ny in lean position, reduced right Ny in bow position

- apogeotropic Ny in head yaw test

- less intense toward left side

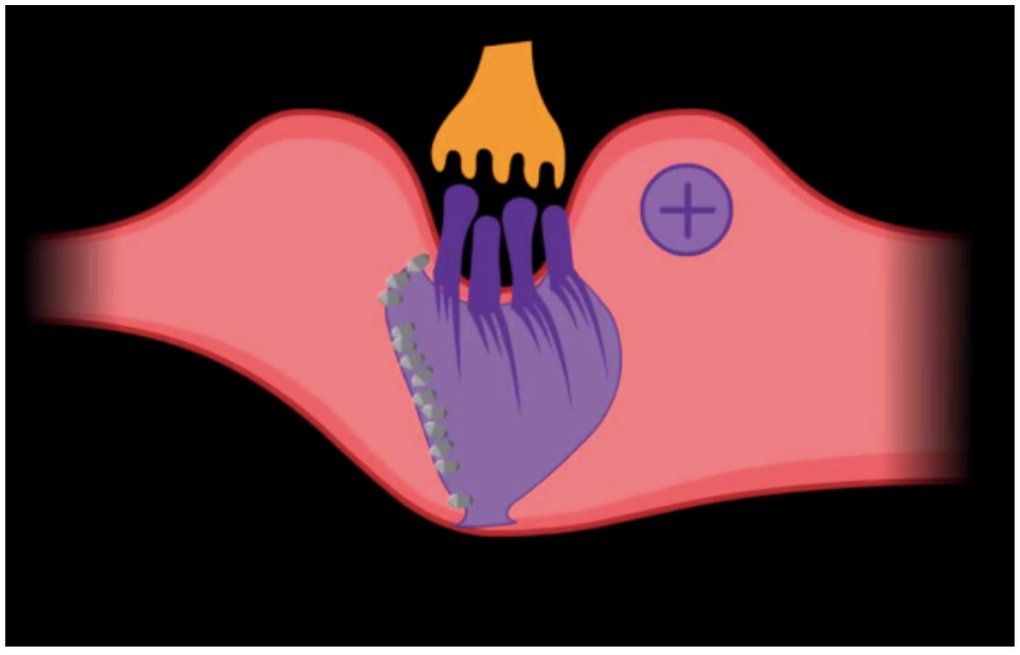
Apogeotropic persistent Ny: cupulolithiasis

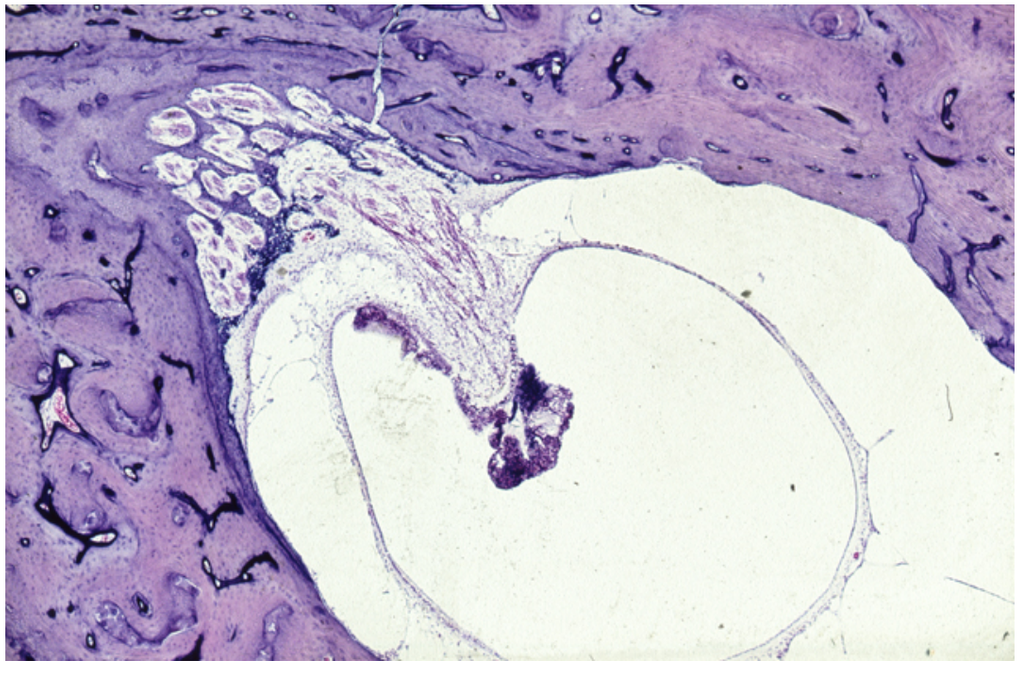
- symptoms generally well tolerated , without violent vertigo, but with dizziness while upright

- head roll test is performed inducing poor or no neurovegetative symptoms

- liberatory maneuver usually resolves Ny and symptoms either previously transforming it into a geotropic type or without conversion

- mastoid vibrator enhance the effectiveness of the maneuver





Apogeotropic persistent Ny: heavy cupula

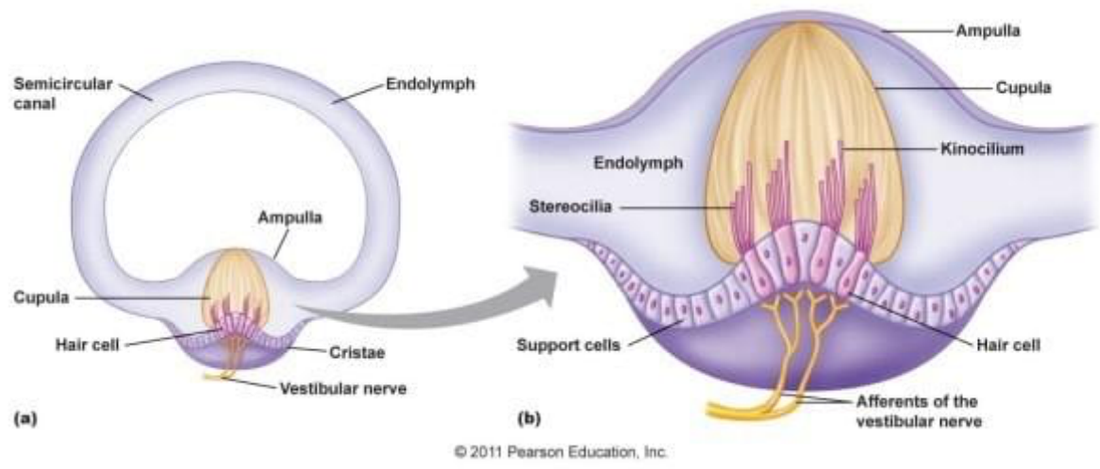
- patient history of family history
  often positive for migraine

- sudden and abrupt onset of
  symptoms for which the patients
  search for immediate visit

- vertigo poor tolerated and intense
  neurovegetative accompanying
  symptoms

- maneuvers absolutely inefficient to
  solve the vertigo and the
  nystagmus

- mannitol 18% solve the Ny and
  symptoms after 1 hour

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Apogeotropic Ny in HSC BPPV

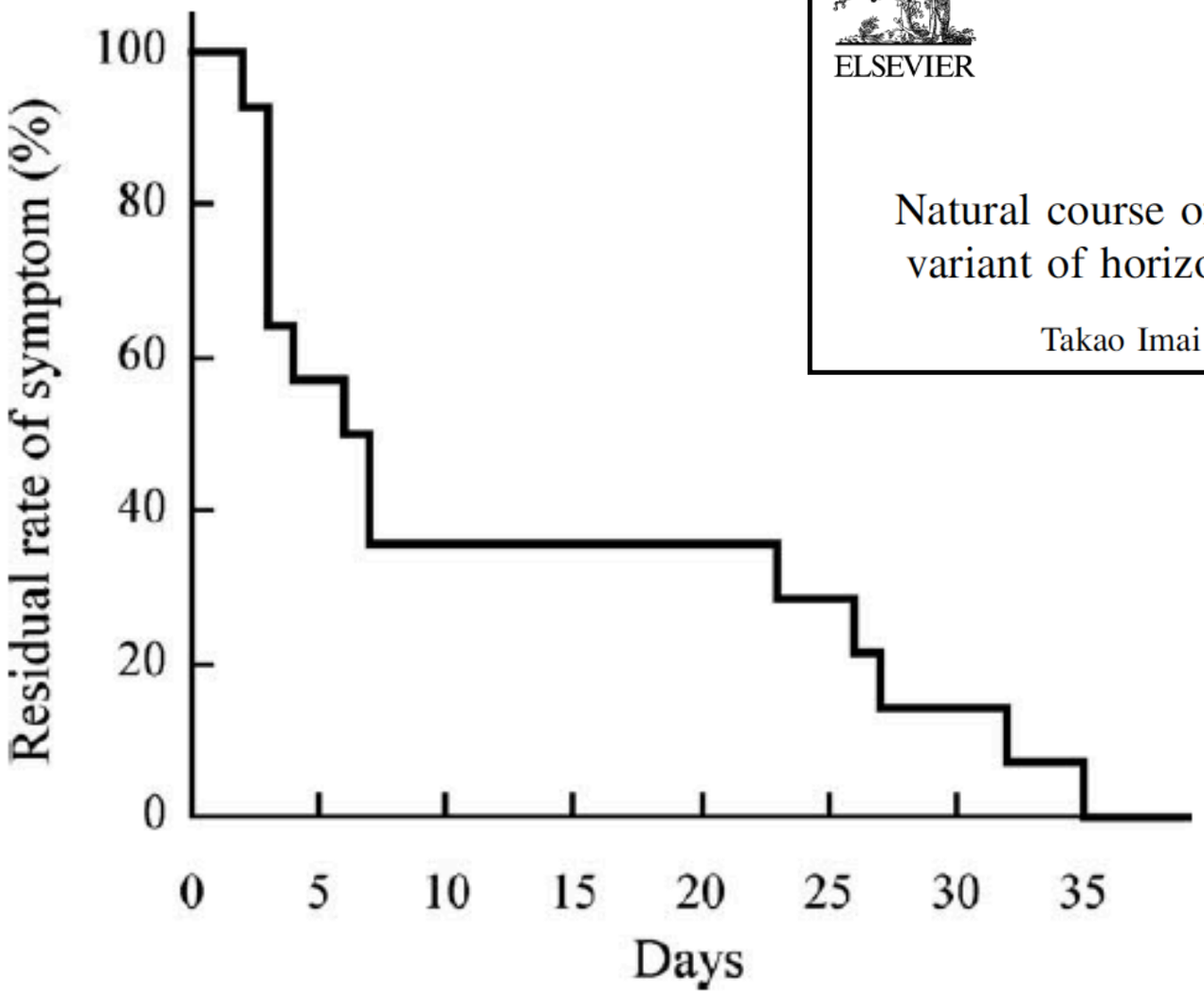


Fig. 1. Time course of positional vertigo after the onset without physiotherapy in patients with AH-BPPV was calculated using Kaplan–Meier method.

ELSEVIER

Auris Nasus Larynx 38 (2011) 2–5

AURIS NASUS LARYNX
INTERNATIONAL JOURNAL OF ORL & HNS

www.elsevier.com/locate/anl

Natural course of positional vertigo in patients with apogeotropic variant of horizontal canal benign paroxysmal positional vertigo

Takao Imai [a,*], Noriaki Takeda [b], Mahito Ito [c], Hidenori Inohara [a]

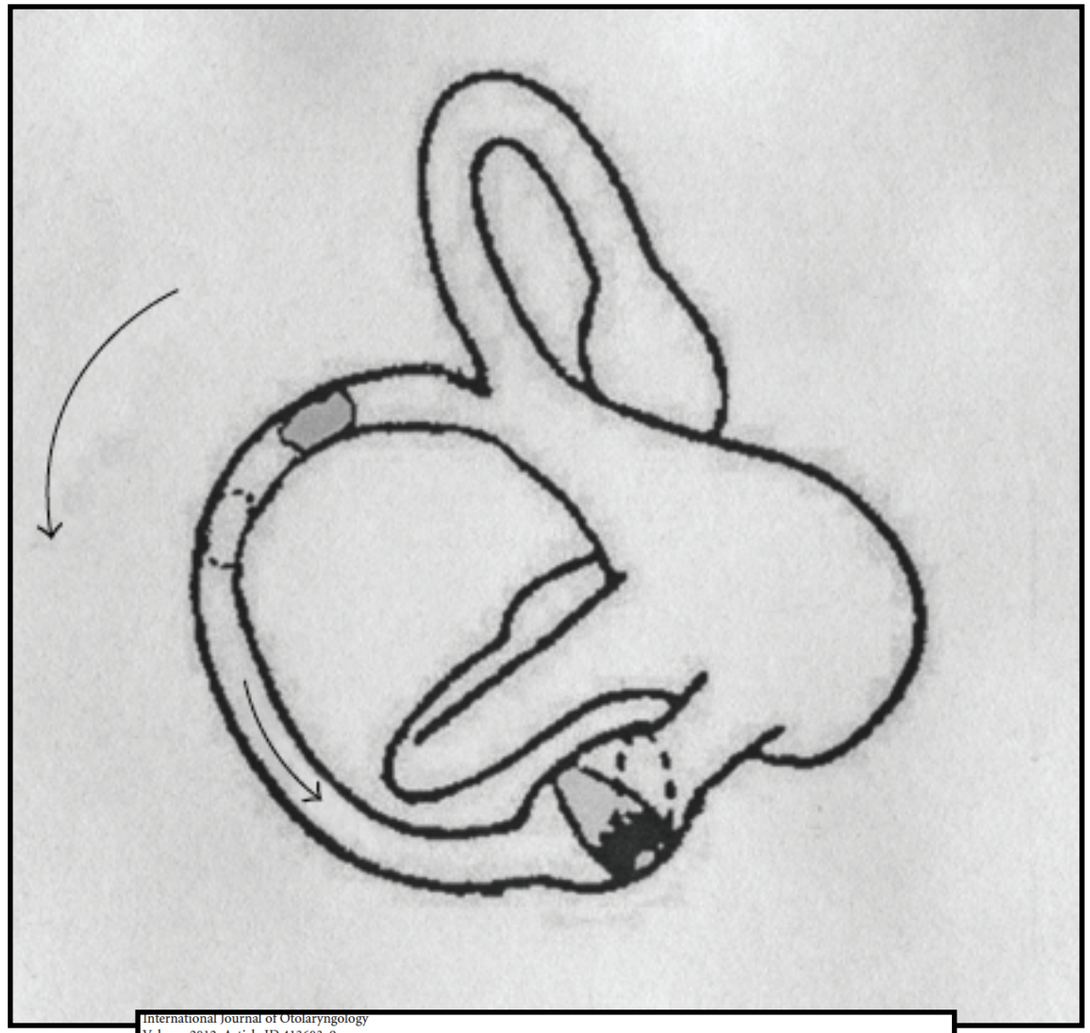
Apogeotropic Ny in PSC BPPV

- ampullipetal movement of otolith (thus endolymph) in same side Dix-Hallipike position

- inhibition of the PSC canal with prevalence of the contralateral one

- Apogeotropic PSC BPPV could mimic a contralateral SSC BPPV (very rare)

- may be evoked in different head positions



International Journal of Otolaryngology
Volume 2012, Article ID 413603, 9 pages
doi:10.1155/2012/413603

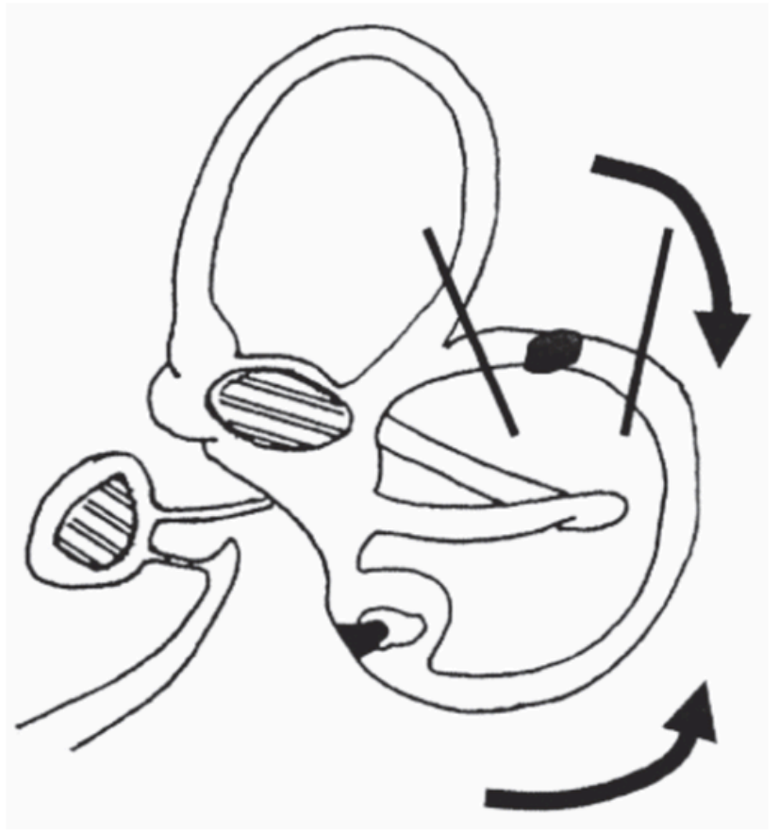
Clinical Study

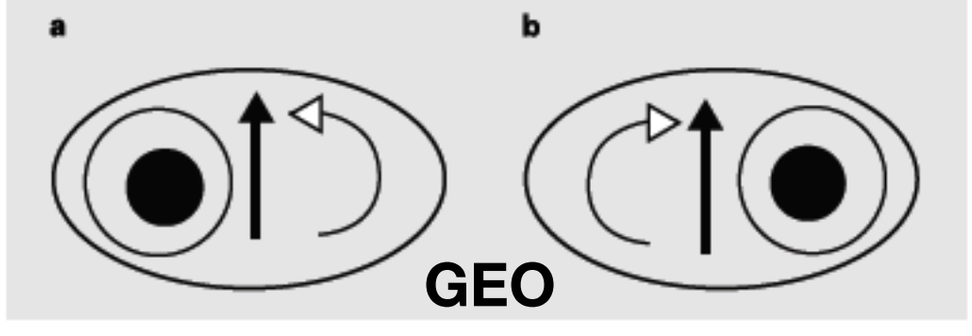
Posterior Semicircular Canal Benign Paroxysmal Positional Vertigo Presenting with Torsional Downbeating Nystagmus: An Apogeotropic Variant

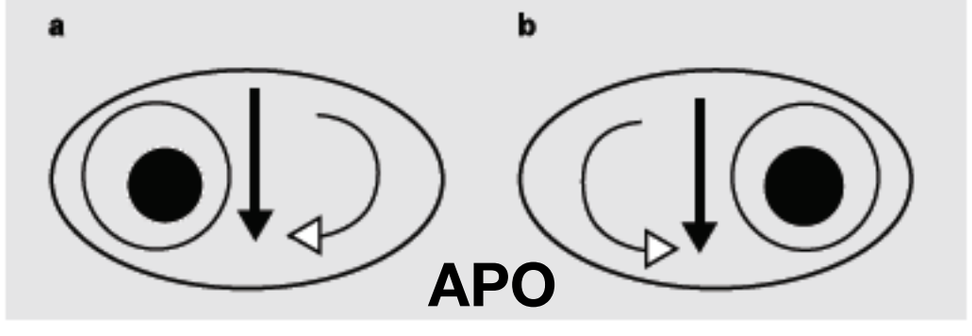
Paolo Vannucchi, Rudi Pecci, and Beatrice Giannoni

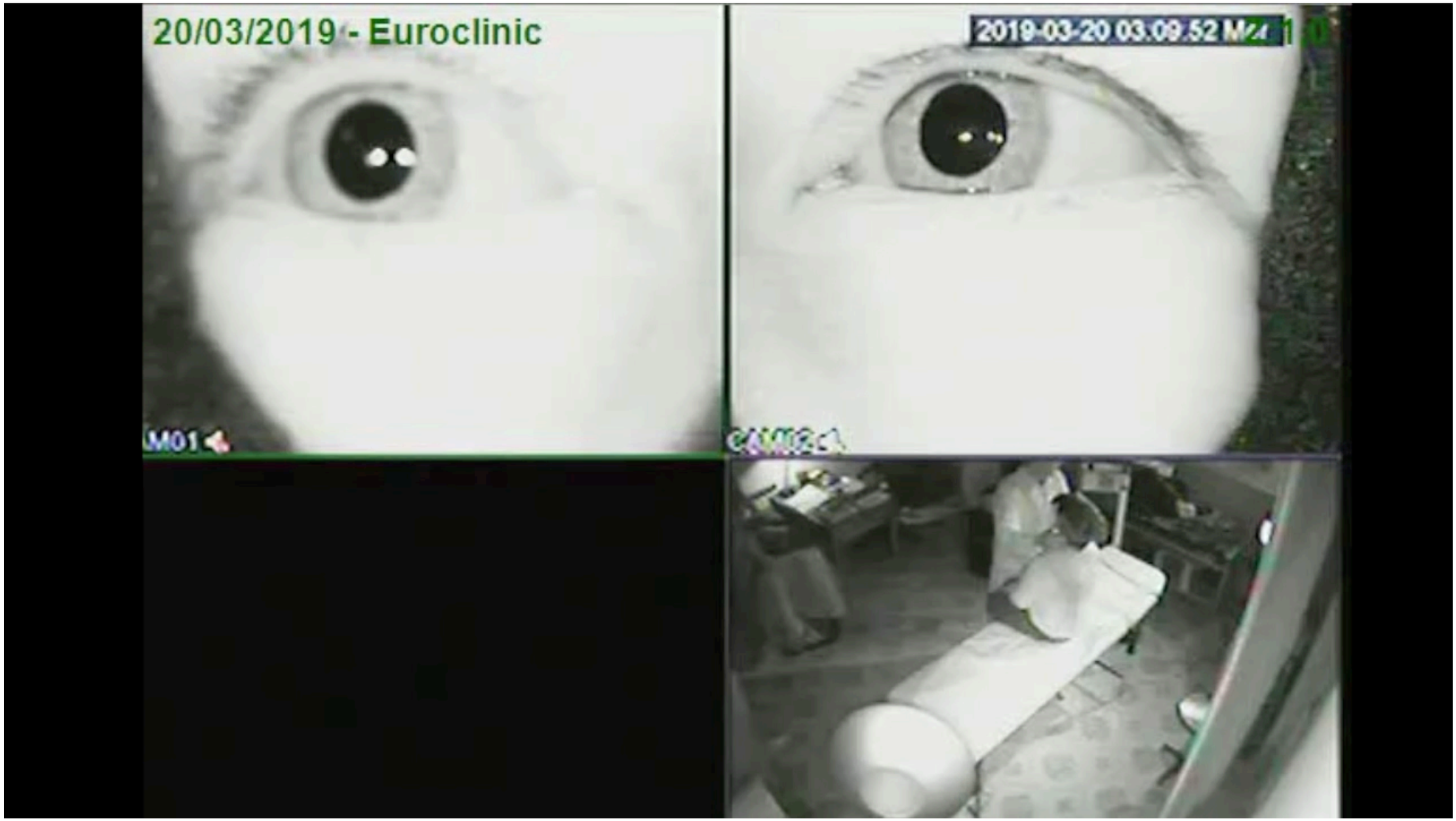
Apogeotropic Ny in PSC BPPV

- not (or reduced) latency
- not fatiguable
- less intense and longer than usual and sometimes not completely exhaustible
- Ny doesn’t reverse in sitting position after Dix-Hallpike





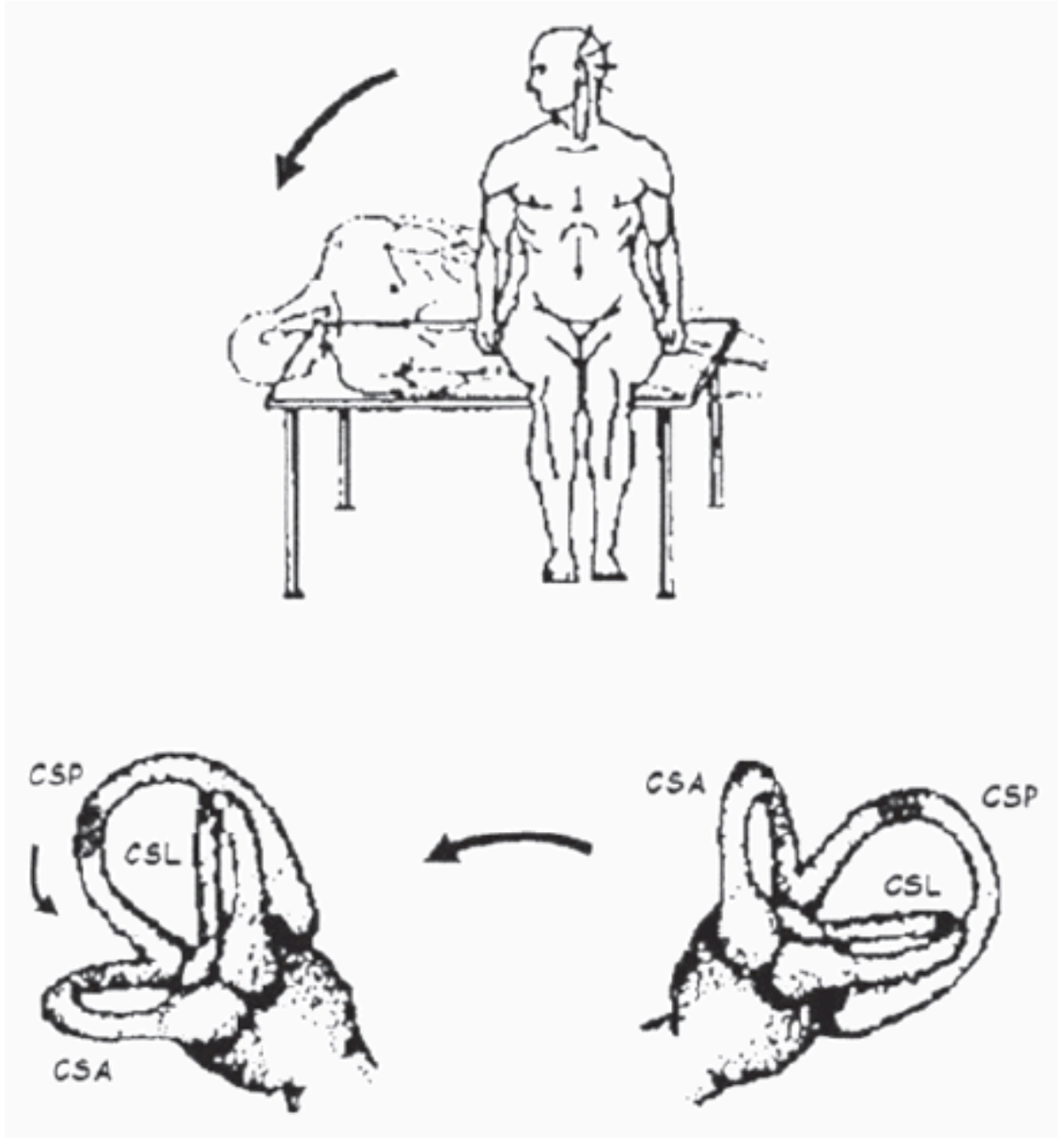


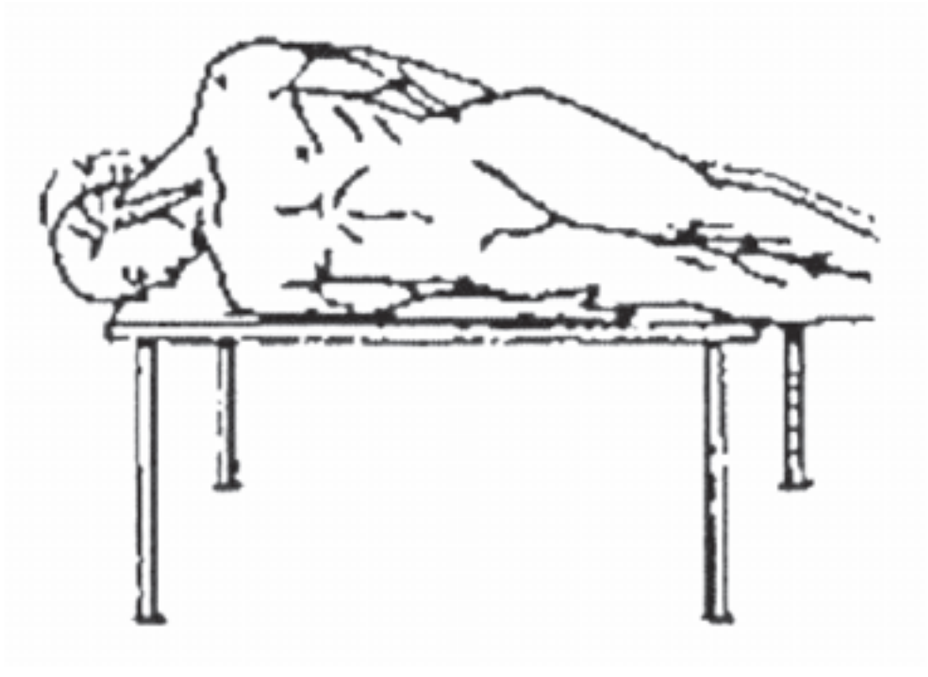

20/03/2019 - Euroclinic
2019-03-20 03.09.52 MA

Apogeotropic Ny in PSC BPPV

- treatment with so called “**Demi-Semont**” maneuver

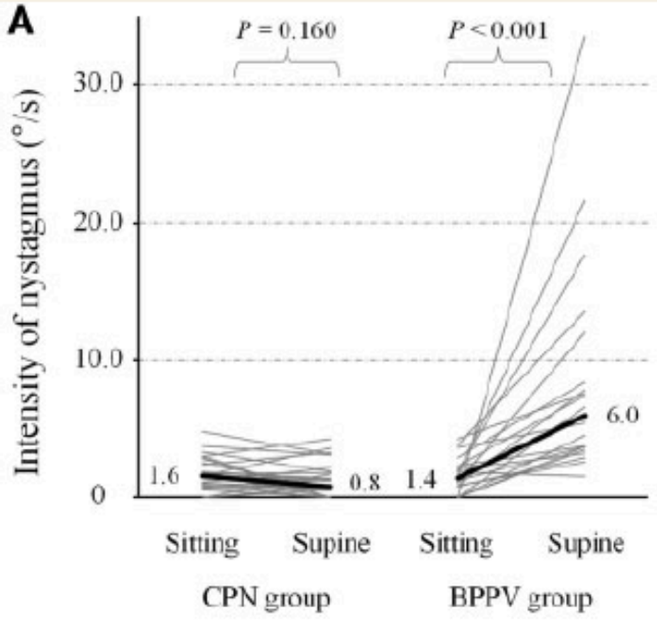
- **45° Forced Prolonged Position** maintained for 8 hours, so it is a home treatment

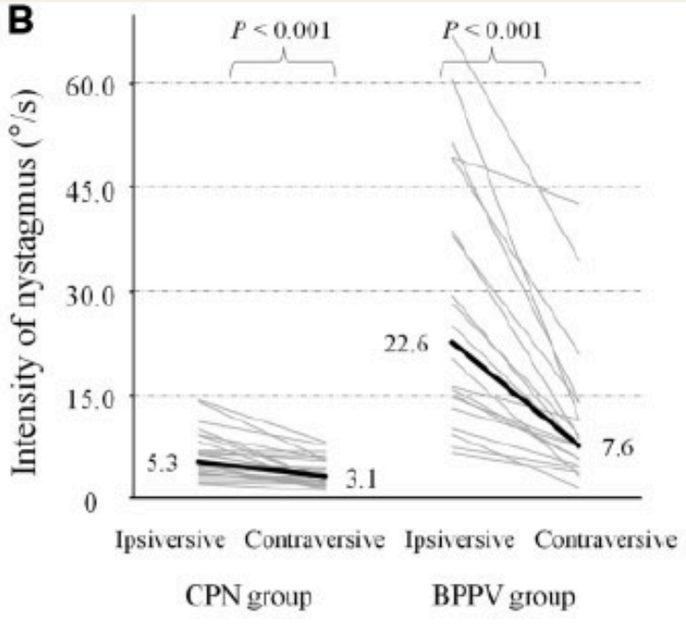


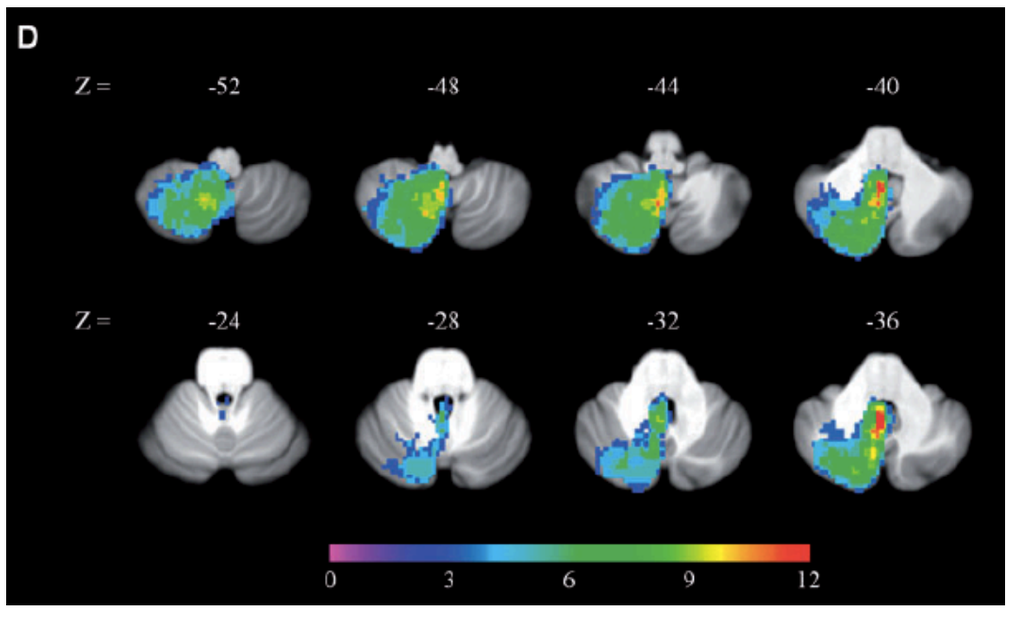


Attention to intractable apogeotropic Ny!

- presence of other neurological symptoms
- few modifications of Ny in changing position
- unresponsive to several maneuver
- perverted head shaking nystagmus
- hypermetric saccades





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Conclusions

- Apogeotropic Nystagmus in BPPV is a less frequent finding

- The management is not always simple as the more common presentation

- keep attention to intractable nystagmus, RMN could be necessary

San Giovanni degli Eremiti Church, Palermo

“Thank you”.

- Francesco Dispenza

Alexander’s law

the slow-phase velocity of the spontaneous nystagmus increases as gaze moves in the direction of the fast phase

1. the fast phase is directed toward the prevalent ear

2. nystagmus is greater when the gaze is directed toward the prevalent ear

3. spontaneous nystagmus with central gaze is augmented when vision is denied

GUSTAV ALEXANDER (1873-1932)
Master and Pioneer in Otology