academia

WEBINAR



# Bascule maneuver for the management of atypical posterior canal BPPV

SPEAKER

**Dr. A. Castellucci**

**26 NOVEMBER 2025**

9 am PST • 6 pm CET • 10:30 pm IST • 27 Nov. 1 am CST

60 min. • English


Andrea Castellucci, MD

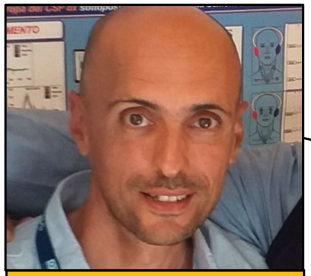
ENT Unit
Department of Surgery
Arcispedale Santa Maria Nuova
AUSL – IRCCS di Reggio Emilia
ITALY


VIS Vestibology • Italian Society
Società Italiana di Vestibologia

ROBERT BÁRÁNY • NAT. MDCCCLXXVII CB. MCMXXXVI •

AV AVISA
Audiology-Vestibular International Science Academy

# Acknowledgements



P. Malara, AuD



R. Pecci, MD



S. Martellucci, MD, PhD



A. Castellucci, MD



P. Russo, MD



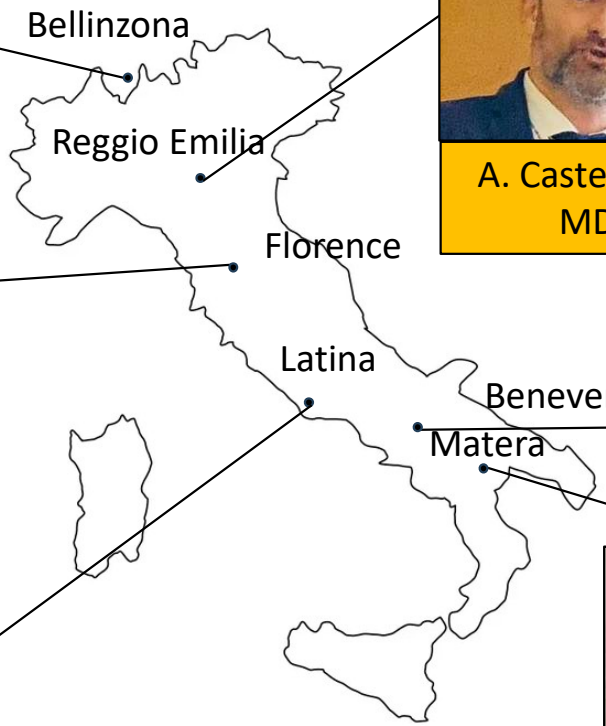
S. Donvito, MD



L. Califano, MD



G. Asprella Libonati, MD



# PC BPPV

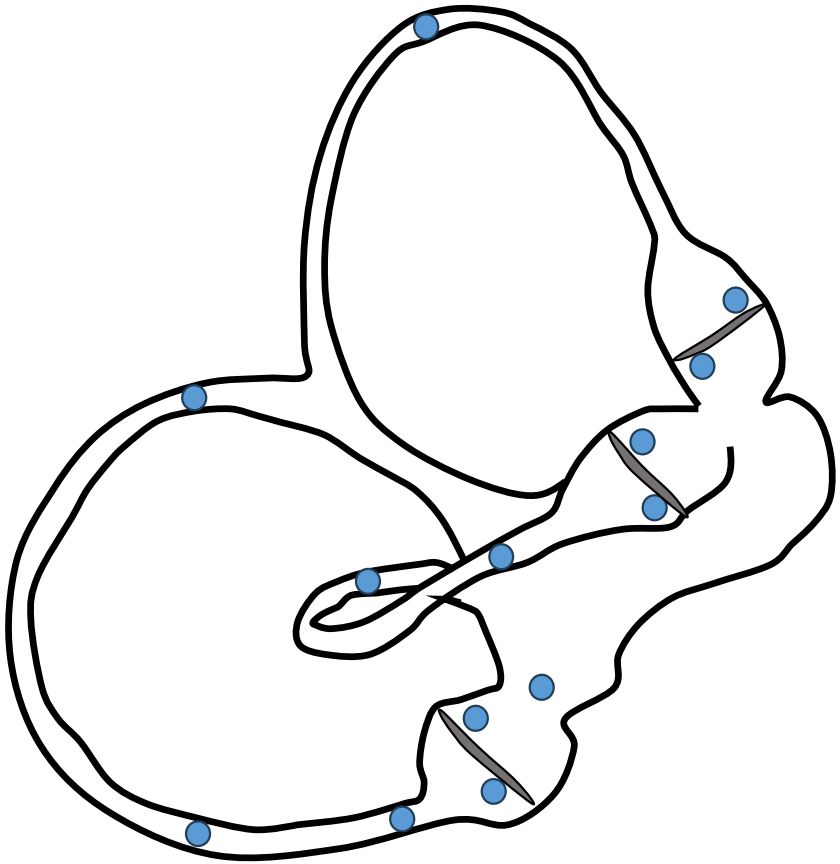
Journal of Vestibular Research 25 (2015) 105–117
DOI 10.3233/VES-150553
IOS Press

## Benign paroxysmal positional vertigo: Diagnostic criteria

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

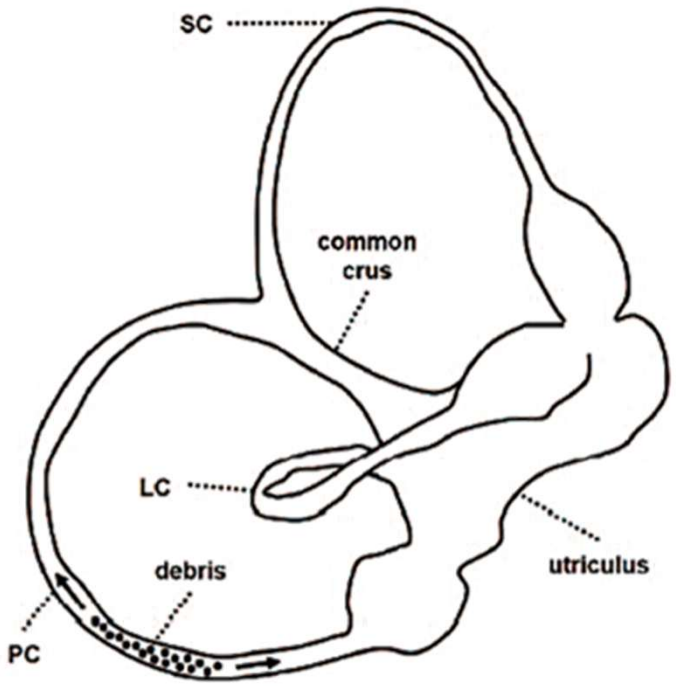
**A common disorder is not an easy disorder**

- **Common variants**
  - PC BPPV (geotropic variant)
  - HC BPPV (geotropic and apogeotropic variant)
  - HC cupulolithiasis
- **«Atypical variants»**
  - PC cupulolithiasis
  - BPPV associated to positional down-beating ny
    - AC BPPV
    - Apogeotropic variant of PC BPPV
  - Sitting up vertigo
  - Canalith Jam
- **Multicanal BPPV**



# PC BPPV

- **Typical PC-BPPV** is successfully managed with **standard CRM** with high success rate



# PC BPPV

- **Canalolithiasis:** otoconia are free to float back and forth along the canal
  → **paroxysmal direction-changing nystagmus**
  - **Epley maneuver**



The canalith repositioning procedure: For treatment of benign paroxysmal positional vertigo

JOHN M. EPLEY, MD, Portland, Oregon



# PC BPPV

- **Canalolithiasis:** otoconia are free to float back and forth along the canal
  → **paroxysmal direction-changing nystagmus**

  - **Semont maneuver**

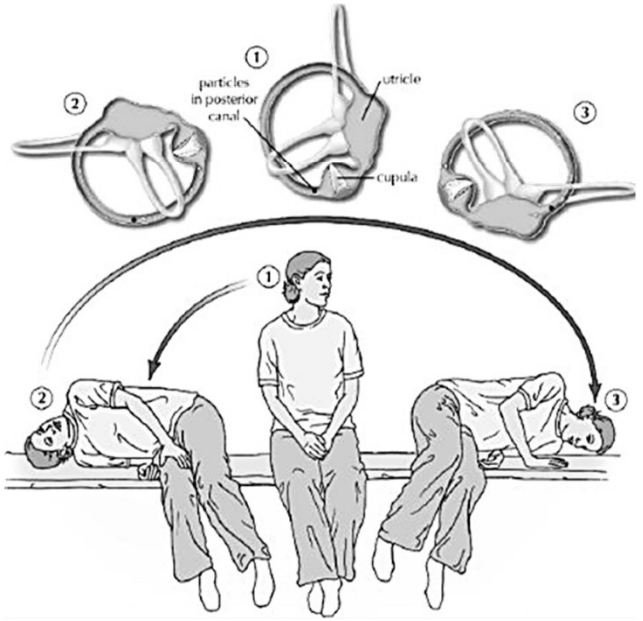


Adv. Oto-Rhino-Laryng., vol. 42, pp. 290–293 (Karger, Basel 1988)

## Curing the BPPV with a Liberatory Maneuver

*A. Semont*[a], *G. Freyss*[b], *E. Vitte*[b]

[a]Vestibular Rehabilitation and [b]ENT Department, Hôpital Lariboisière, Paris, France



# Prognostic signs during CRM in PC BPPV

## Benign Paroxysmal Positional Vertigo and Positional Vertigo Variants

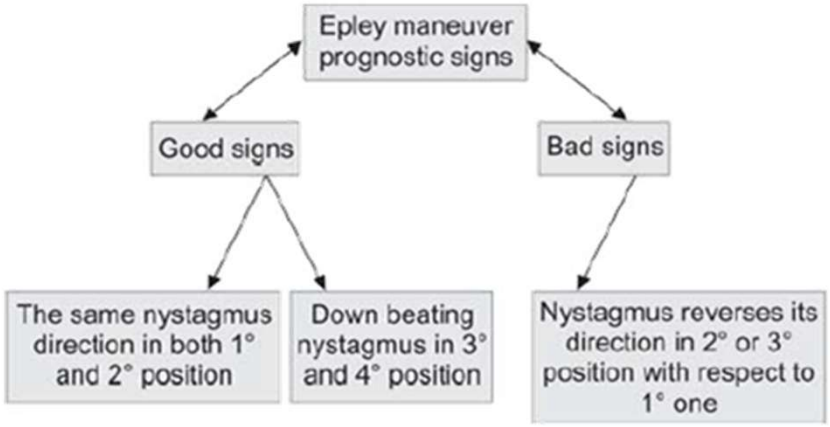
Giacinto Asprella Libonati

ABSTRACT

This article reviews the causes of positional vertigo and positional nystagmus of peripheral origin. Benign paroxysmal positional vertigo is described in all its variants, its diagnosis and therapy are highlighted. In addition, nonparoxysmal positional vertigo and nystagmus due to light/heavy cupula of lateral and posterior semicircular canal is focused on. The differential diagnosis between positional vertigo due to otolithic and nonotolithic causes is discussed.

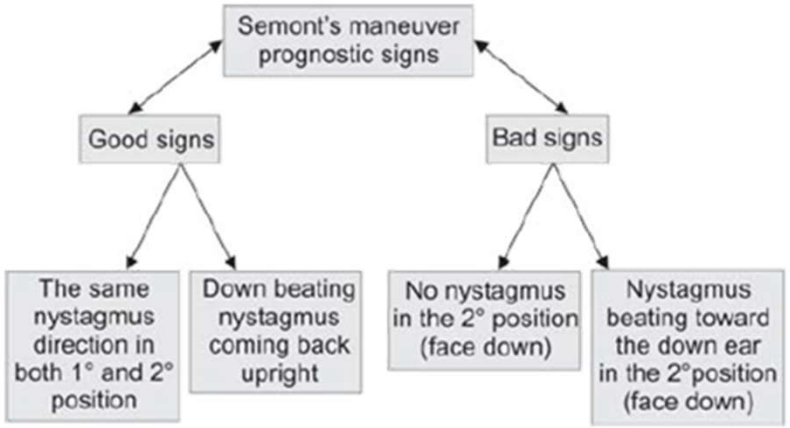
otoconial debris inside the semicircular canals—canalolithiasis, or attached to the ampullary cupula—cupulolithiasis. Both of the previous conditions transform the ampullary cupula of the involved canal from a detector of angular accelerations into a detector of liner accelerations, thus becoming gravity sensitive.

According to the canalolithiasis theory the otoconial conglomerate gravitates inside the canal because of head




**Flow Chart 1:** Nystagmus-based strategy performing the Epley maneuver

- A **nystagmus-guided approach in the treatment of BPPV** is pivotal in monitoring whether or not **ampullofugal progression of the debris in the canal** occurs by **observing the nystagmus evoked during each step of the liberatory technique**.




**Flow Chart 2:** Nystagmus-based strategy performing the Semont maneuver

# Prognostic signs during CRM in PC BPPV

HIGH LIGHT VIDEO

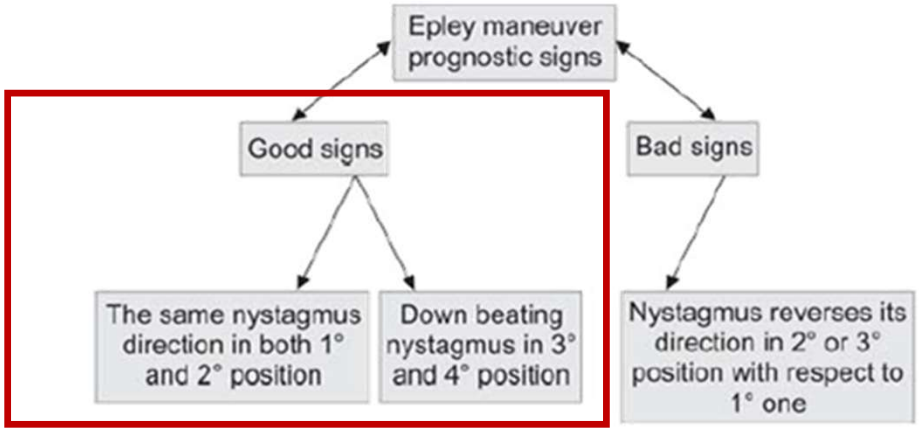
## Predicting a successful treatment in posterior canal benign paroxysmal positional vertigo

Hui Jong Oh, MD, PhD*; Ji Soo Kim, MD, PhD*; Byung In Han, MD; and Jeong Geun Lim, MD

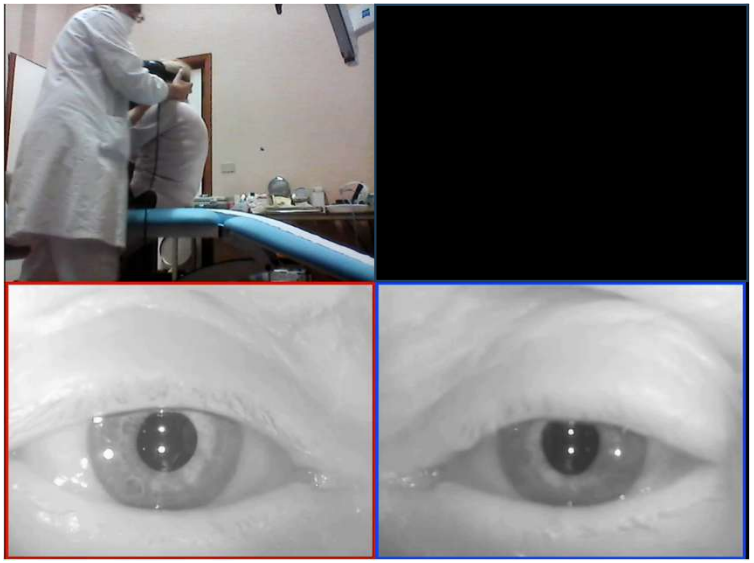
Orthotropic nystagmus in predicting the efficacy of treatment in posterior canal benign paroxysmal positional vertigo

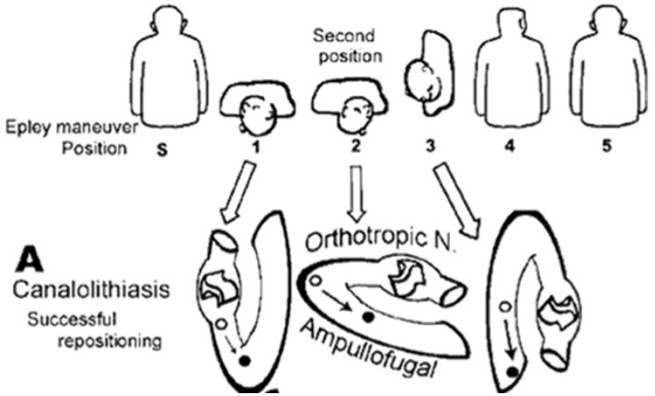
Yue Lou, Liangguo Xu, Yanwen Wang, Zexian Zhao, Xiaoli Liu, Yaguo Li*

*Department of Neurology, Zhejiang Hospital, Hangzhou 310013, China*




**Flow Chart 1:** Nystagmus-based strategy performing the Epley maneuver





# Prognostic signs during CRM in PC BPPV

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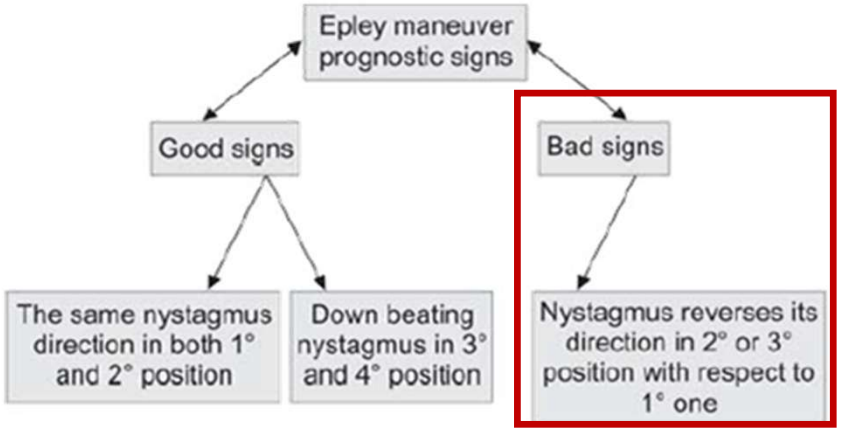
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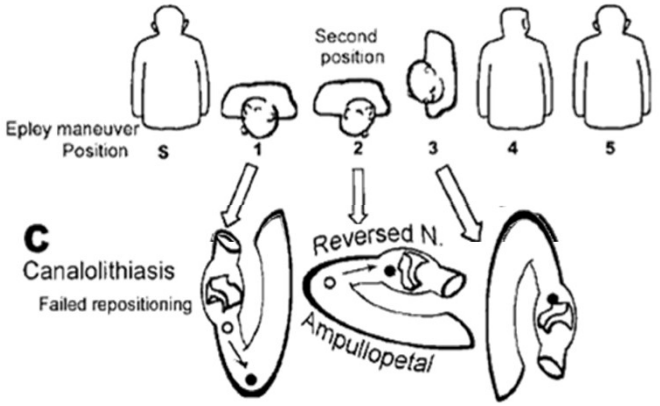
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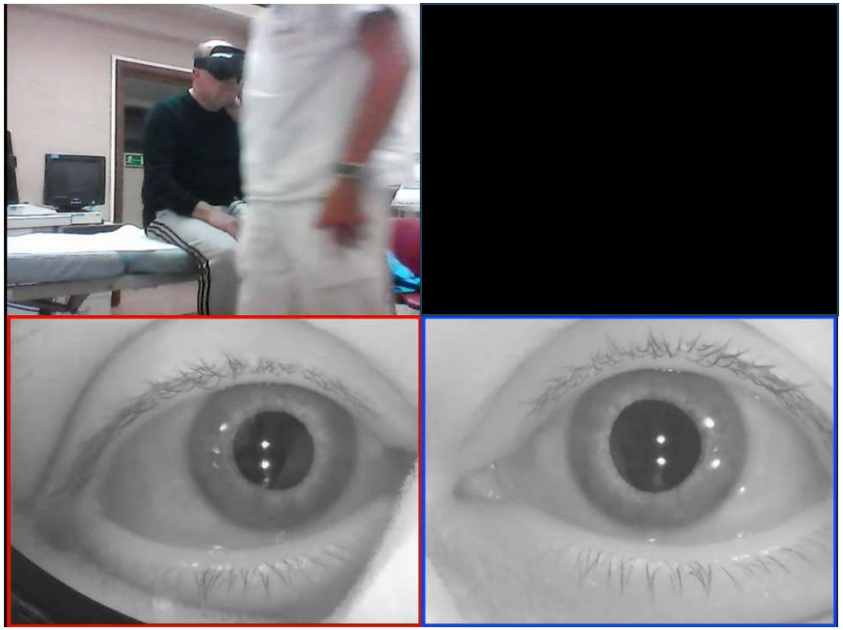


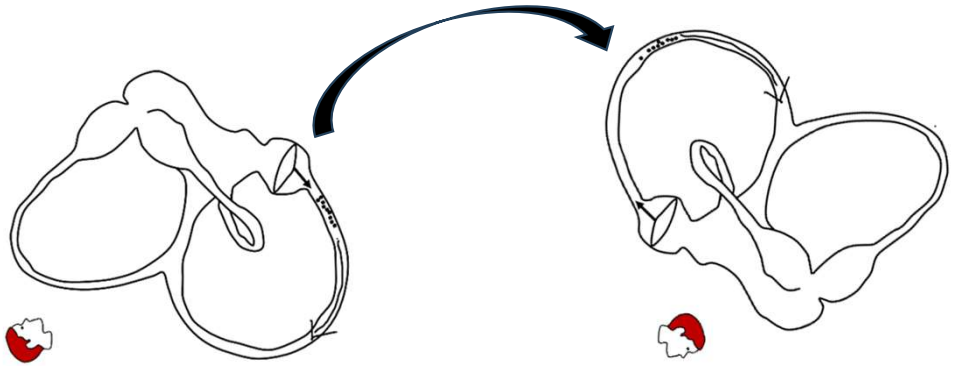

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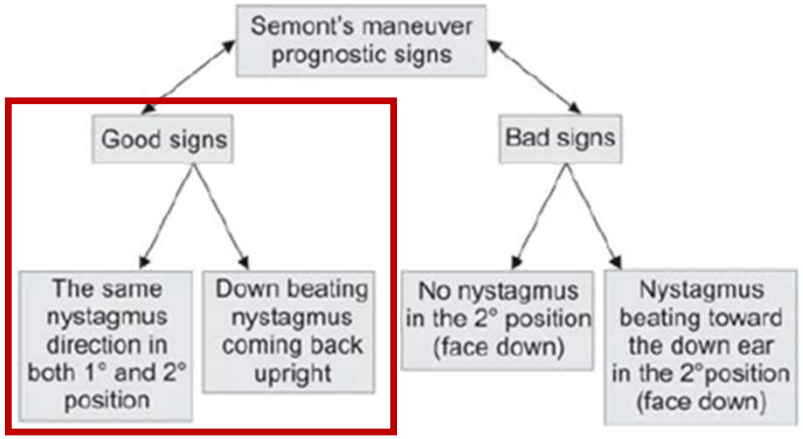
# Prognostic signs during CRM in PC BPPV





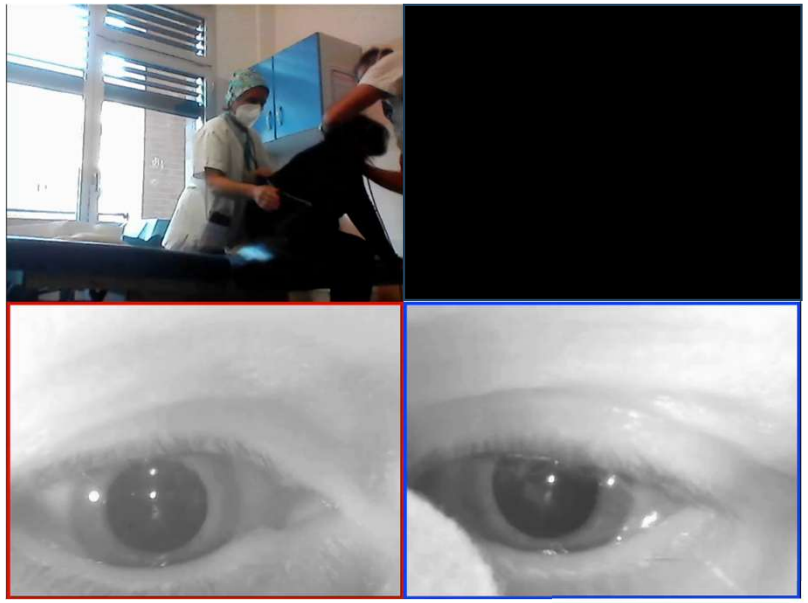
Can We Predict the Efficacy of the Semont Maneuver in the Treatment of Benign Paroxysmal Positional Vertigo of the Posterior Semicircular Canal?

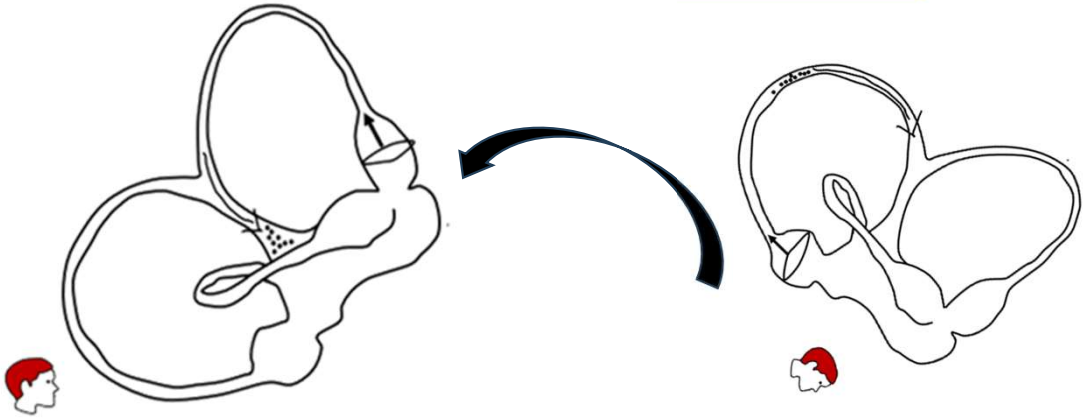
*†Andrés Soto-Varela, ‡Marcos Rossi-Izquierdo, and *†Sofía Santos-Pérez




**Flow Chart 2:** Nystagmus-based strategy performing the Semont maneuver

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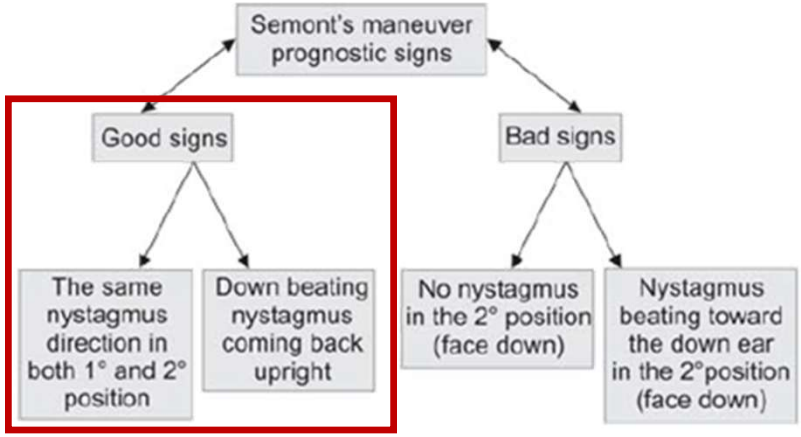




## Congruous Torsional Down Beating Nystagmus in the Third Position of the Semont's Maneuver in Patients Treated for Canalithiasis of Posterior Semicircular Canal Benign Paroxysmal Positional Vertigo: Its Significance and Prognostic Value

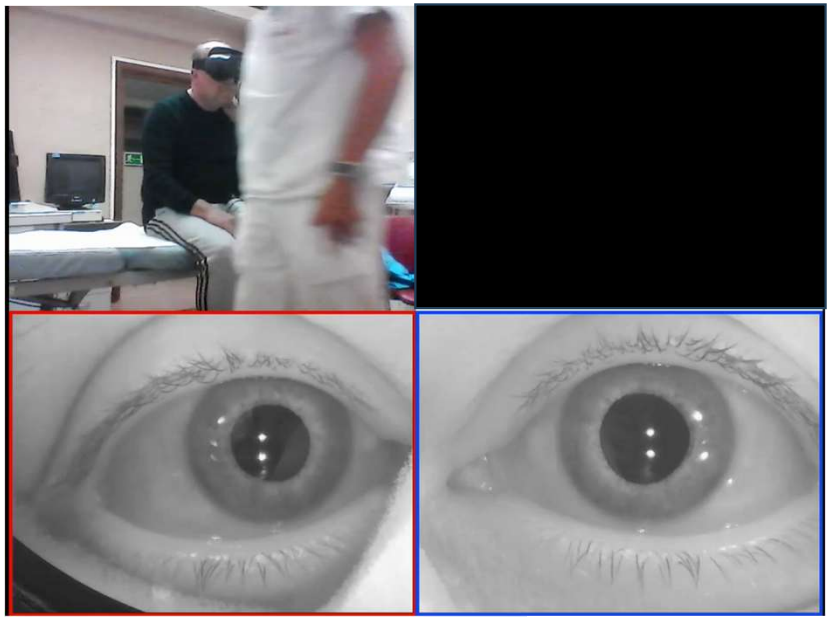
*Beatrice Giannoni[1,2*], Vincenzo Marcelli[3], Ilaria Verdolin[2], Curzio Checcucci[4], Federica Pollastri[2] and Rudi Pecci[2]*

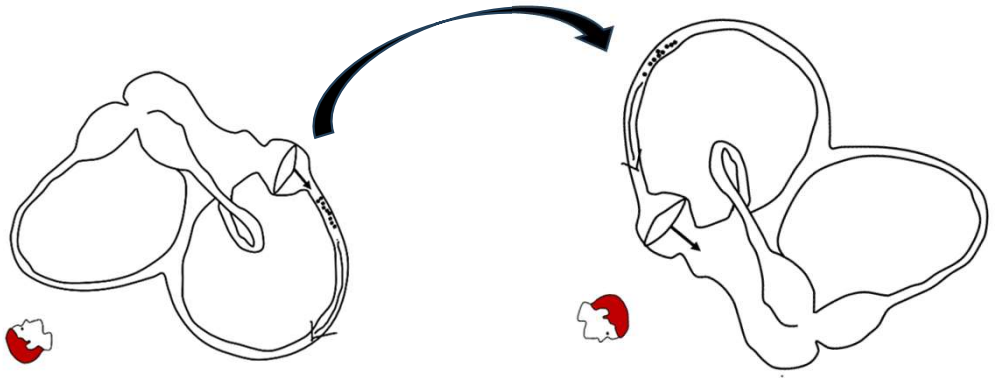
*[1] Department of Neuroscience, Psychology, Drug's Area and Child's Health, University of Florence, Florence, Italy, [2] Unit of Audiology Careggi University Hospital, Florence, Italy, [3] Neurotology Unit, Ospedale del Mare, Naples, Italy, [4] Department of Physics and Astronomy, University of Florence, Italy Careggi University Hospital, Florence, Italy*




**Flow Chart 2:** Nystagmus-based strategy performing the Semont maneuver

# Prognostic signs during CRM in PC BPPV





## Benign Paroxysmal Positional Vertigo and Positional Vertigo Variants

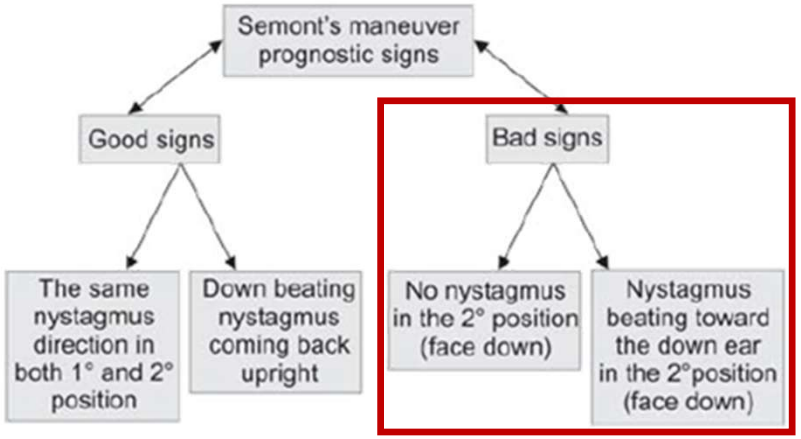
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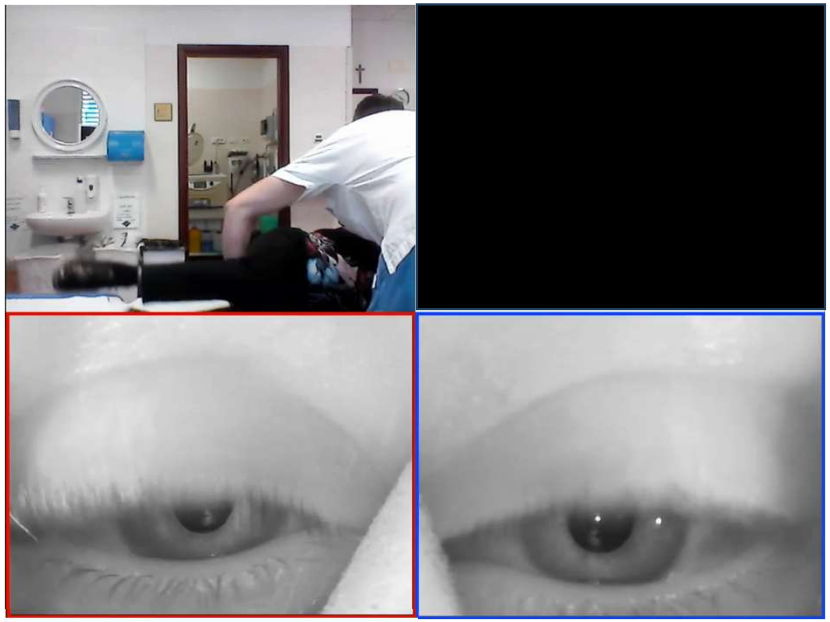
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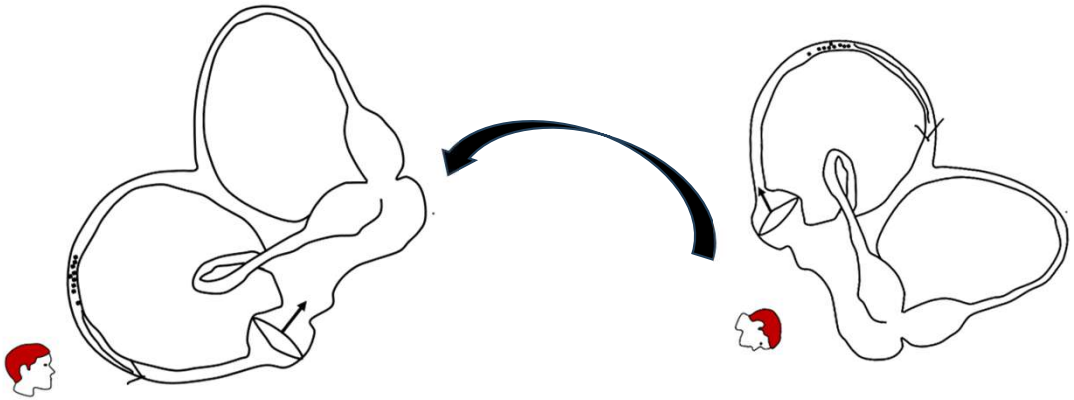
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**Flow Chart 2:** Nystagmus-based strategy performing the Semont maneuver

# Prognostic signs during CRM in PC BPPV



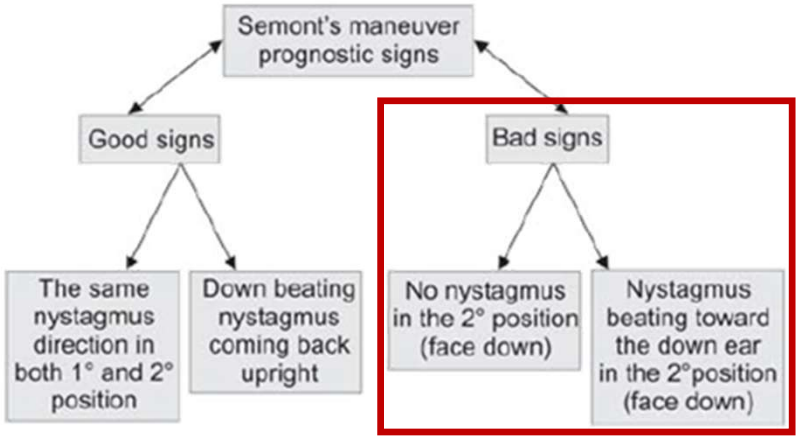


## Vertigo returning to the sitting position after the Semont manoeuvre. Is it a prognostic symptom?

*La comparsa di vertigine al ritorno nella posizione seduta della manovra di Semont può esser considerata un fattore prognostico?*

A. ALBERA[1], M. BOLDREGHINI[2], A. CANALE[2], R. ALBERA[2], C.F. GERVASIO[2]

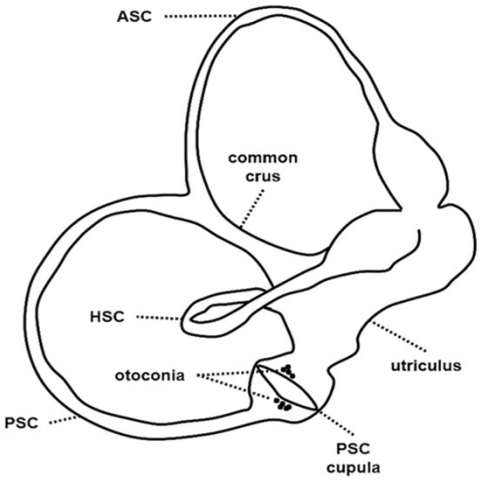
[1] Department of Otolaryngology, San Giuseppe Hospital, University of Milan, Italy; [2] Department of Surgical Sciences, Otolaryngology Unit, University of Turin, Italy



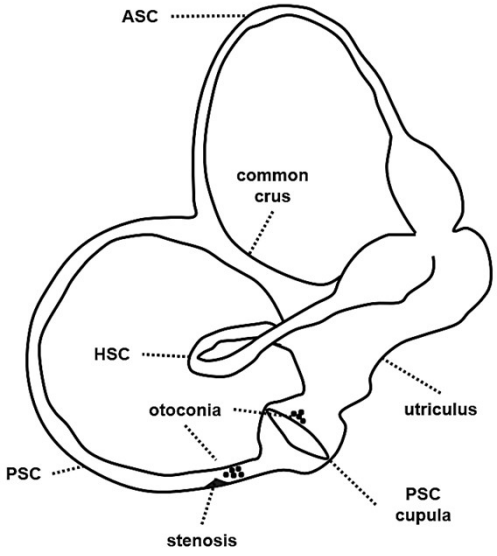

**Flow Chart 2:** Nystagmus-based strategy performing the Semont maneuver

# Atypical PC BPPV

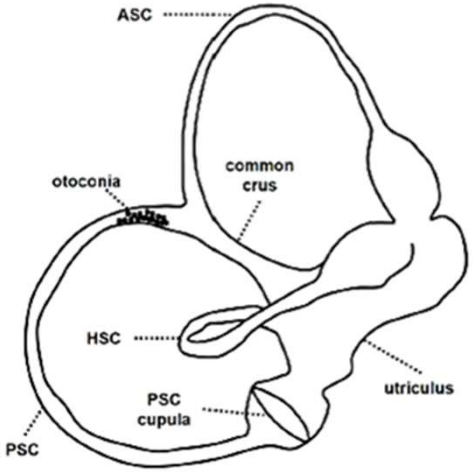
- **Atypical variants**, where **otoconia settle in uncommon/stenotic canal tracts** generating **unusual positional nystagmus**, are usually **refractory to standard CRM** and their management is still debated

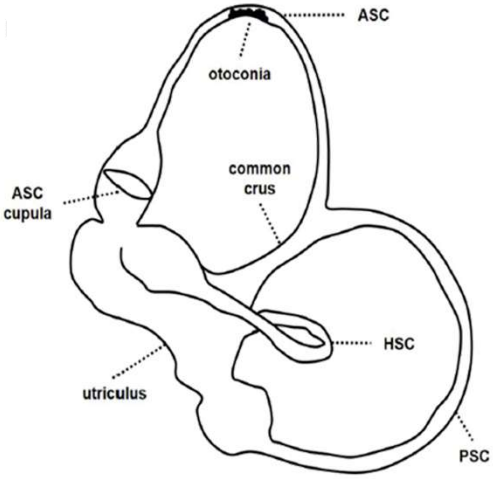



**PC cupulolithiasis**

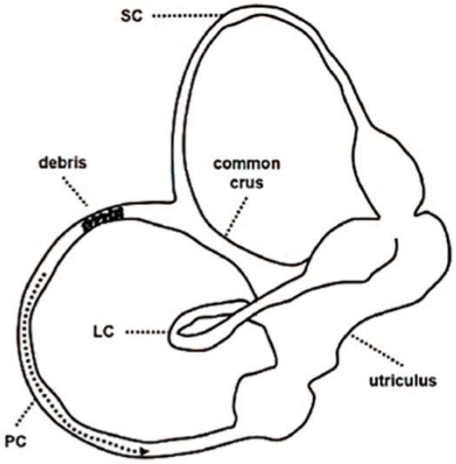



**sitting up vertigo**



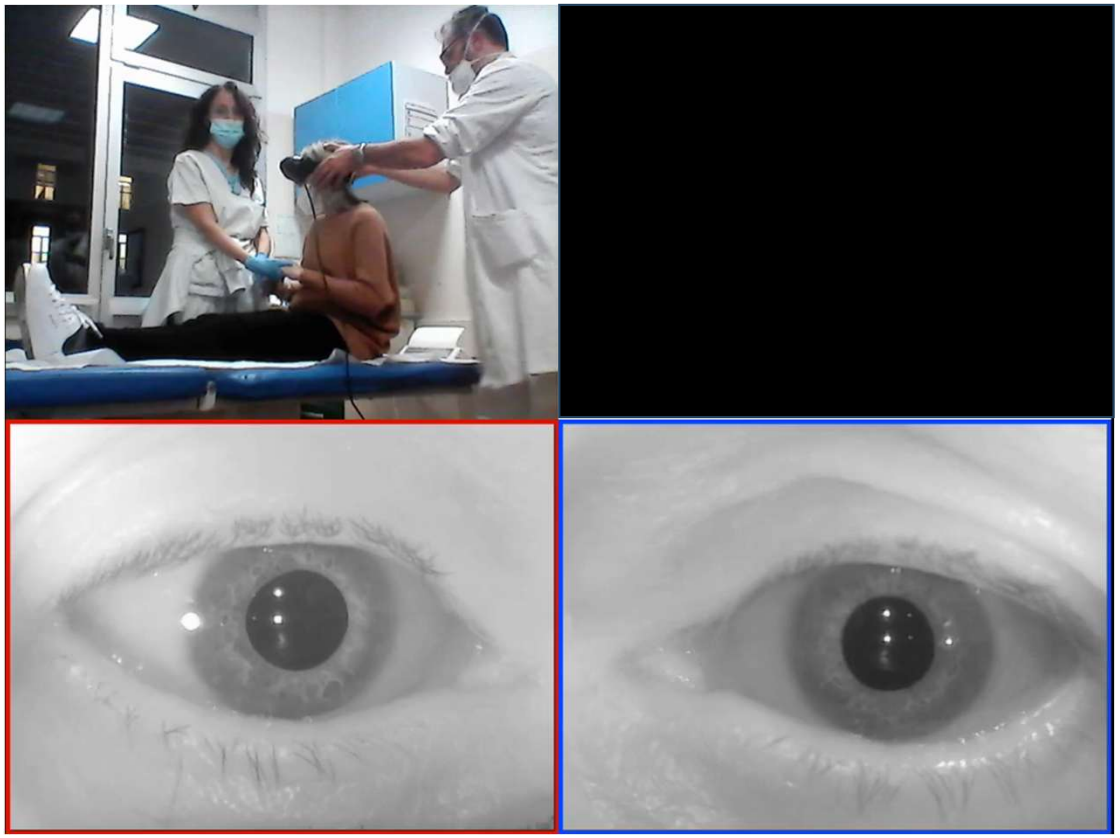

**BPPV with persistent pDBN**

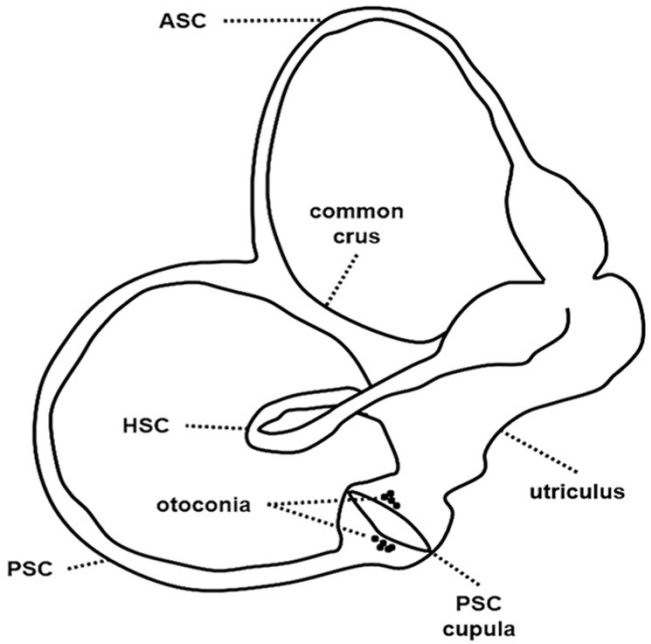



**PC canalith jam**

# PC cupulolithiasis

- Persistent upbeat/ipsilesional torsional nystagmus in provoking position (Dix Hallpike / Semont) or (better) at the half Hallpike test
- Reversed downbeat/contralesional torsional nystagmus in contralateral 45° face-down position





# PC cupulolithiasis

**3D analysis of benign positional nystagmus due to cupulolithiasis in posterior semicircular canal**

TAKAO IMAI[1,2], NORIAKI TAKEDA[3], MAHITO ITO[4], KAZUNORI SEKINE[3], GO SATO[3], YOSHIHIRO MIDOH[5], KOJI NAKAMAE[5] & TAKESHI KUBO[2]

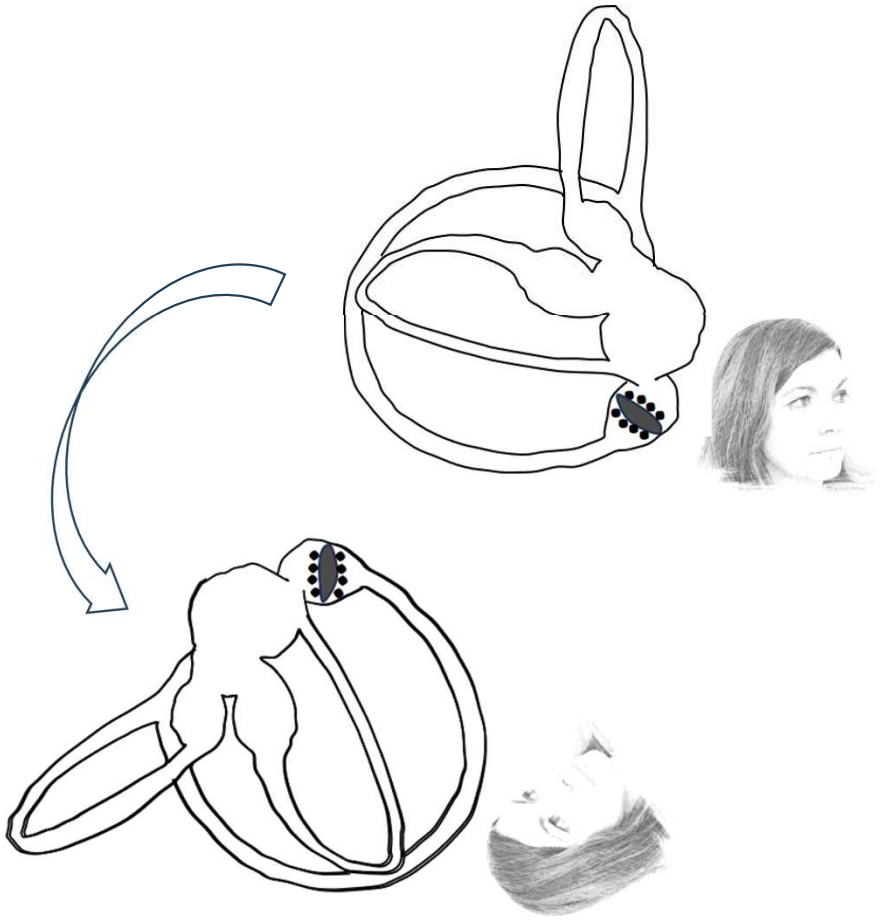
**Cupulolithiasis of the posterior semicircular canal**

*Hiroaki Ichijo, MD, PhD**

*Ichijo Ear, Nose and Throat Clinic, Hirosaki, Japan*

Retrospective analysis of nystagmus characteristics and clinical applications of positional testing in patients with cupulolithiasis of the posterior semicircular canal in benign paroxysmal positional vertigo

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**Dix Hallpike test**

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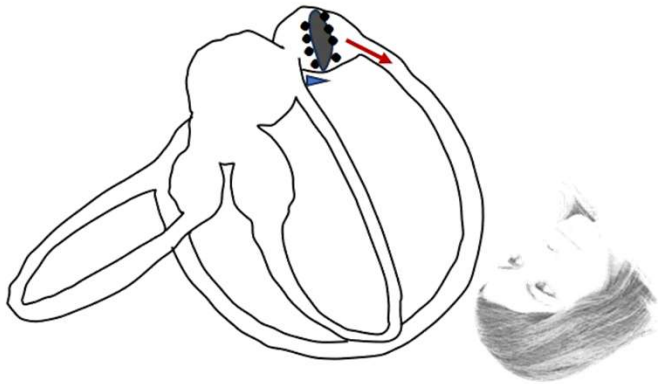
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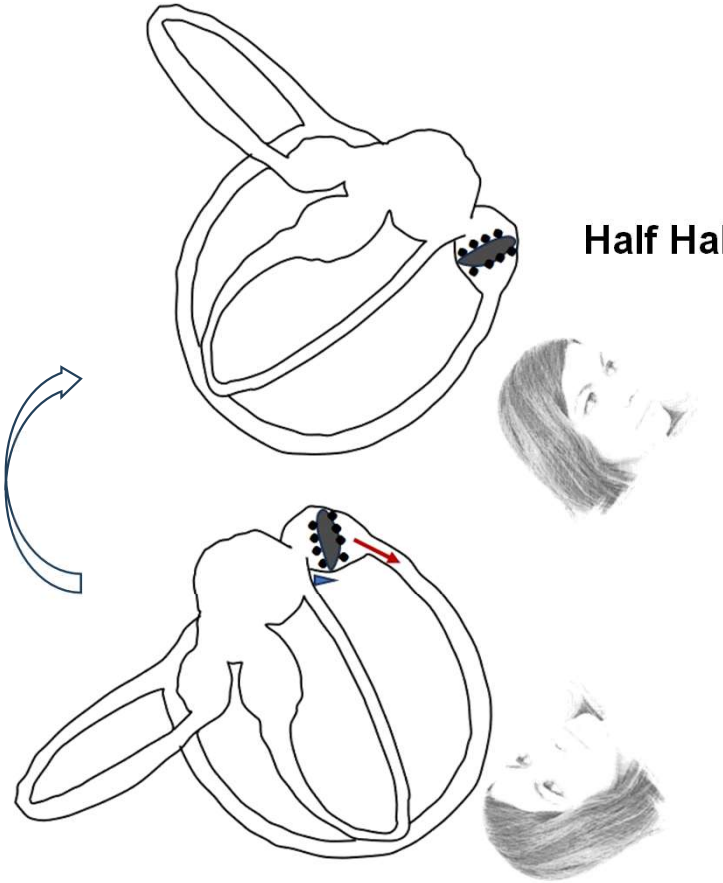
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**Half Hallpike test**

**Dix Hallpike test**

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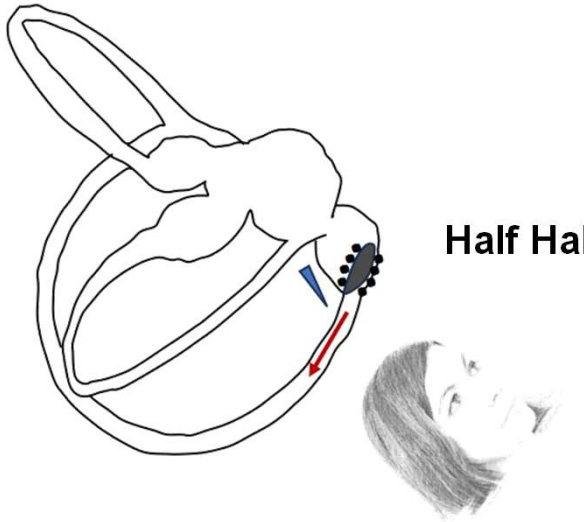
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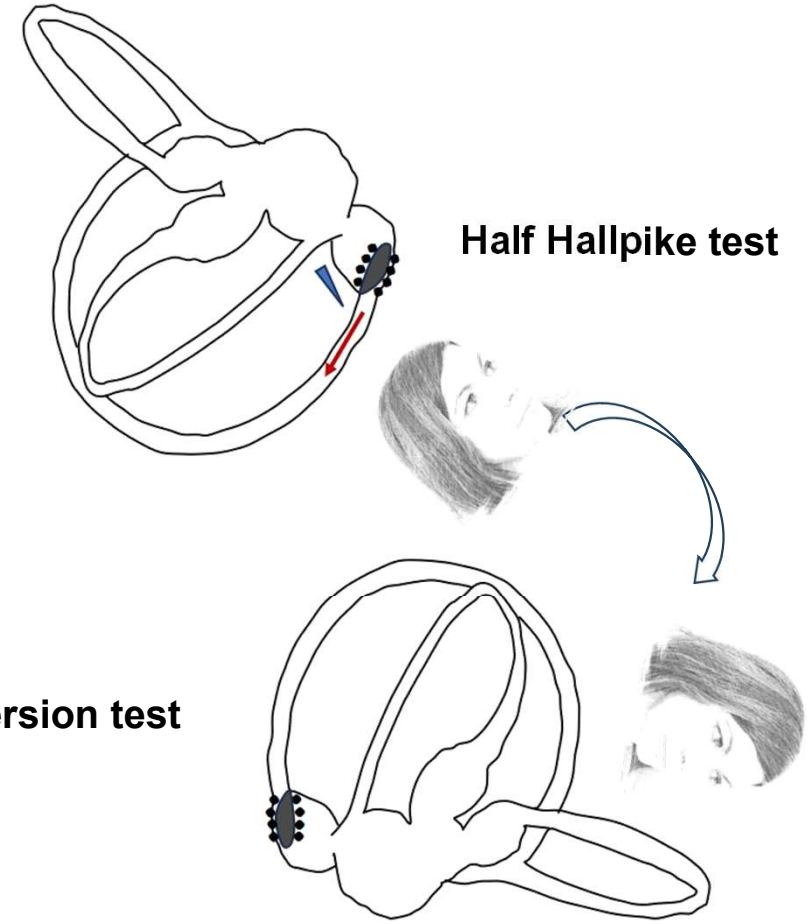
**Cupulolithiasis of the posterior semicircular canal**

*Hiroaki Ichijo, MD, PhD**

*Ichijo Ear, Nose and Throat Clinic, Hirosaki, Japan*

Retrospective analysis of nystagmus characteristics and clinical applications of positional testing in patients with cupulolithiasis of the posterior semicircular canal in benign paroxysmal positional vertigo

Jing Wu, Yihuai Zou, Wenyan Xu*, Hongming Ma, Lixian Huang, Bo Zhao and Liman Sun



**Half Hallpike test**

**Inversion test**

# PC cupulolithiasis

**3D analysis of benign positional nystagmus due to cupulolithiasis in posterior semicircular canal**

TAKAO IMAI[1,2], NORIAKI TAKEDA[3], MAHITO ITO[4], KAZUNORI SEKINE[3], GO SATO[3], YOSHIHIRO MIDOH[5], KOJI NAKAMAE[5] & TAKESHI KUBO[2]

**Cupulolithiasis of the posterior semicircular canal**

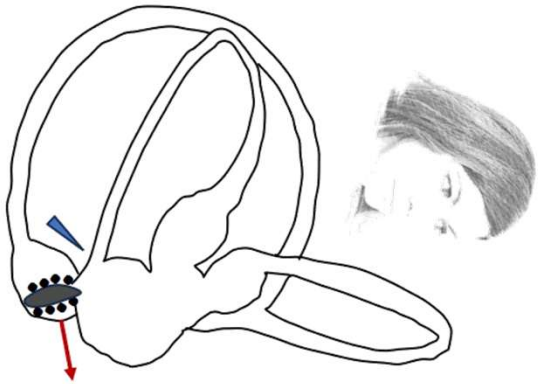
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*Ichijo Ear, Nose and Throat Clinic, Hirosaki, Japan*

Retrospective analysis of nystagmus characteristics and clinical applications of positional testing in patients with cupulolithiasis of the posterior semicircular canal in benign paroxysmal positional vertigo

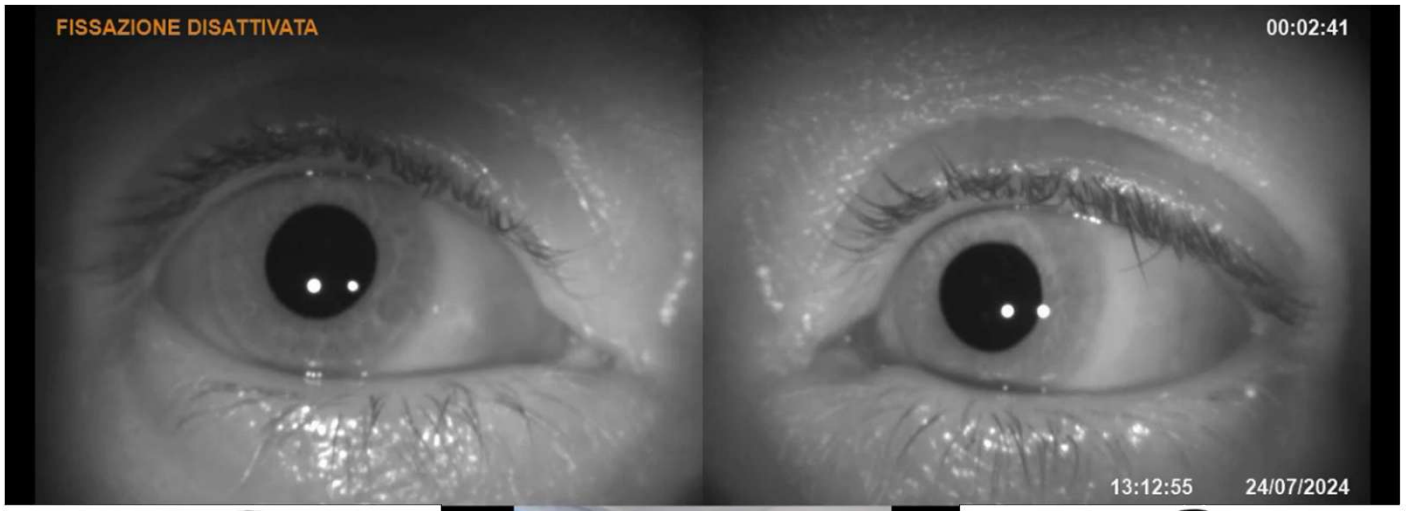
Jing Wu, Yihuai Zou, Wenyan Xu*, Hongming Ma, Lixian Huang, Bo Zhao and Liman Sun

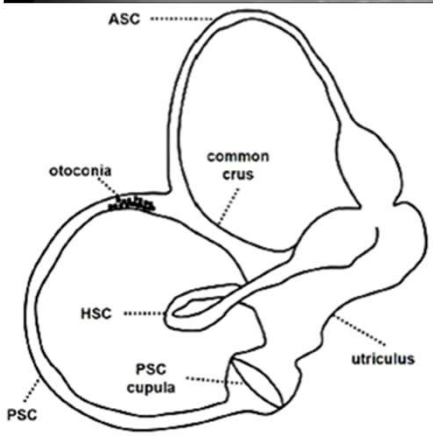
**Inversion test**



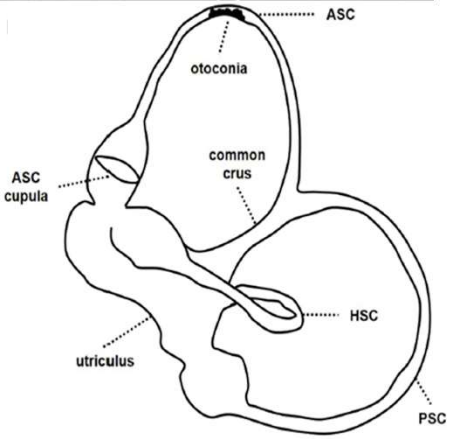
# AC BPPV vs Apogeotropic PC BPPV

- Persistent downbeat/torsional nystagmus in provoking position (positional/partial canalith jam)
- No nystagmus when returning in upright position





# AC BPPV vs Apogeotropic PC BPPV

Acta Otolaryngol (Stockh) 1995; Suppl 520: 143–147

**Atypical "Reversed" Paroxysmal Positioning Nystagmus in Benign Paroxysmal Positional Vertigo**

G. AGUS, R PUXEDDU, G.P. DEMONTIS and P. PUXEDDU
*From the Department of Surgery, Division of Otolaryngology, University of Cagliari, Italy*

Positional down beating nystagmus in 50 patients: cerebellar disorders and possible anterior semicircular canalithiasis

P Bertholon, A M Bronstein, R A Davies, P Rudge, K V Thilo

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

**Paolo Vannucchi, Rudi Pecci, and Beatrice Giannoni**

*Service of Audiology, Department of Oto-Neuro-Ophthalmology, Surgical Sciences, University of Florence, Viale Morgagni 85, 50100 Florence, Italy*

Anterior canal BPPV and apogeotropic posterior canal BPPV: two rare forms of vertical canalolithiasis

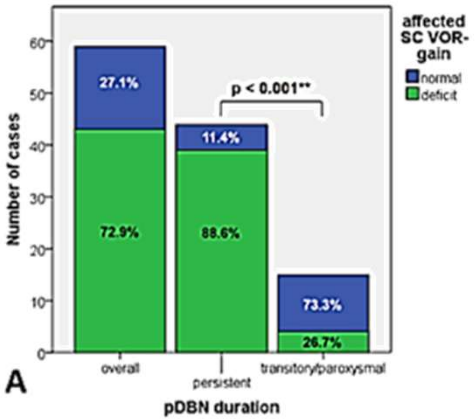
*Vertigine parossistica posizionale benigna da canalolitiasi anteriore e da canalolitiasi posteriore apogeotropa: due rare forme di canalolitiasi verticale*

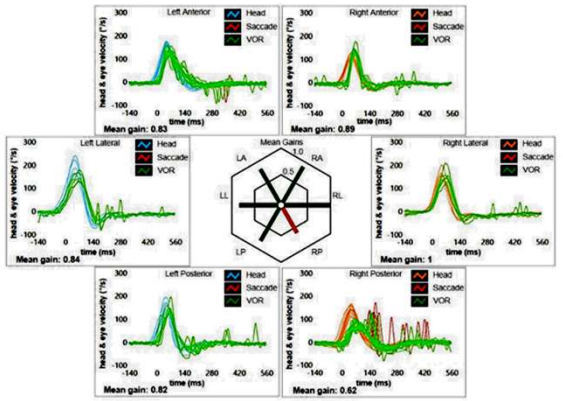
L. CALIFANO, F. SALAFIA, S. MAZZONE, M.G. MELILLO, M. CALIFANO
Departmental Unit of Audiology and Phoniatrics "G. Rummo" Hospital, Benevento, Italy

**Feasibility of Using the Video-Head Impulse Test to Detect the Involved Canal in Benign Paroxysmal Positional Vertigo Presenting With Positional Downbeat Nystagmus**

*Andrea Castellucci[1*†], Pasquale Malara[2†], Salvatore Martellucci[3†], Cecilia Botti[1,4], Silvia Delmonte[1], Silvia Quaglieri[5], Elisabetta Rebecchi[6], Enrico Armato[7], Massimo Ralli[8,9], Marco Lucio Manfrin[5], Angelo Ghidini[1] and Giacinto Asprella Libonati[10]*

*[1] ENT Unit, Department of Surgery, Azienda USL - IRCCS di Reggio Emilia, Reggio Emilia, Italy, [2] Audiology and Vestibology Service, "Centromedico Bellinzona", Bellinzona, Switzerland, [3] ENT Unit, "Santa Maria Goretti" Hospital, Azienda USL Latina, Latina, Italy, [4] PhD Program in Clinical and Experimental Medicine, University of Modena and Reggio Emilia, Modena, Italy, [5] ENT Unit, Policlinico San Matteo Fondazione (IRCCS), Pavia, Italy, [6] ENT Unit, "Guglielmo da Saliceto" Hospital, Piacenza, Italy, [7] ENT Unit, "SS Giovanni e Paolo" Hospital, Venice, Italy, [8] Head and Neck Department, ENT Clinic, Policlinico Umberto I, Rome, Italy, [9] Department of Sense Organs, Sapienza University of Rome, Rome, Italy, [10] Vestibology and ENT Unit, "Giovanni Paolo II" Hospital, Matera, Italy*



# Sitting up vertigo

- No nystagmus in returning in provoking position
- Upbeat/ipsilesional torsional nystagmus when returning in upright position

Sitting Up Vertigo. Proposed Variant of Posterior Canal Benign Paroxysmal Positional Vertigo

Darío H. Scocco, Iván E. García, and María A. Barrerio

*Institute of Neuroscience, Favaloro Foundation University Hospital, Buenos Aires, Argentina*

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journal homepage: www.journals.elsevier.com/journal-of-otology/

"Sitting-up vertigo as an expression of posterior semicircular canal heavy cupula and posterior semicircular canal short arm canalolithiasis"

Darío H. Scocco*, María A. Barreiro, Iván E. García

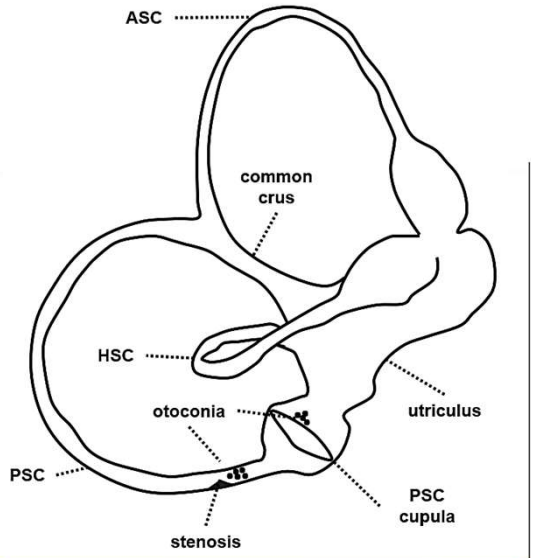
*Institute of Neuroscience, Favaloro Foundation University Hospital, Buenos Aires, Argentina*

***Sitting-Up Vertigo:* An Expression of Periampullary Posterior Semicircular Canalolithiasis with Partial Canal Jam**

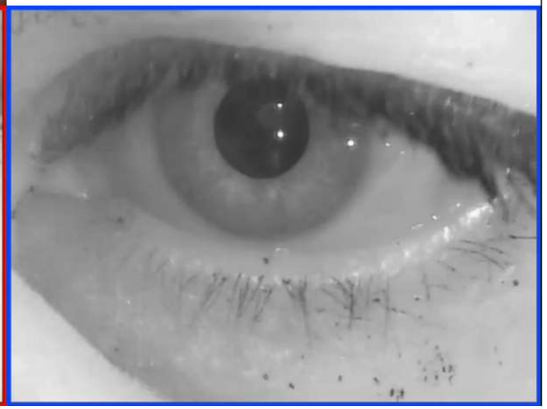
**Ajay K. Vats, Shreya Vats[1], Sudhir Kothari[2]**

Consultant Neurophysician, Chaudhary Hospital and Medical Research Centre Private Limited, Udaipur, Rajasthan, [1]Clinical Vestibulology Observer, Otoneurology Centre, Udaipur, Rajasthan, [2]Department of Neurology, Poona Hospital and Research Centre, Pune, Maharashtra, India







# PC canalith jam

- Spontaneous downbeat/contralesional torsional nystagmus increasing in provoking positions
- Reduced activity for the affected PC at the vHIT

LETTER TO THE EDITOR

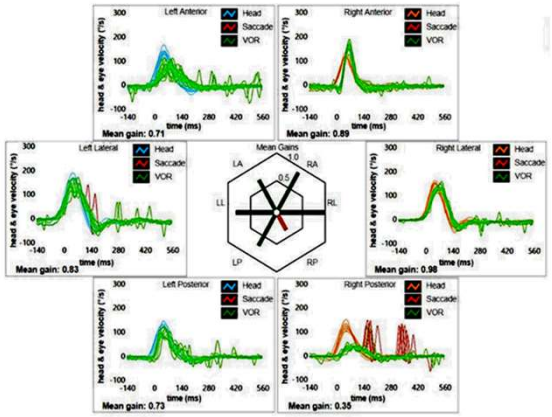
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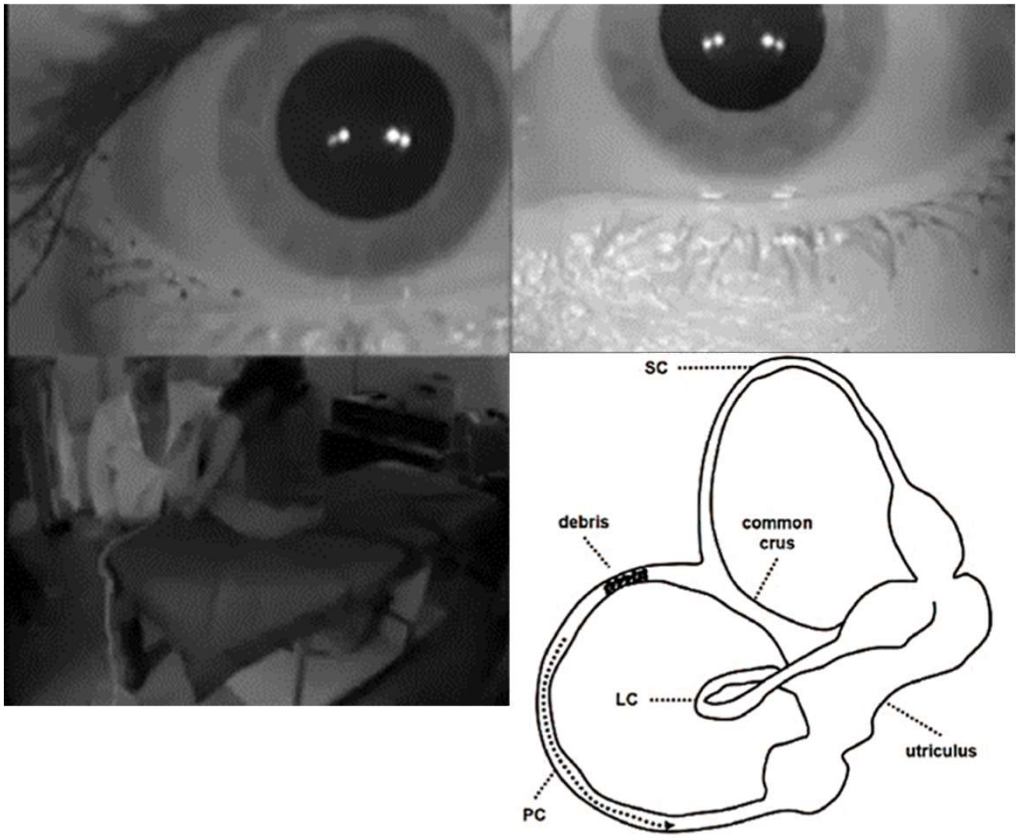
**Spontaneous downbeat nystagmus in posterior semicircular canal benign paroxysmal positional vertigo: a canalith jam?**

Andrea Castellucci [1] · Pasquale Malara [2] · Angelo Ghidini [1]

Fluctuating Posterior Canal Function in Benign Paroxysmal Positional Vertigo Depending on How and Where Otoconia Are Disposed

*Andrea Castellucci, †Pasquale Malara, ‡Salvatore Martellucci, *Silvia Delmonte, and *Angelo Ghidini



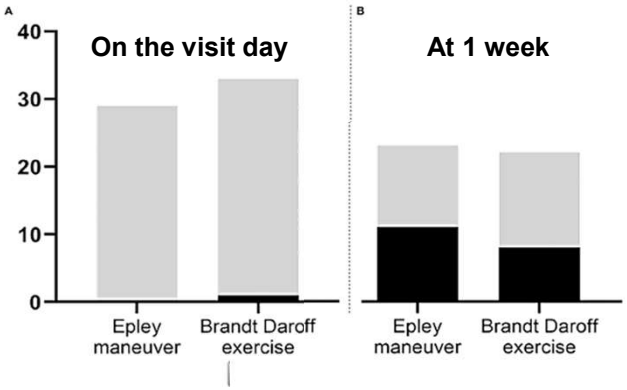



# Canalith Repositioning Maneuvers

- In these atypical variants, **standard CRM are usually ineffective**

## Effect of the Epley Maneuver and Brandt-Daroff Exercise on Benign Paroxysmal Positional Vertigo Involving the Posterior Semicircular Canal Cupulolithiasis: A Randomized Clinical Trial

*Seo-Young Choi[1], Jae Wook Cho[2], Jae-Hwan Choi[2], Eun Hye Oh[2] and Kwang-Dong Choi[1]*




RESEARCH ARTICLE

## Clinical characteristics and repositioning efficacy analysis of posterior canal-benign paroxysmal positional vertigo-canalolithiasis and vertigo-cupulolithiasis patients

Comparison Of Pc-Bppv-Ca and Pc-Bppv-cu

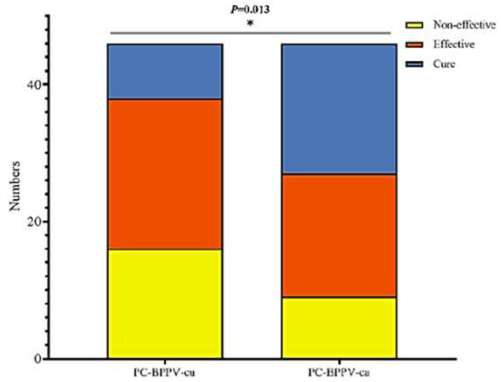
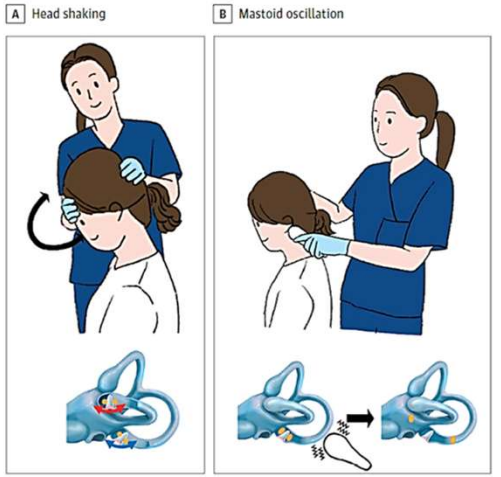



Figure 4. Comparison of efficacy of initial maneuvers in both groups.




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## Treatment Maneuvers in Cupulolithiasis of the Posterior Canal Benign Paroxysmal Positional Vertigo

### A Randomized Clinical Trial

Eun Hye Oh, MD, PhD; Jae-Hwan Choi, MD, PhD; Hyun Sung Kim, MD; Seo Young Choi, MD, PhD; Hyun Ah Kim, MD, PhD; Hyung Lee, MD, PhD; In Soo Moon, MD, PhD; Ji-Yun Park, MD, PhD; Byeol-A Yoon, MD, PhD; Sang Ho Kim, MD, PhD; Jeong-Yeon Kim, MD; Hyo Jung Kim, PhD; Kwang-Dong Choi, MD, PhD

# Canalith Repositioning Maneuvers

audiology research

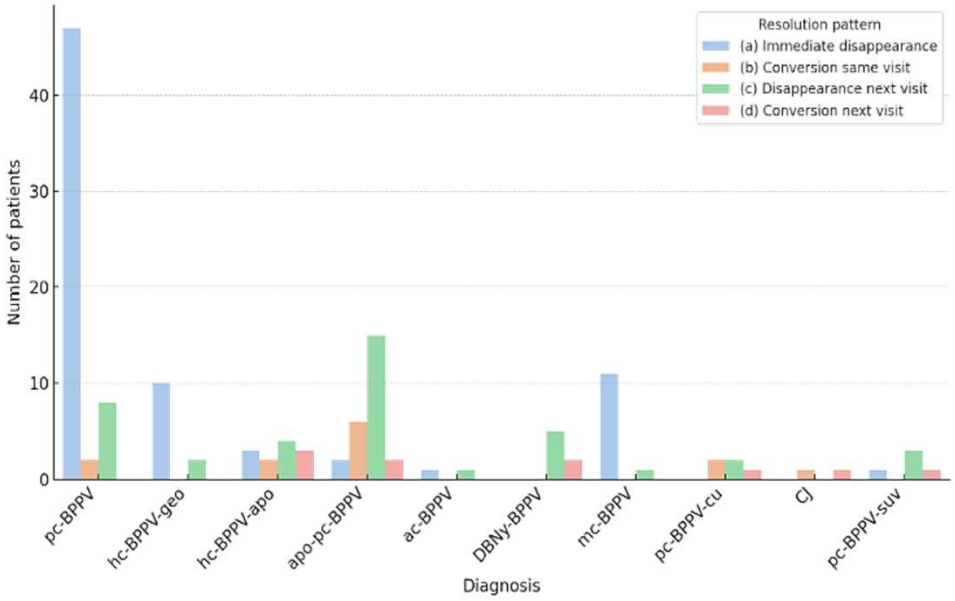
MDPI

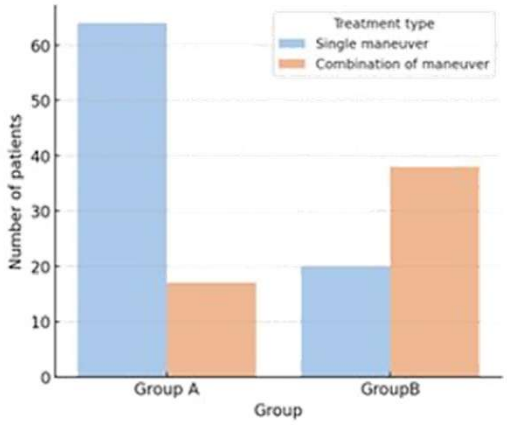
*Article*

## Revisiting BPPV: Incidence and Behavior of Atypical Variants

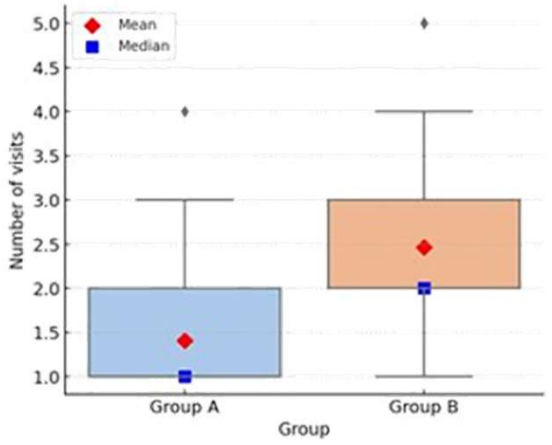
Salvatore Martellucci [1], Andrea Castellucci [2], Pasquale Malara [3], Luigi Califano [4] and Giacinto Asprella Libonati [5,*]

[1] ENT Unit, Santa Maria Goretti Hospital, AUSL Latina, 04100 Latina, Italy; dott.martellucci@gmail.com
[2] ENT Unit, Department of Surgery, Arcispedale Santa Maria Nuova, AUSL-IRCCS Reggio Emilia, 42123 Reggio Emilia, Italy; andrea.castellucci@ausl.re.it
[3] Audiology & Vestibology Service, Centromedico, 6500 Bellinzona, Switzerland; pasmalara@gmail.com
[4] Department of Audiology and Phoniatrics, San Pio Hospital, 82100 Benevento, Italy; luigi.califano1958@gmail.com
[5] ENT Unit, Santa Maria delle Grazie Hospital, ASM Matera, 75100 Matera, Italy
* Correspondence: giacintoasprella@gmail.com




(a)




(b)

# Impulsive Maneuvers

- **Impulsive maneuvers** might be beneficial
  - **Brandt-Daroff exercises** aim to **disrupt and disperse debris using random body rotations**

Physical Therapy for Benign Paroxysmal Positional Vertigo

Thomas Brandt, MD, Robert B. Daroff, MD



# Impulsive Maneuvers

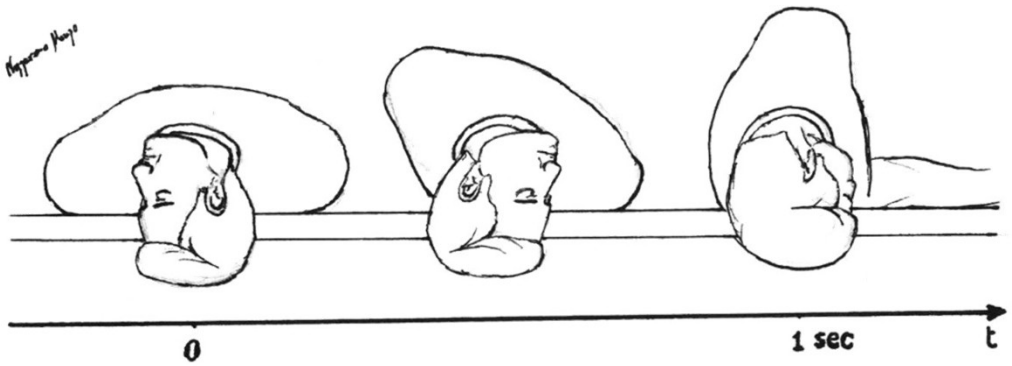
- **Impulsive maneuvers** might be beneficial
  - **Quick Liberatory Rotation Maneuver (PC-BPPV)**

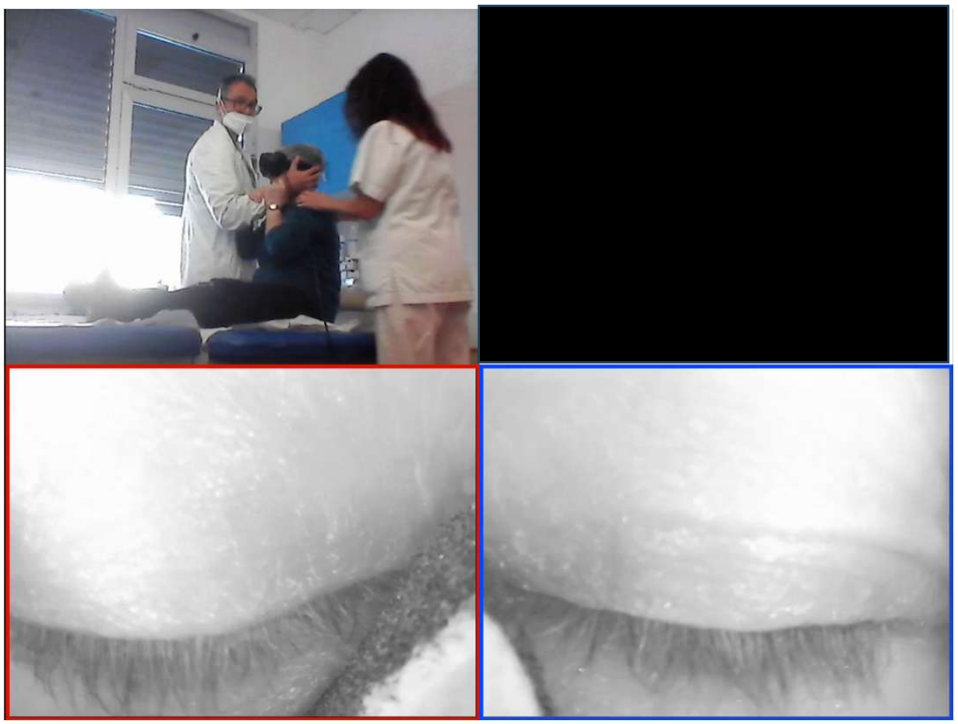
ACTA OTORHINOLARYNGOL ITAL 2003;23:161-167

## Treatment of Benign Paroxysmal Positional Vertigo of posterior semicircular canal by "Quick Liberatory Rotation Manoeuvre"

*Trattamento della Vertigine Parossistica Posizionale da labirintolitiasi posteriore con "Rotazione Rapida Liberatoria"*

L. CALIFANO, P.G.G. CAPPARUCCIA, D. DI MARIA, M.G. MELILLO, D. VILLARI
Department of Otorhinolaryngology, "G. Rummo" Hospital, Benevento, Italy



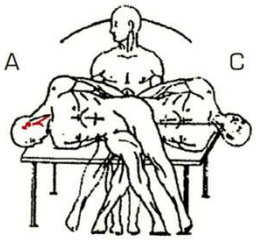
# Impulsive Maneuvers

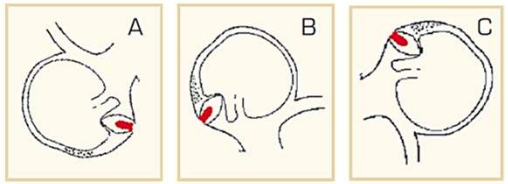
- **Impulsive maneuvers** might be beneficial
  - **Reversed Semont maneuver (AC-BPPV)**

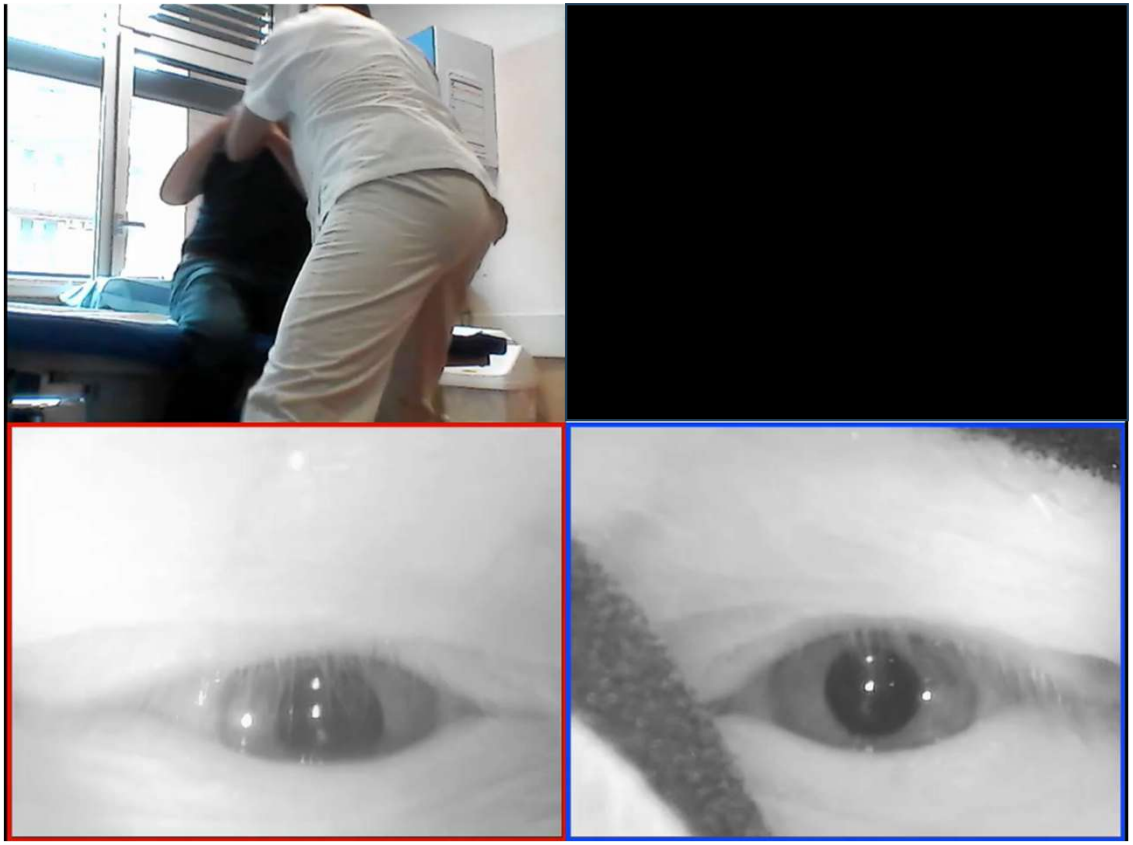
## MANOVRA TERAPEUTICA PER LA VPPB DEL CSA

*PAOLO VANNUCCHI*

*Dipartimento di Scienze Chirurgiche Oto-Neuro-Oftalmologiche*
*Università degli Studi di Firenze*



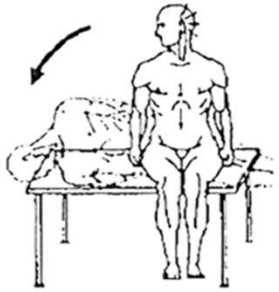
# Canalith Repositioning Maneuvers

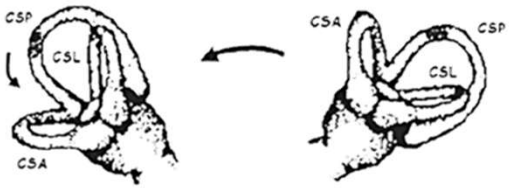
- **Impulsive maneuvers** might be beneficial
  - **Demi Semont maneuver (apogeotropic PC-BPPV)**

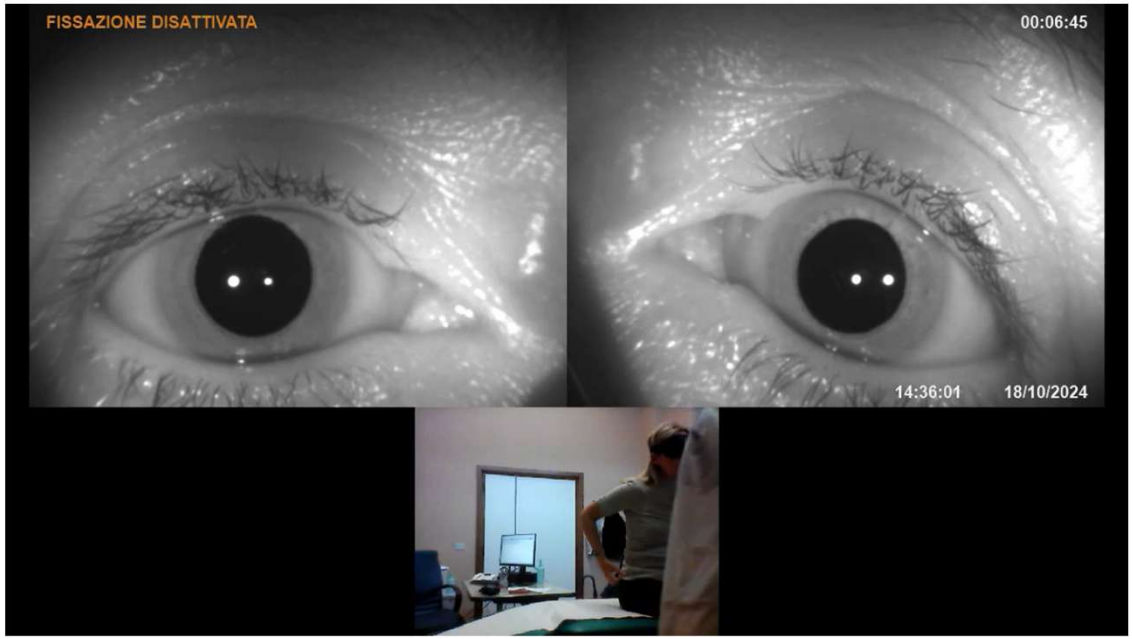
**Apogeotropic posterior semicircular canal benign paroxysmal positional vertigo: some clinical and therapeutic considerations**

Paolo Vannucchi, Rudi Pecci, Beatrice Giannoni, Fabio Di Giustino, Rossana Santimone, Arianna Mengucci

*Department of Surgical Sciences and Translational Medicine, Unit of Audiology, Careggi Hospital, University of Florence, Italy*

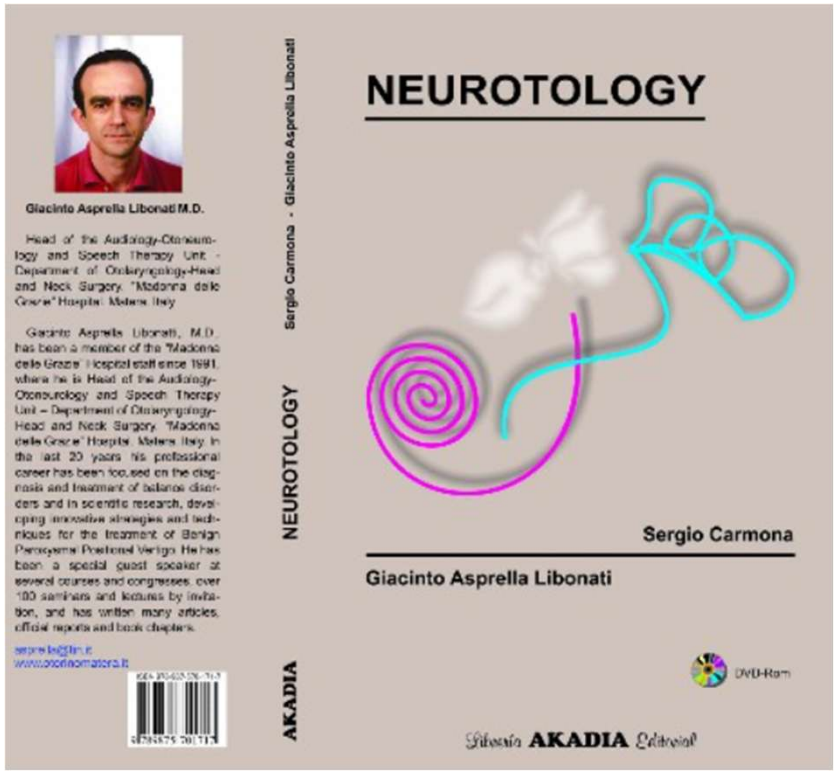




# Impulsive Maneuvers

- **Impulsive maneuvers** might be beneficial
  - **Pendular maneuver (convert from apogeotropic PC-BPPV to PC-BPPV)**

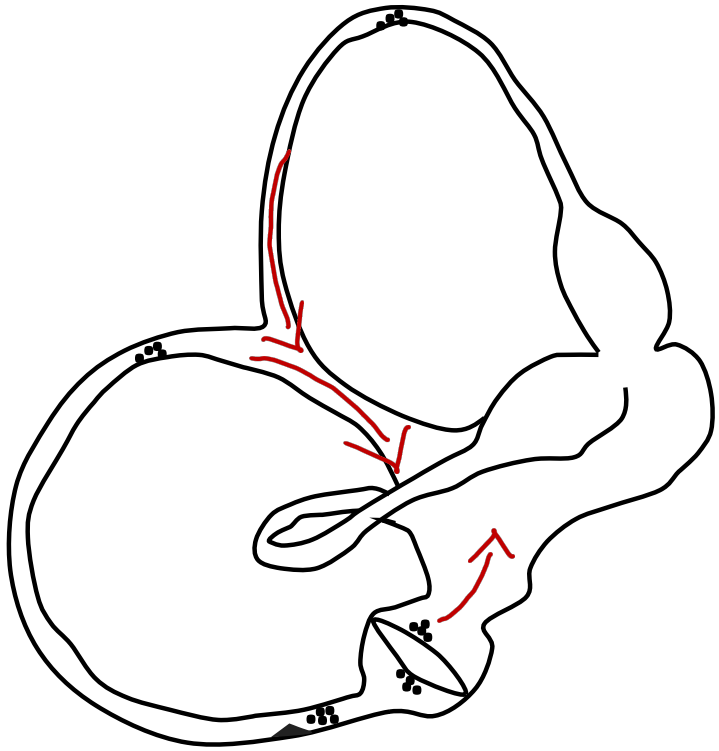





# Bascule maneuver

- We designed a **tailored, impulsive and repetitive maneuver along the affected canal plane (LARP or RALP) along the $X^{LARP}$ / $X^{RALP}$ axes**

- Aims of the maneuver
  - to **treat these atypical variants of PC BPPV**
    resolution of symptoms and signs during the same session or at the following evaluation



# Bascule maneuver

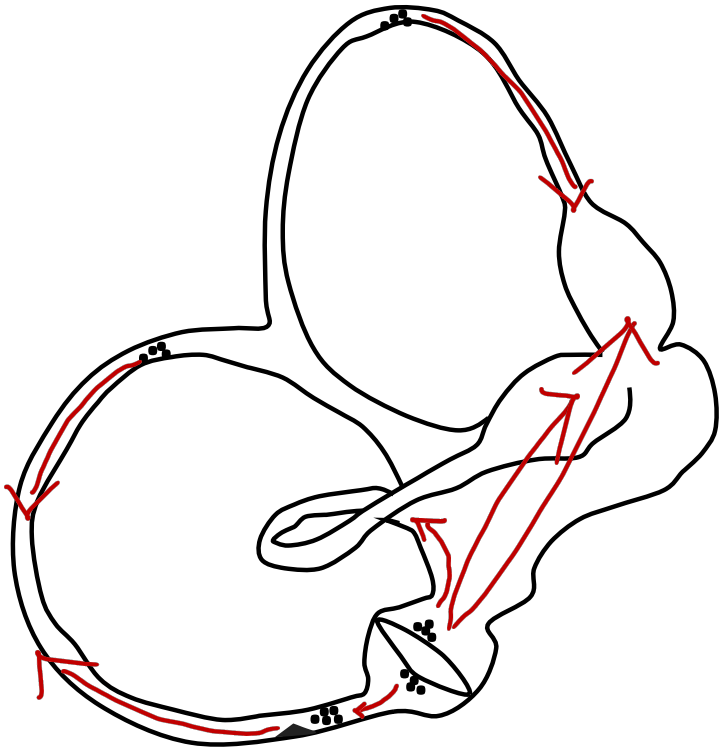
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- Aims of the maneuver

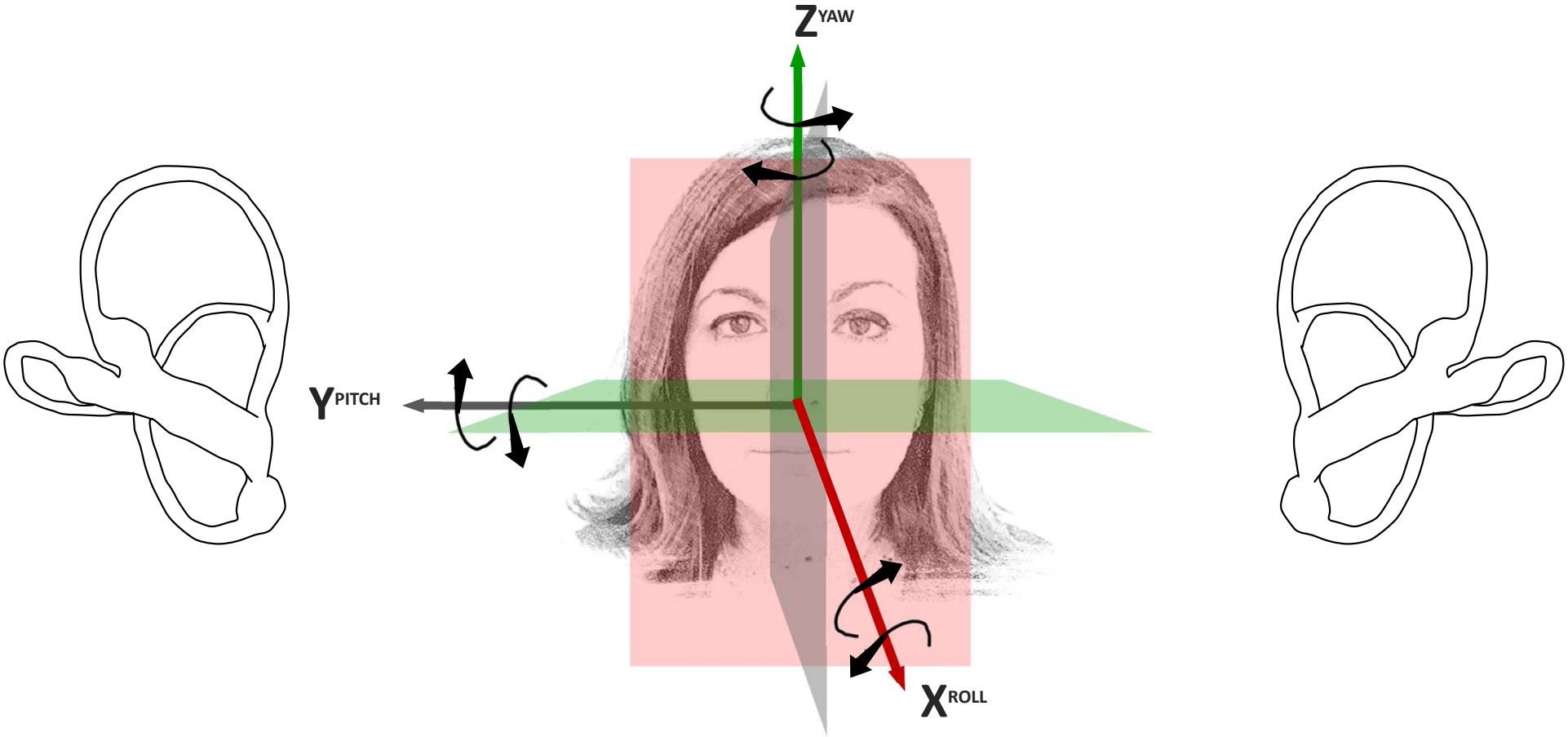
  - to **treat these atypical variants of PC BPPV**
    resolution of symptoms and signs during the same session or at the following evaluation

  - to **convert them in typical forms**
    typical PC-BPPV
    geotropic HC-BPPV
    apogeotropic HC-BPPV
    AC-BPPV

  - to **localize otoconia in uncertain cases**
    AC or non-ampullary PC arm
    canal or utricular side of the PC cupula
    periampullary area or short arm of the PC

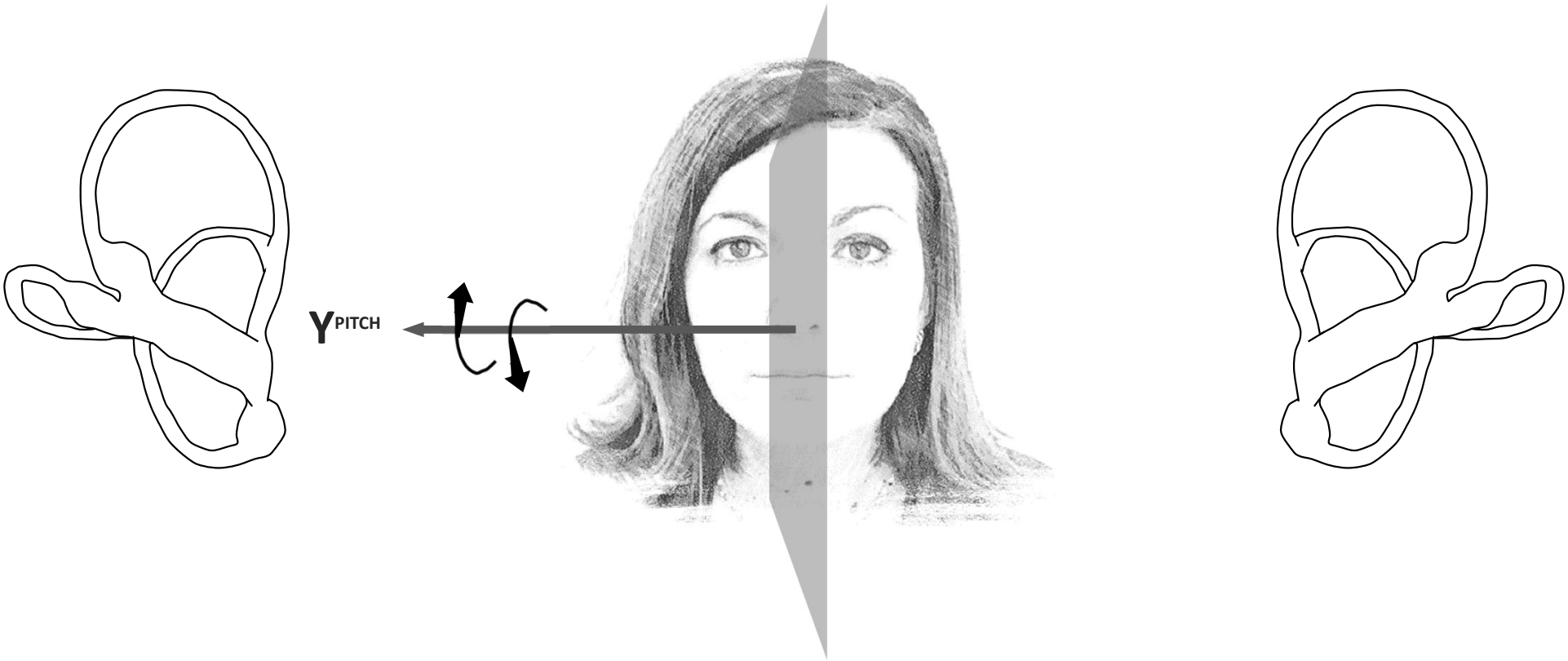


# Spatial planes and axes



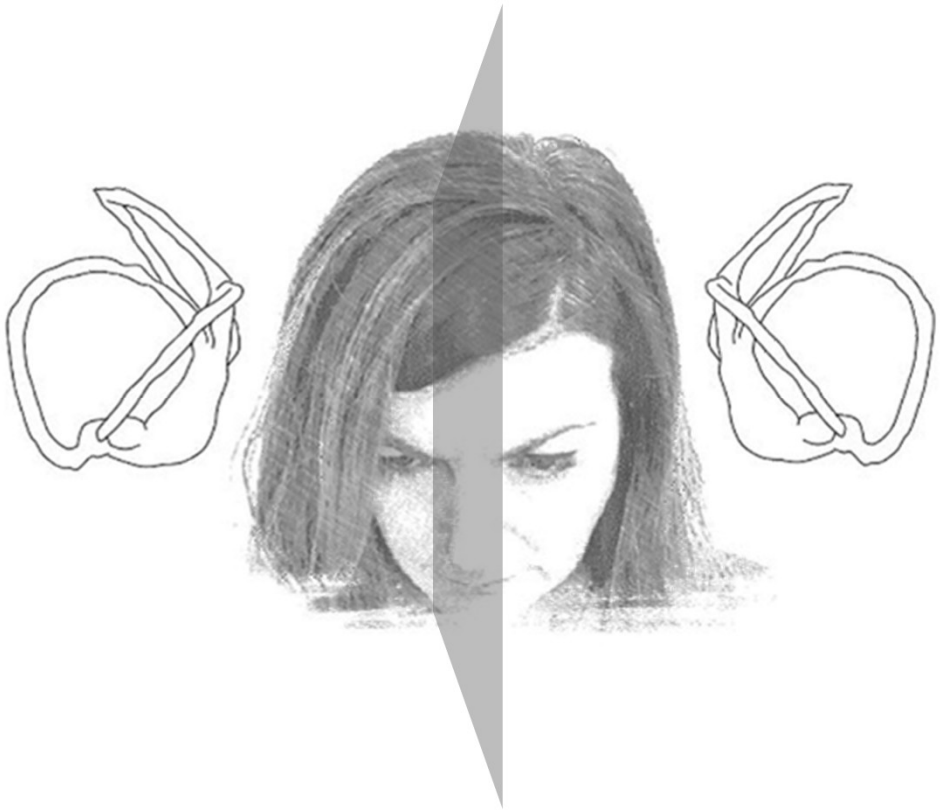
# Spatial planes and axes

## PITCH PLANE



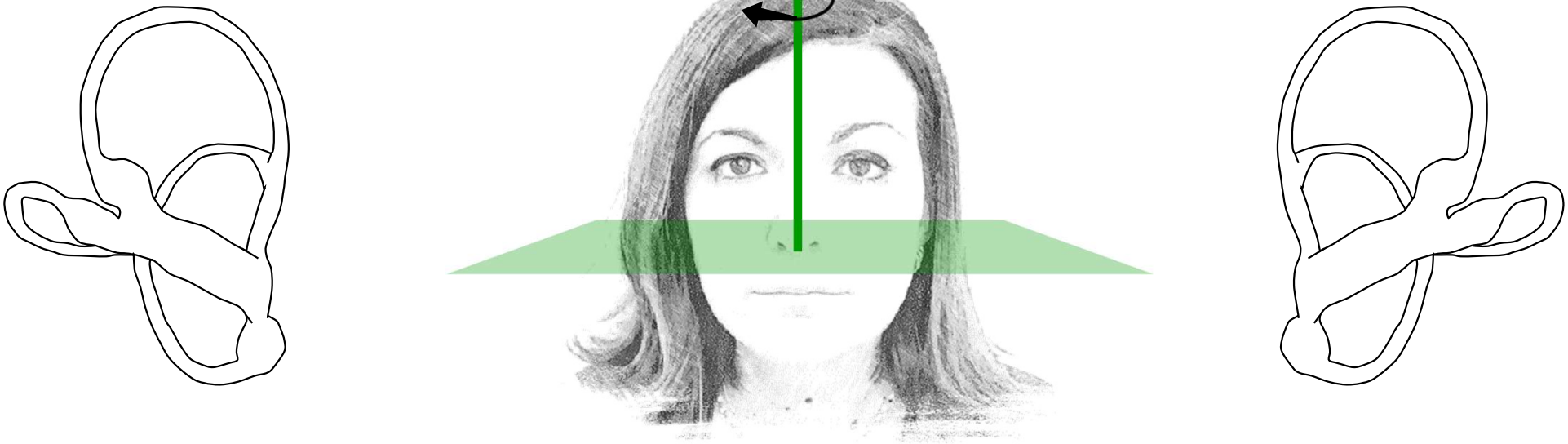
# Spatial planes and axes

## PITCH PLANE



# Spatial planes and axes

## YAW PLANE



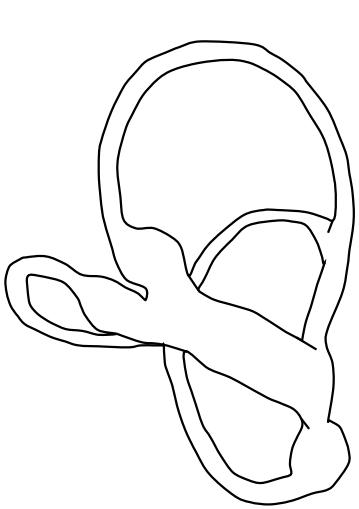
# Spatial planes and axes

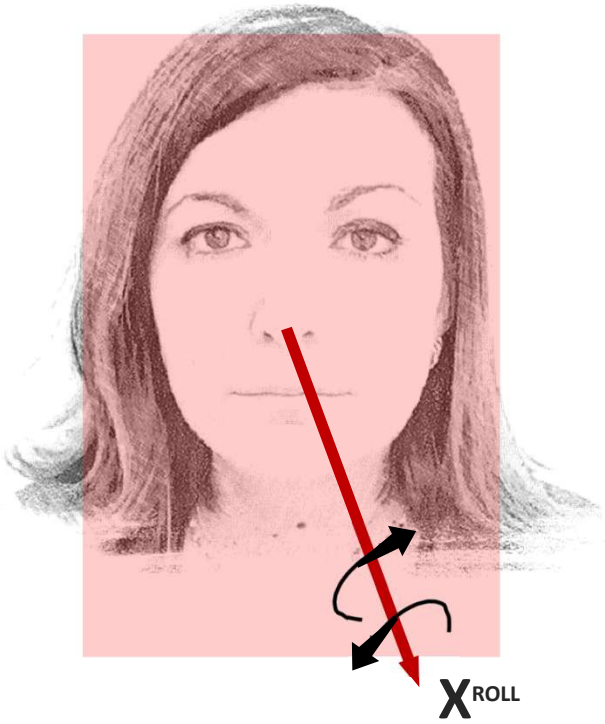
## YAW PLANE

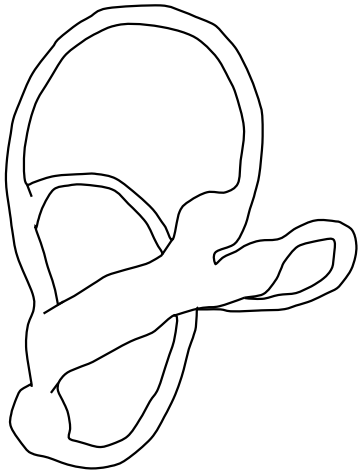


# Spatial planes and axes

## ROLL PLANE

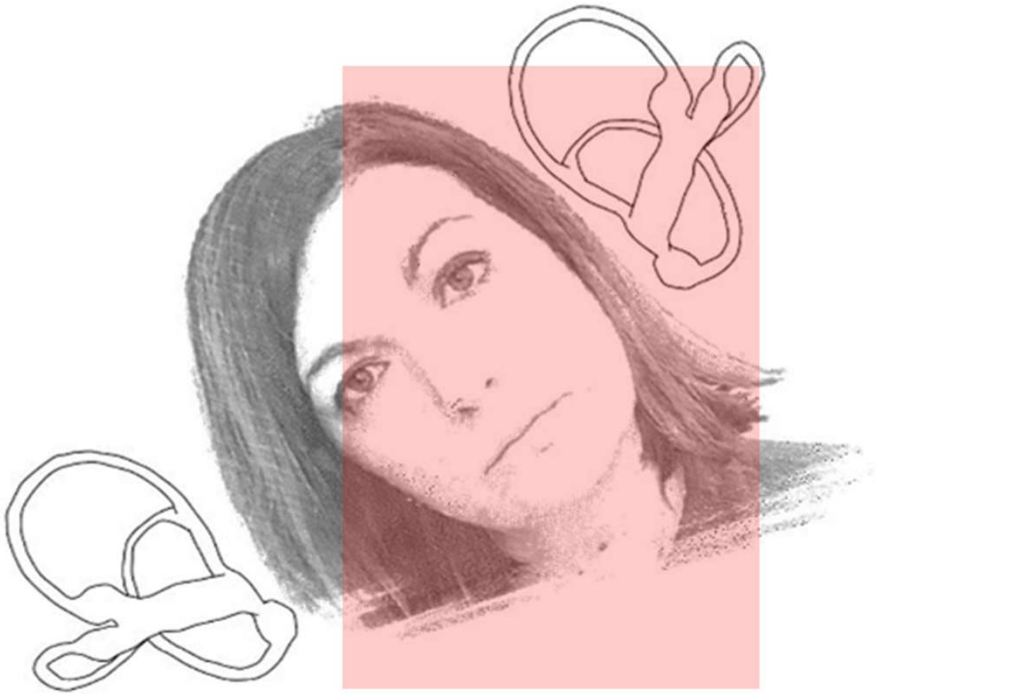




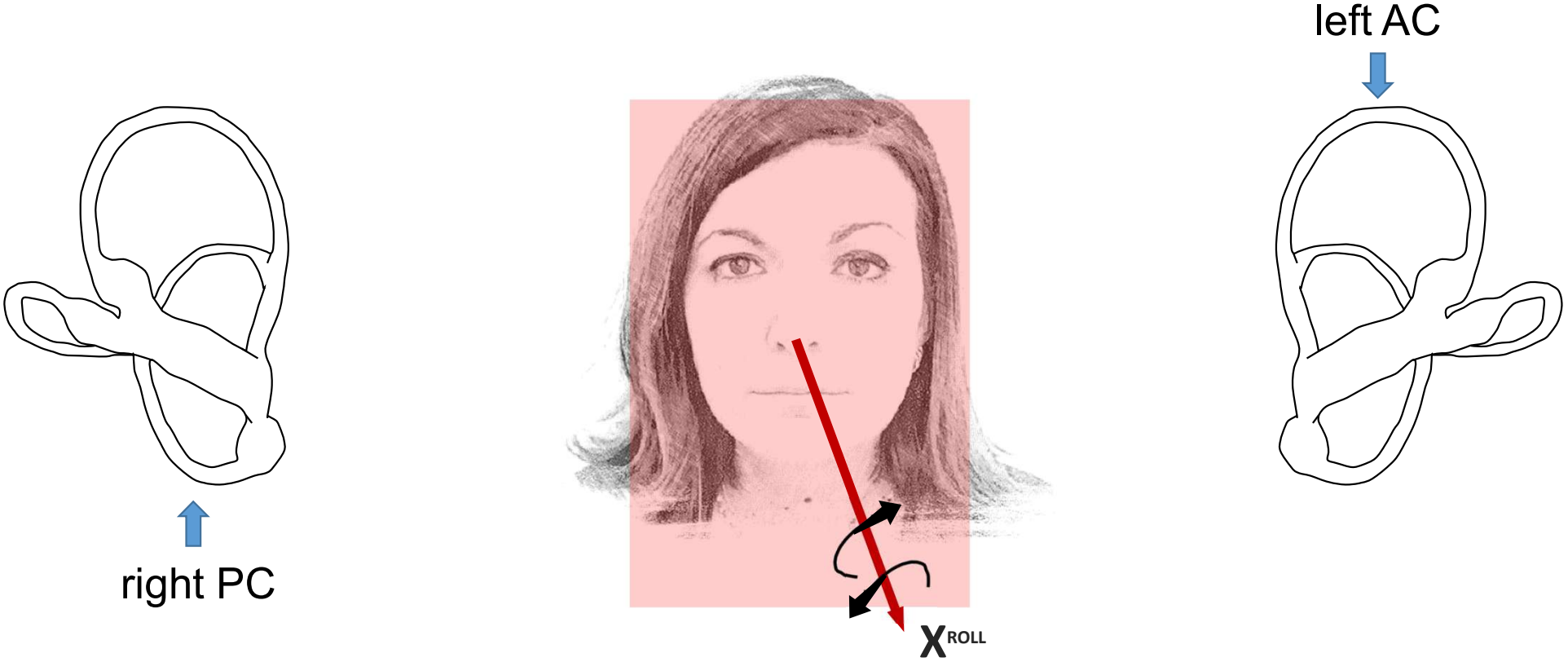
# Spatial planes and axes

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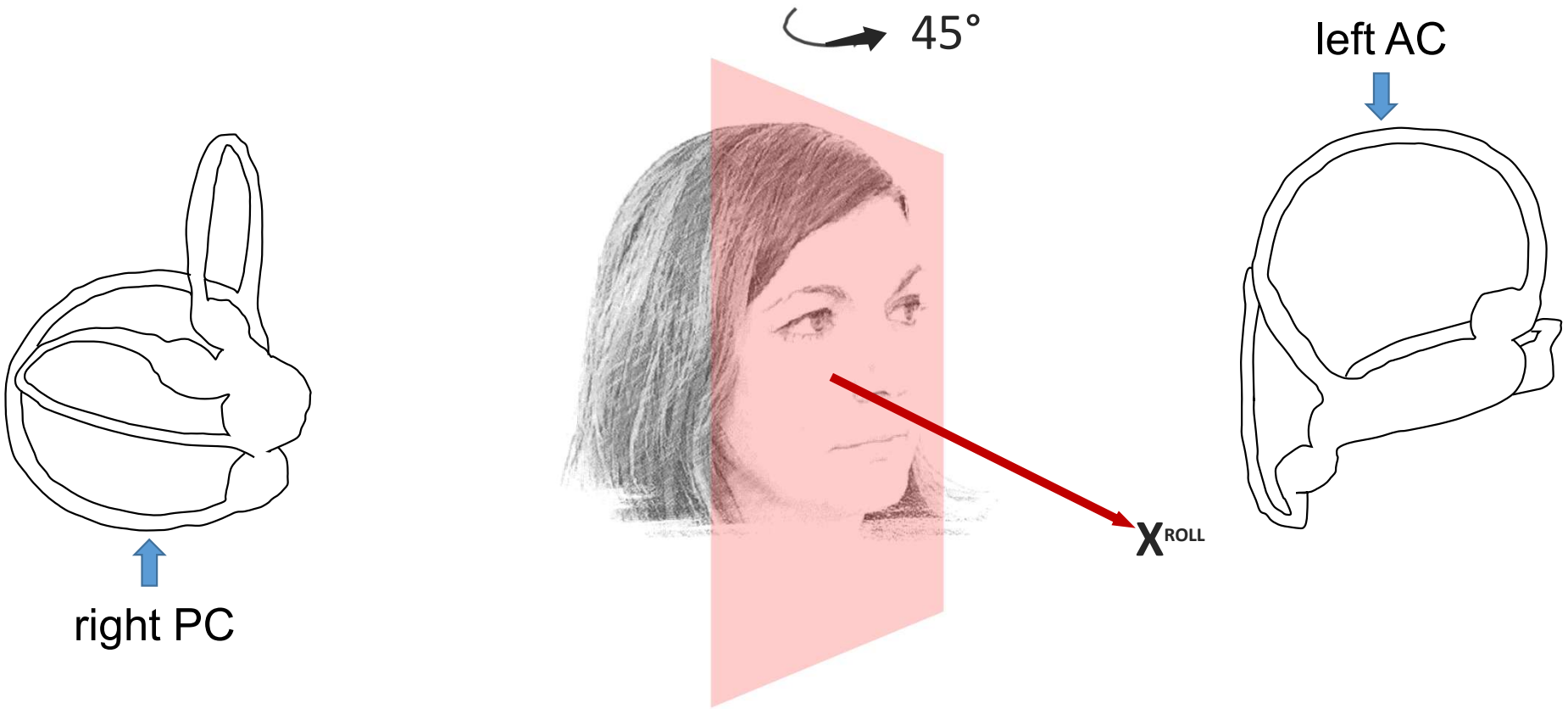


# Spatial planes and axes

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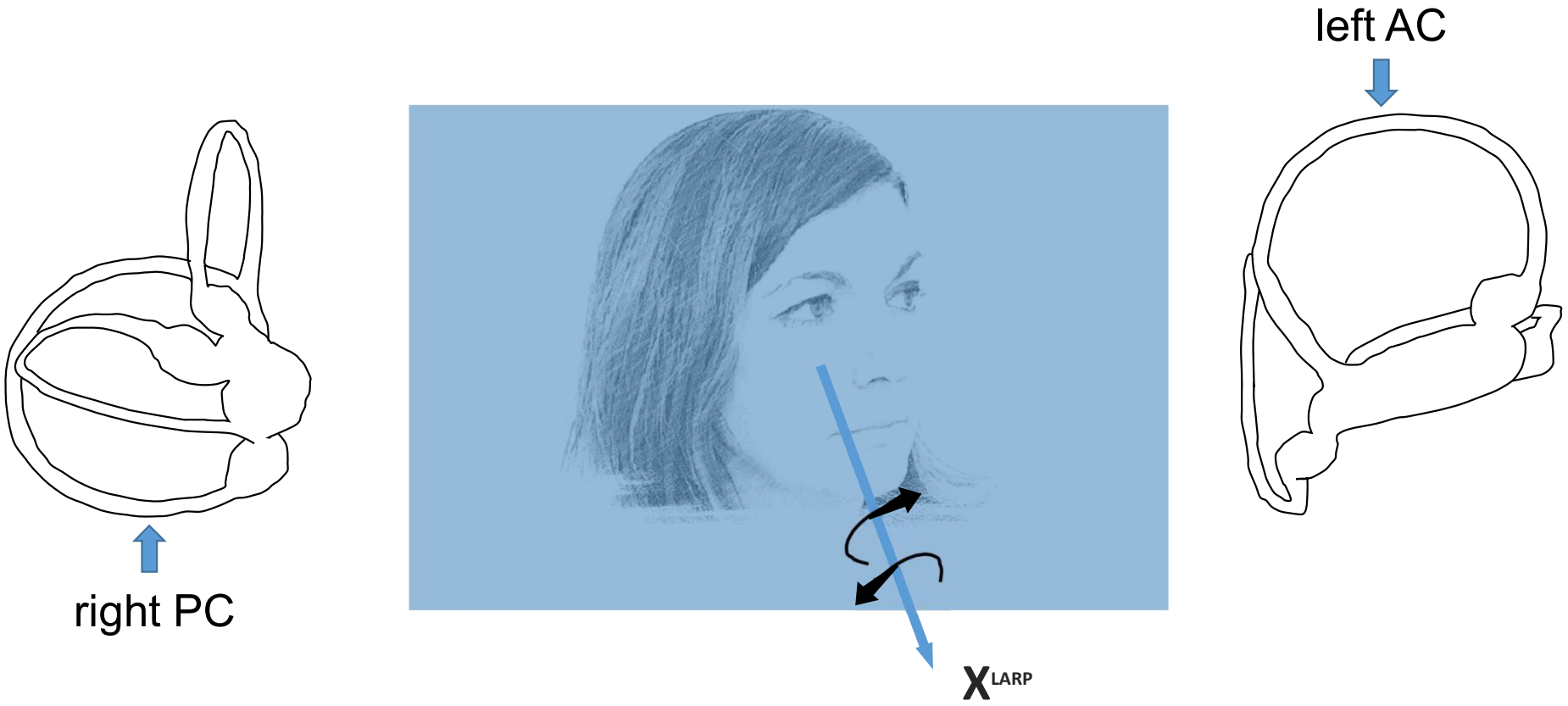


# Spatial planes and axes



# Bascule maneuver planes and axes

## LARP PLANE (around the $X^{LARP}$ AXIS)



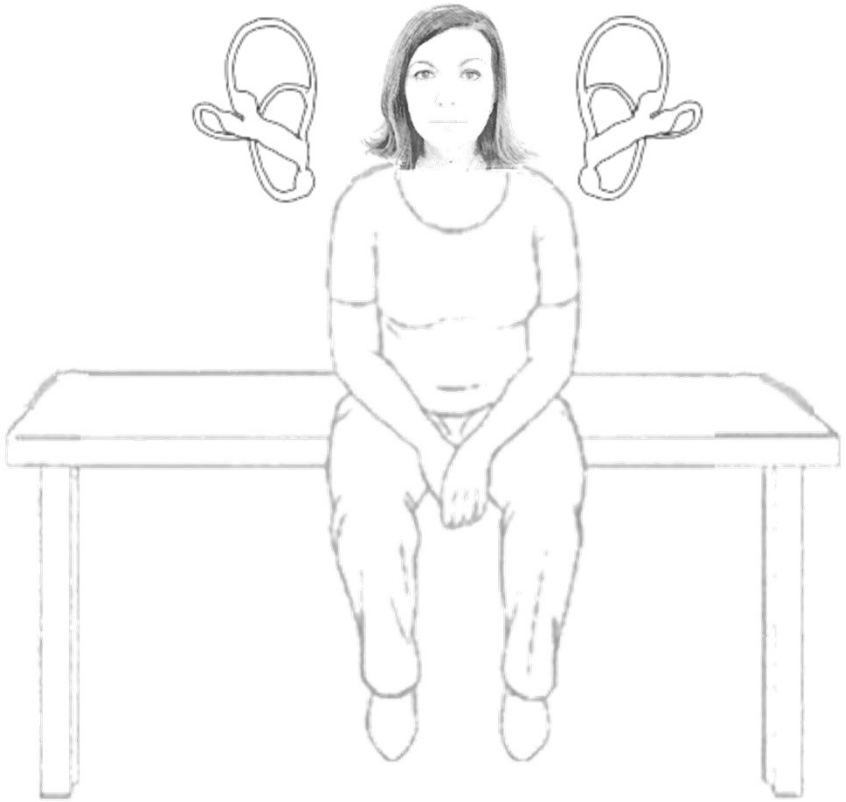
# Bascule maneuver planes and axes

## LARP PLANE (around the $X^{LARP}$ AXIS)



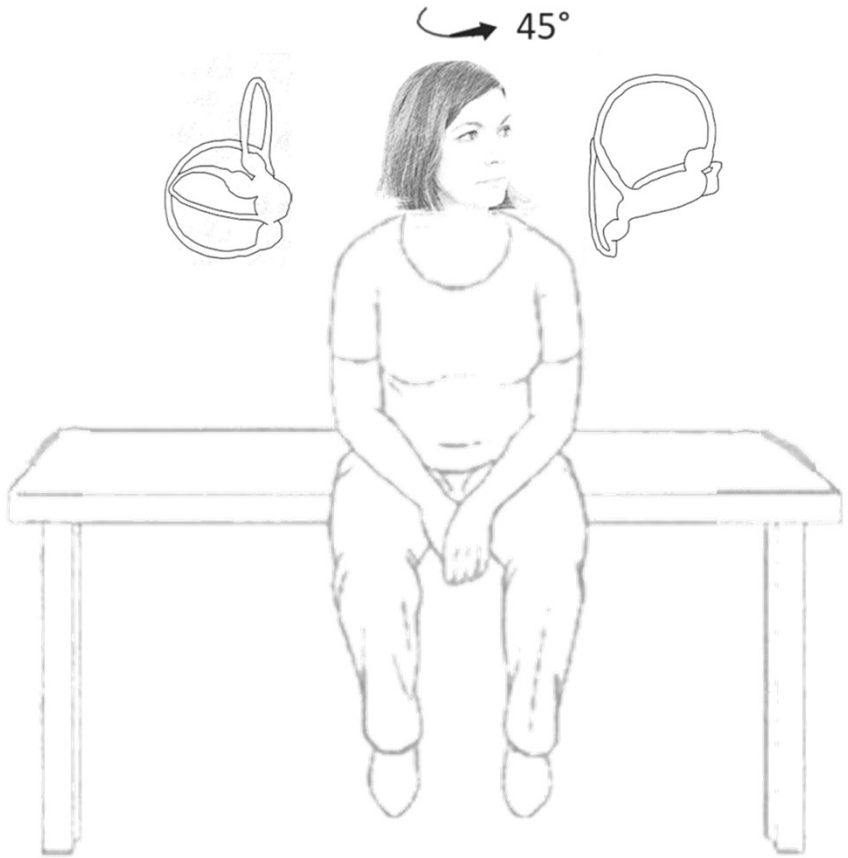
# Bascule maneuver

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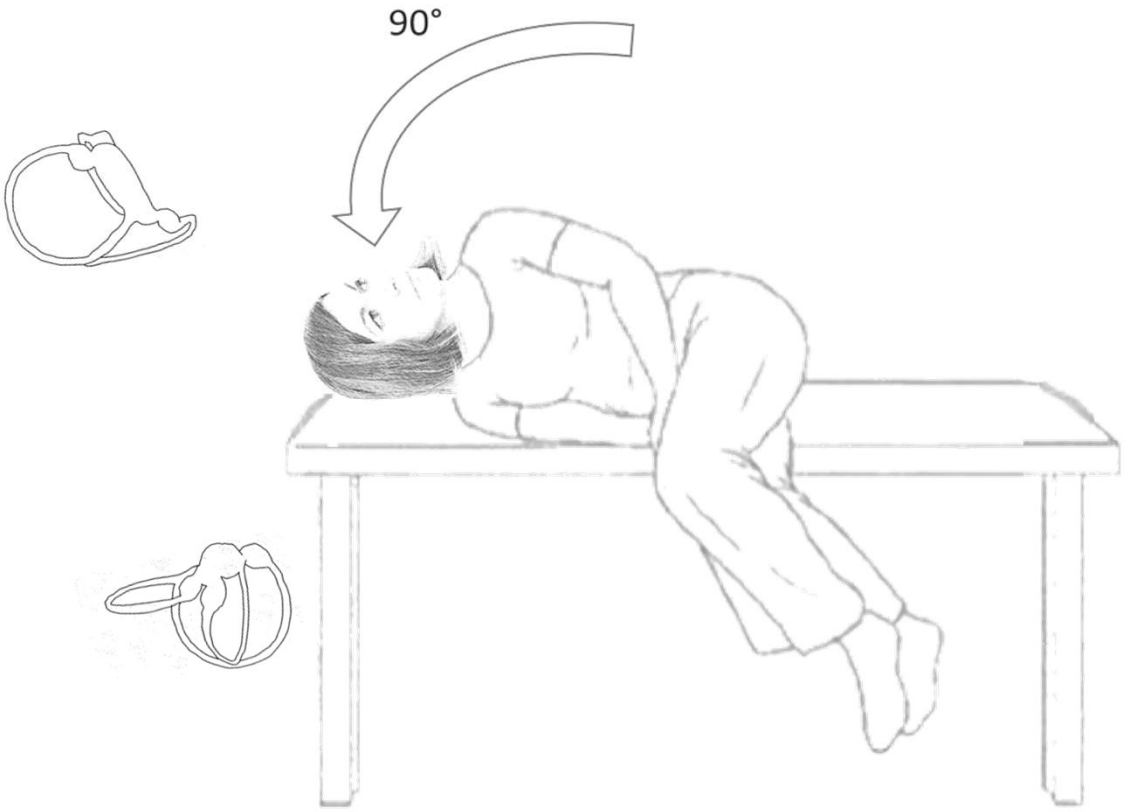
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## LARP PLANE (around the $X^{LARP}$ AXIS)



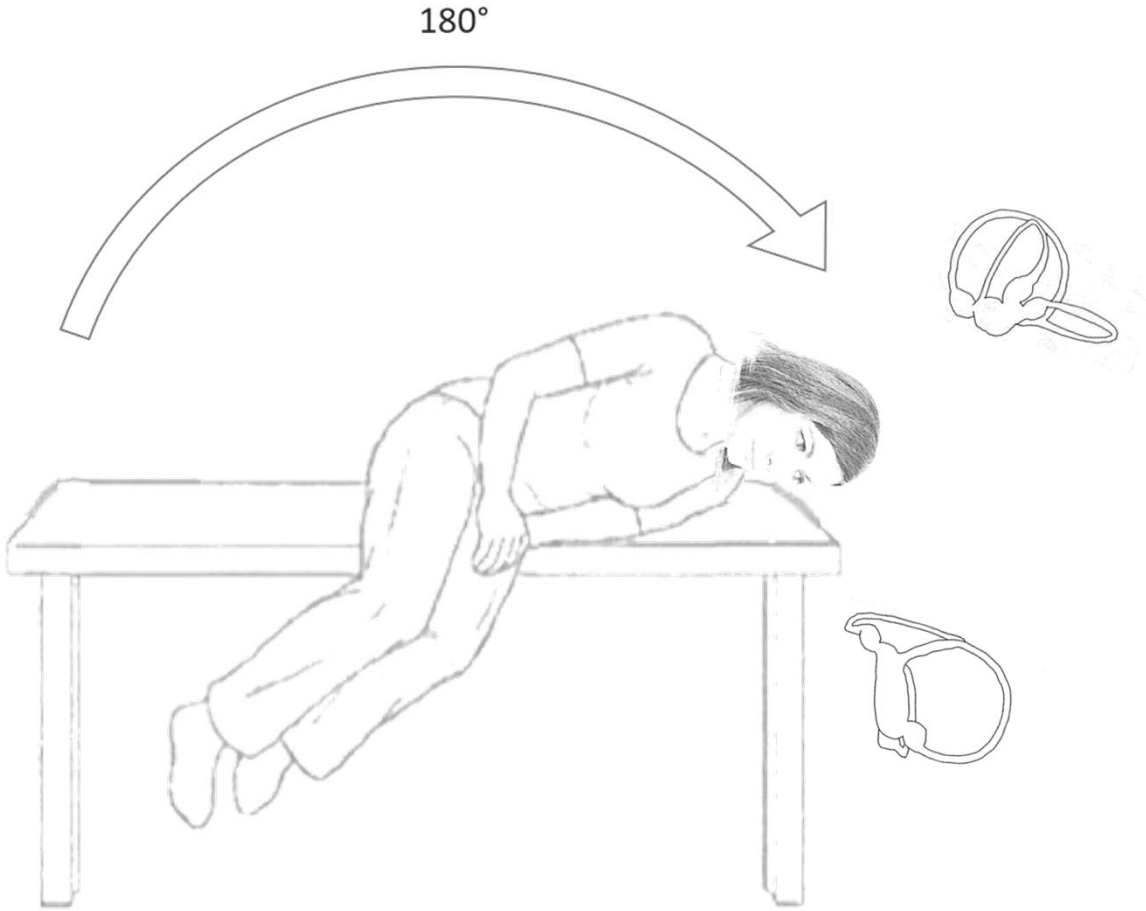
# Bascule maneuver

## LARP PLANE (around the $X^{LARP}$ AXIS)



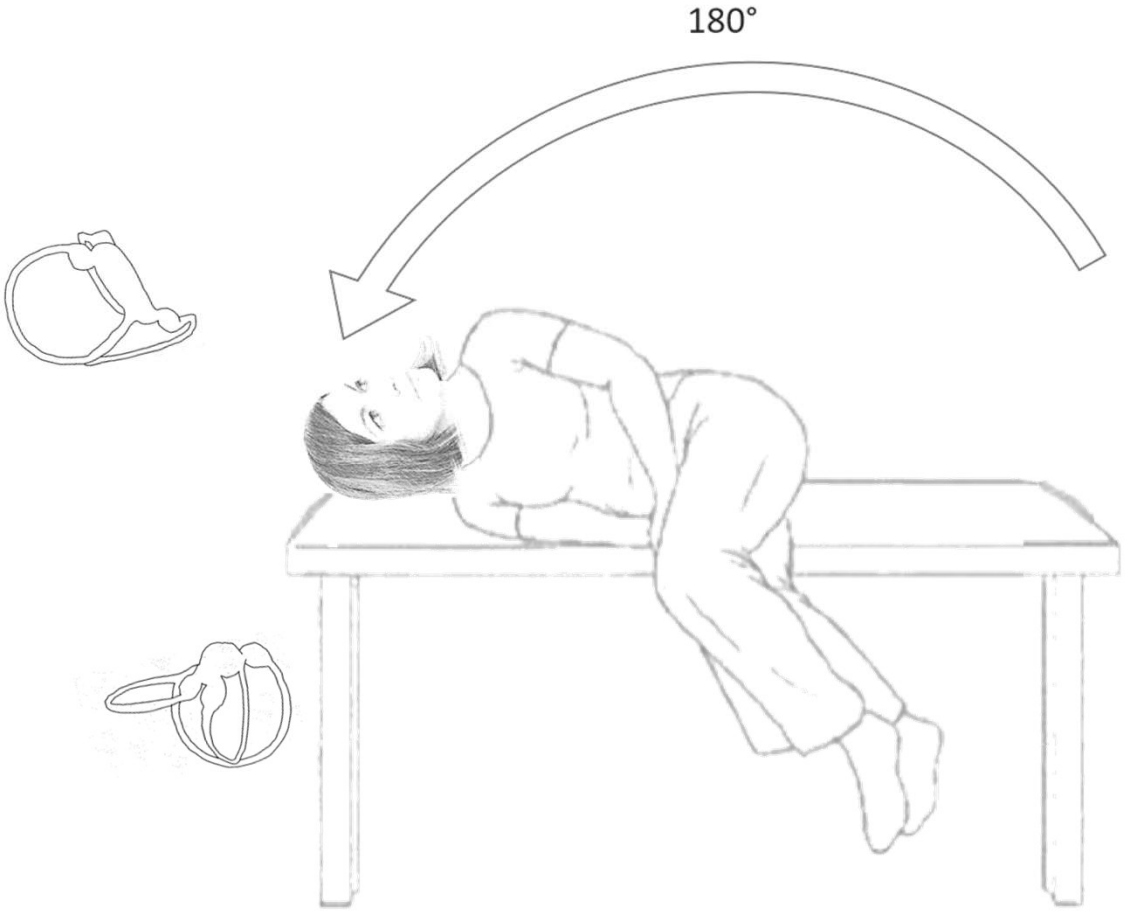
# Bascule maneuver

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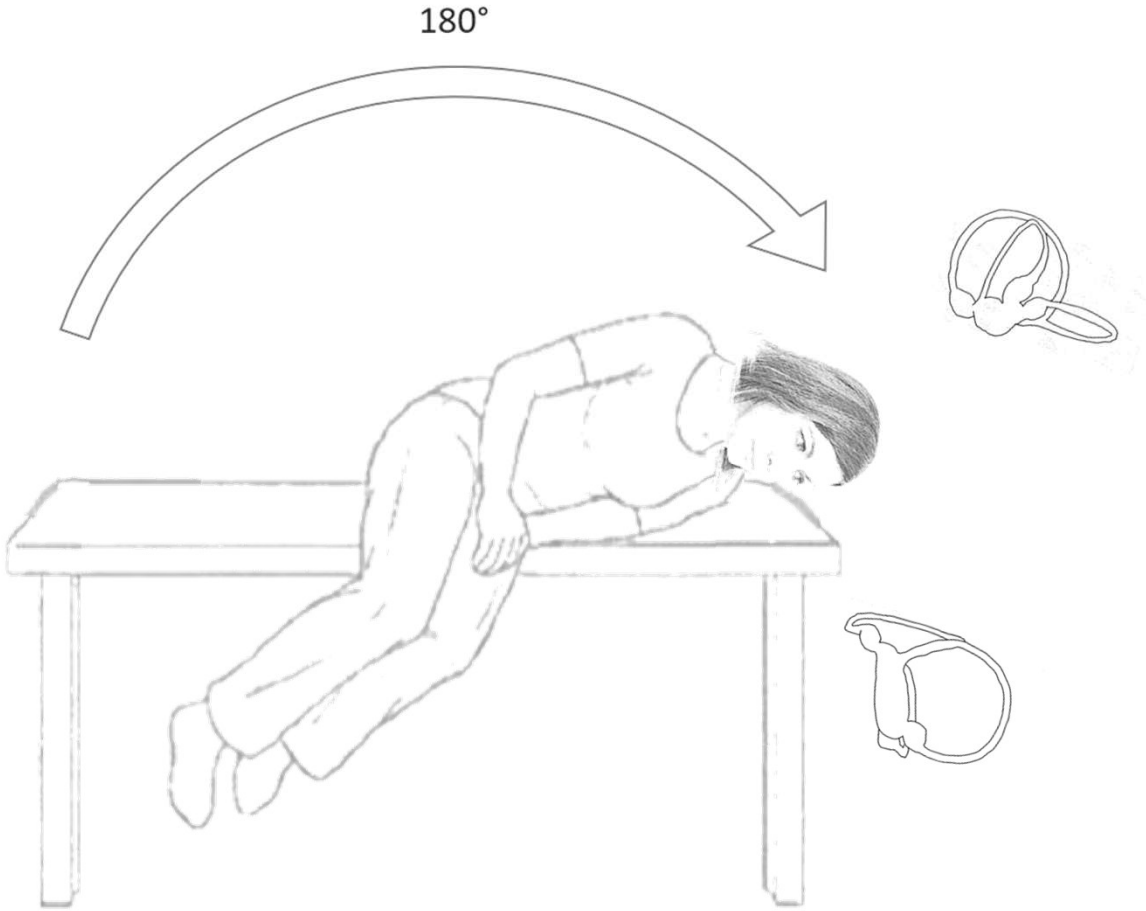
# Bascule maneuver

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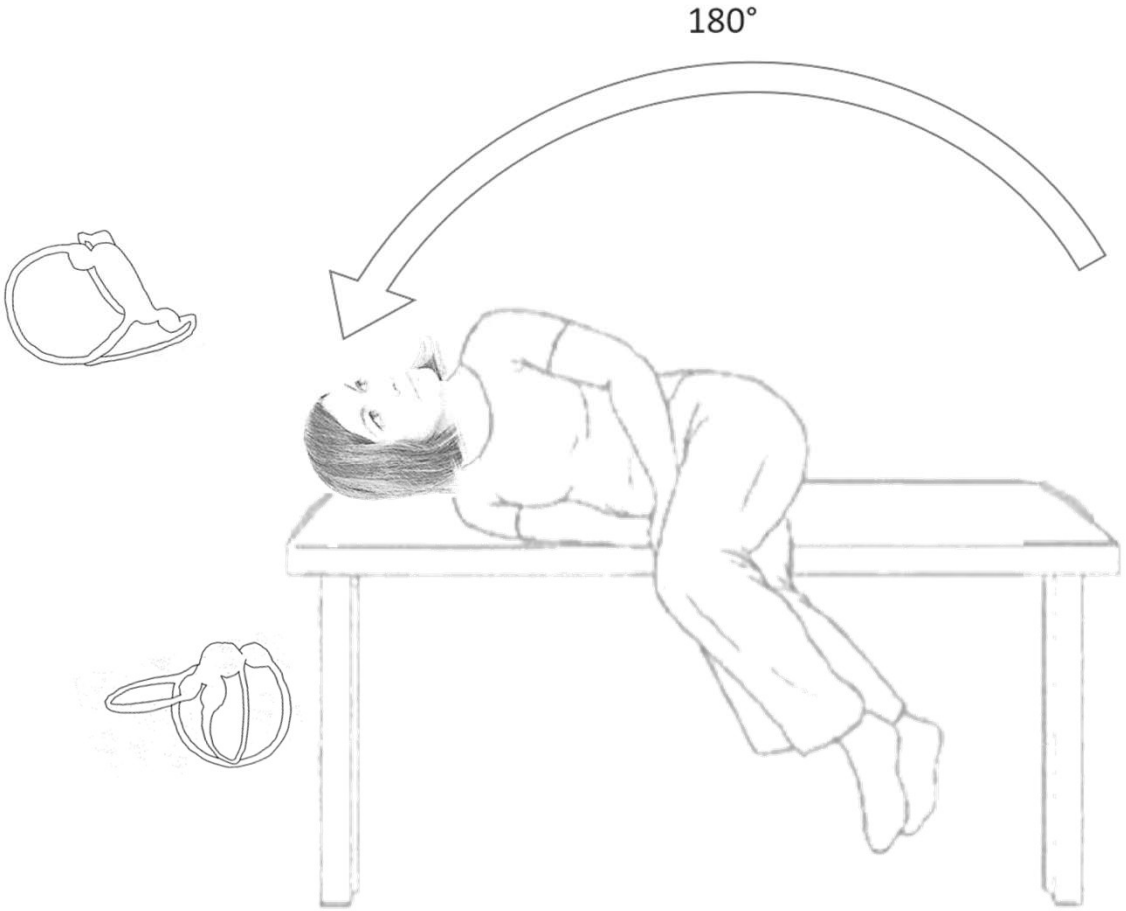
# Bascule maneuver

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# Bascule maneuver

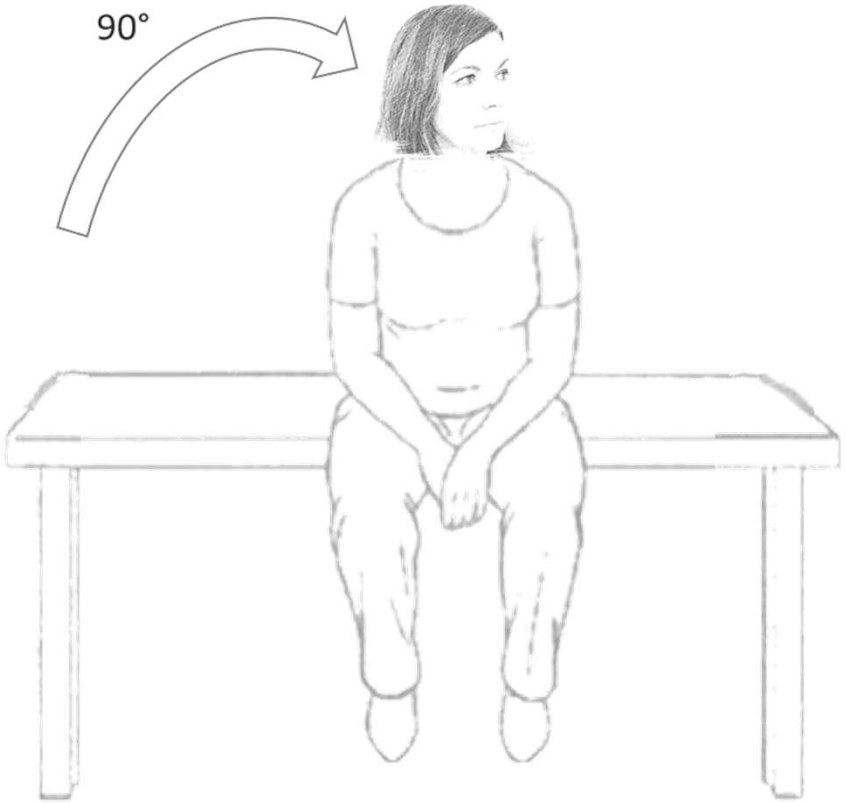
## LARP PLANE (around the $X^{LARP}$ AXIS)



# Bascule maneuver

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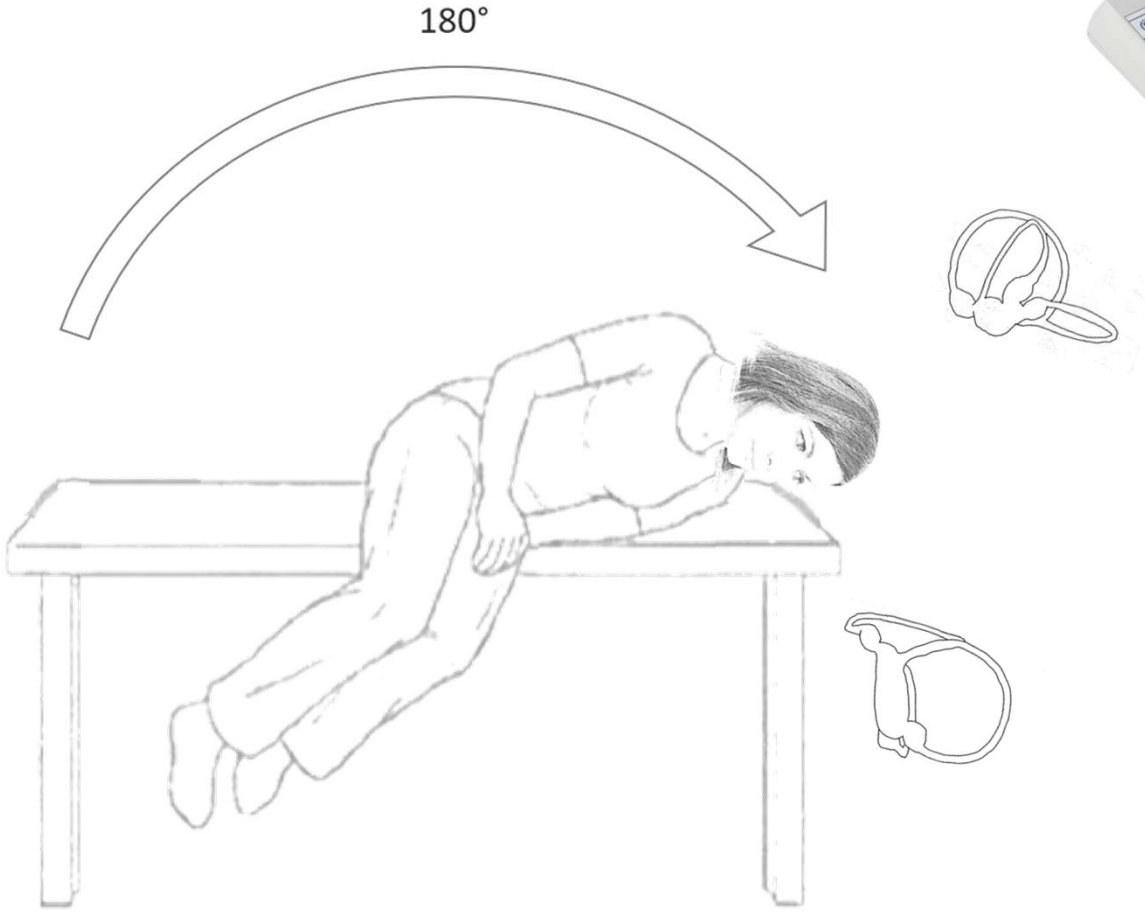


# Bascule maneuver

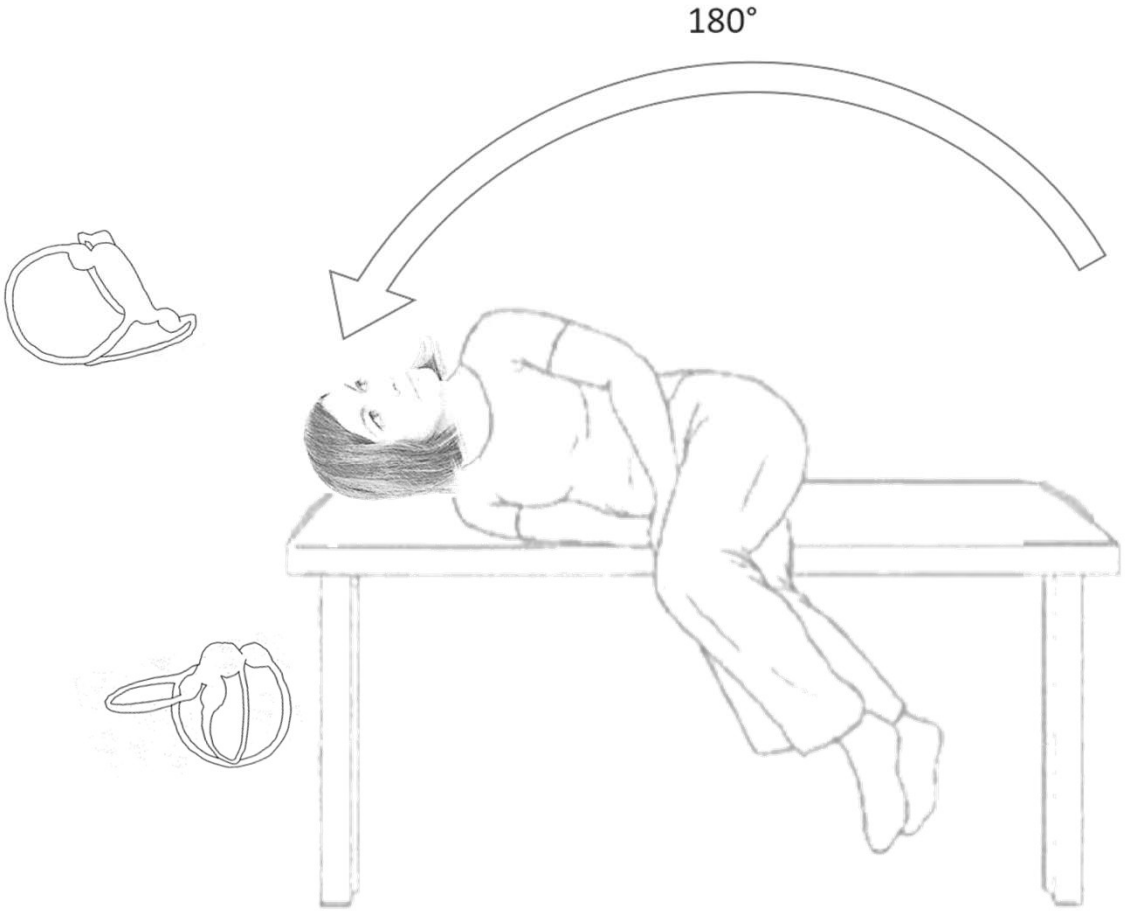
## LARP PLANE (around the $X^{LARP}$ AXIS)



# Bascule maneuver

## LARP PLANE (around the $X^{LARP}$ AXIS)

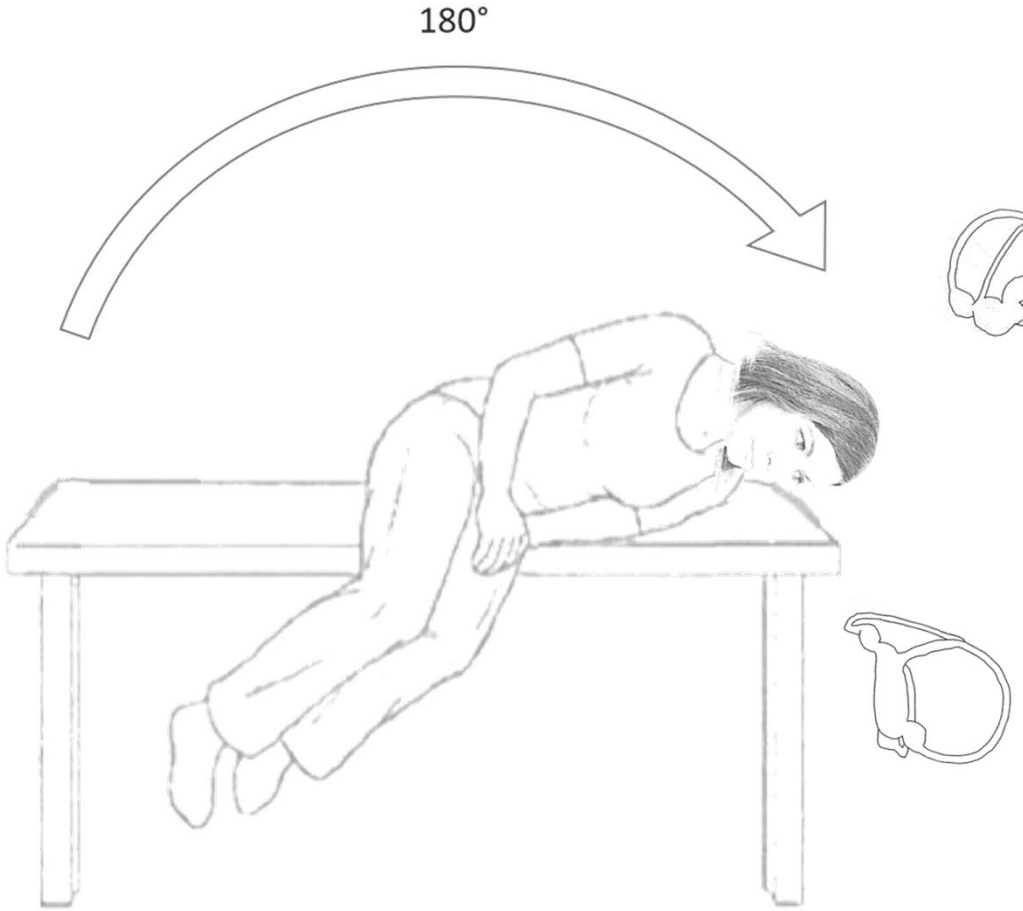





# Bascule maneuver

## LARP PLANE (around the $X^{LARP}$ AXIS)

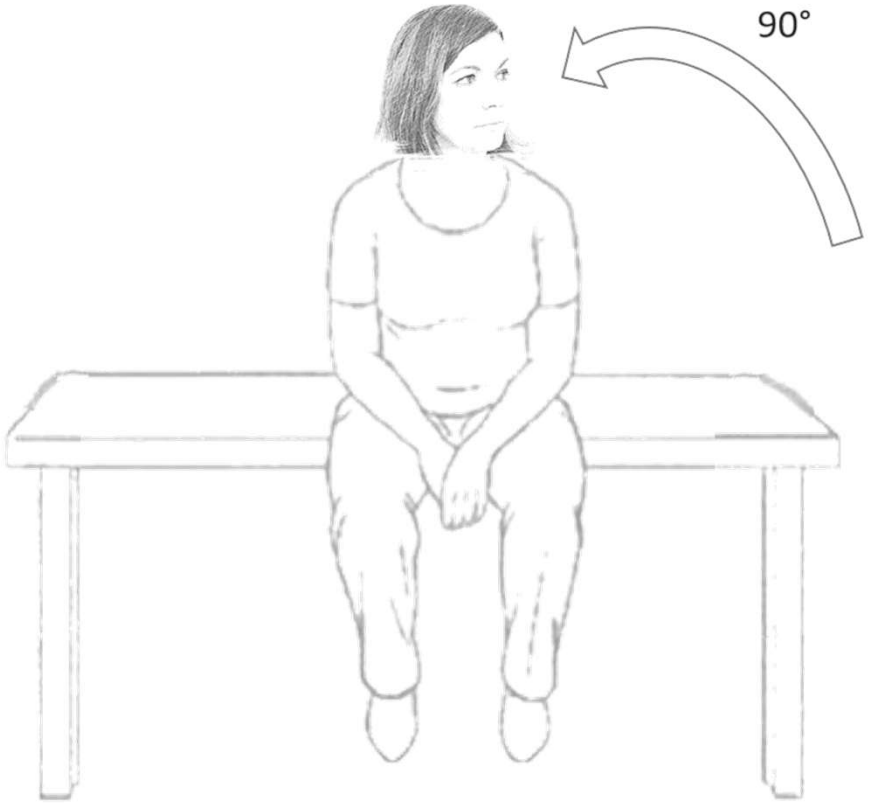


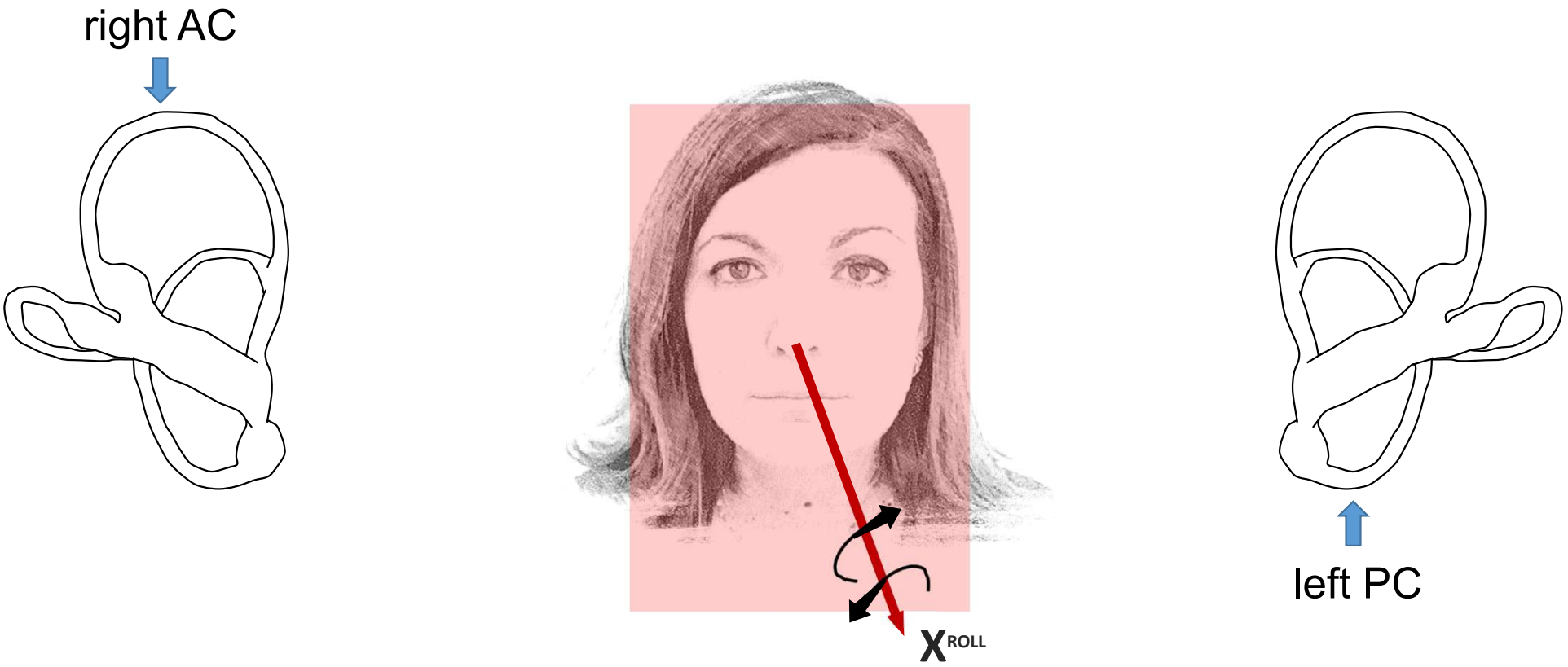
# Bascule maneuver

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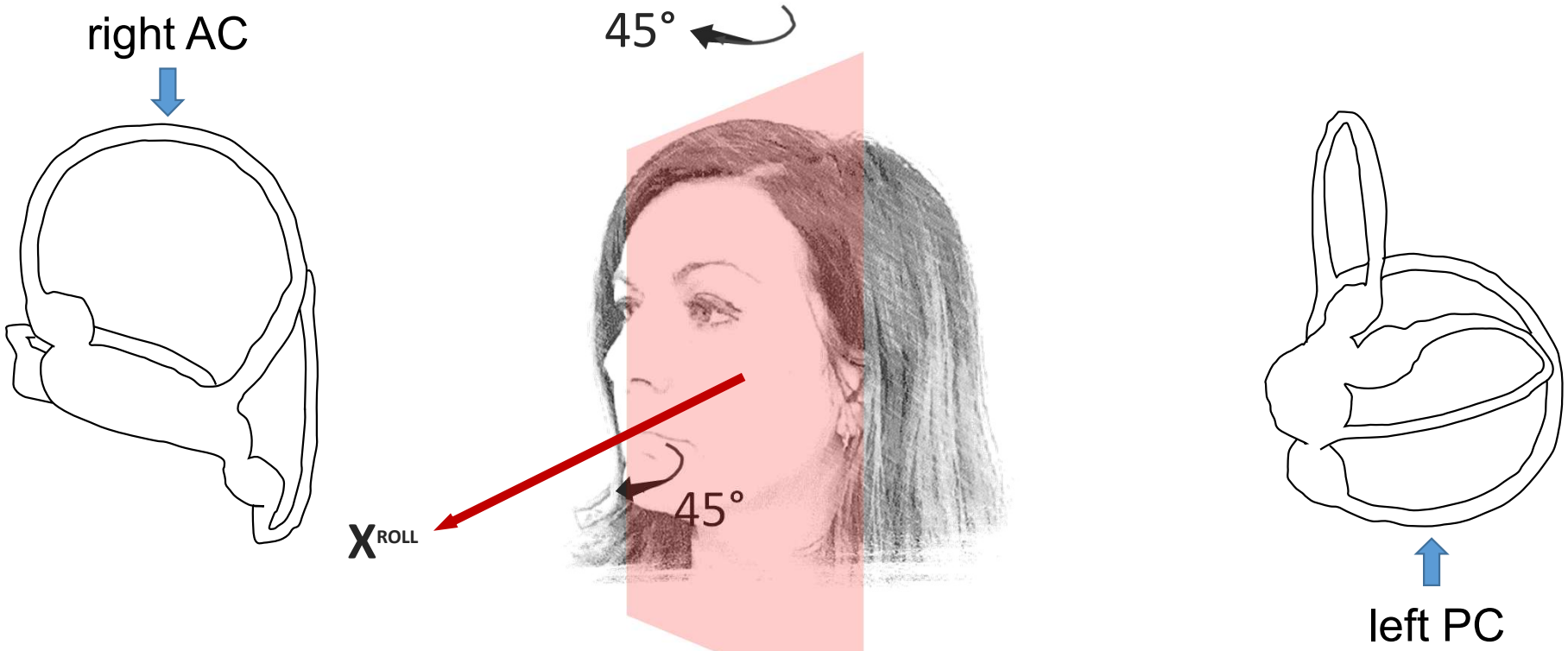


# Spatial planes and axes

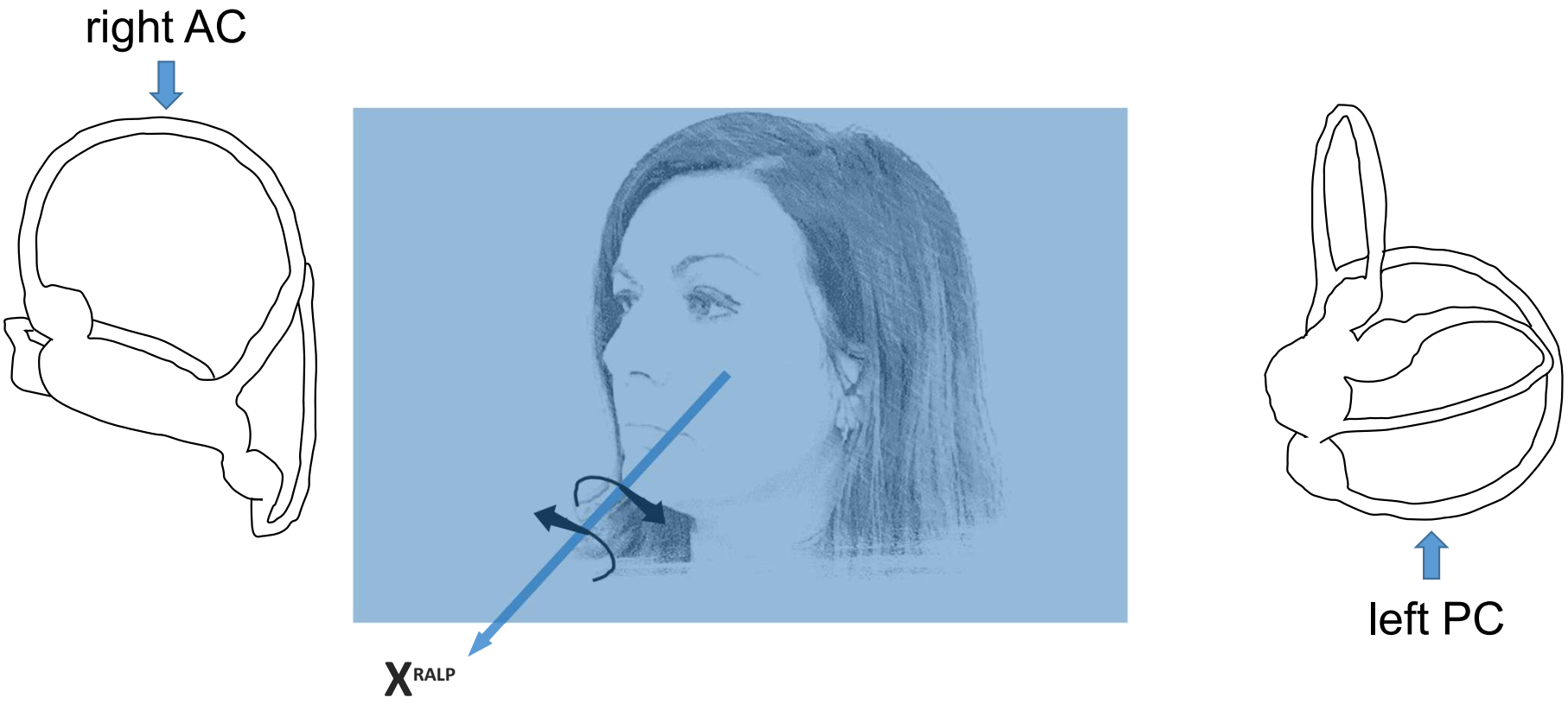


# Spatial planes and axes



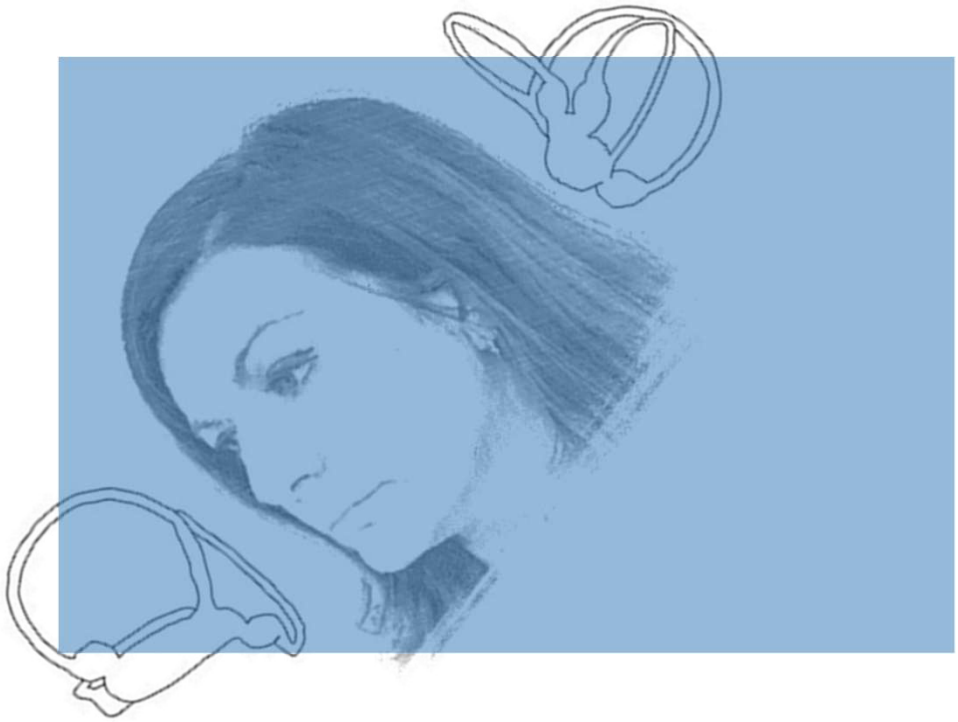
# Bascule maneuver planes and axes

## RALP PLANE (around the $X^{RALP}$ AXIS)



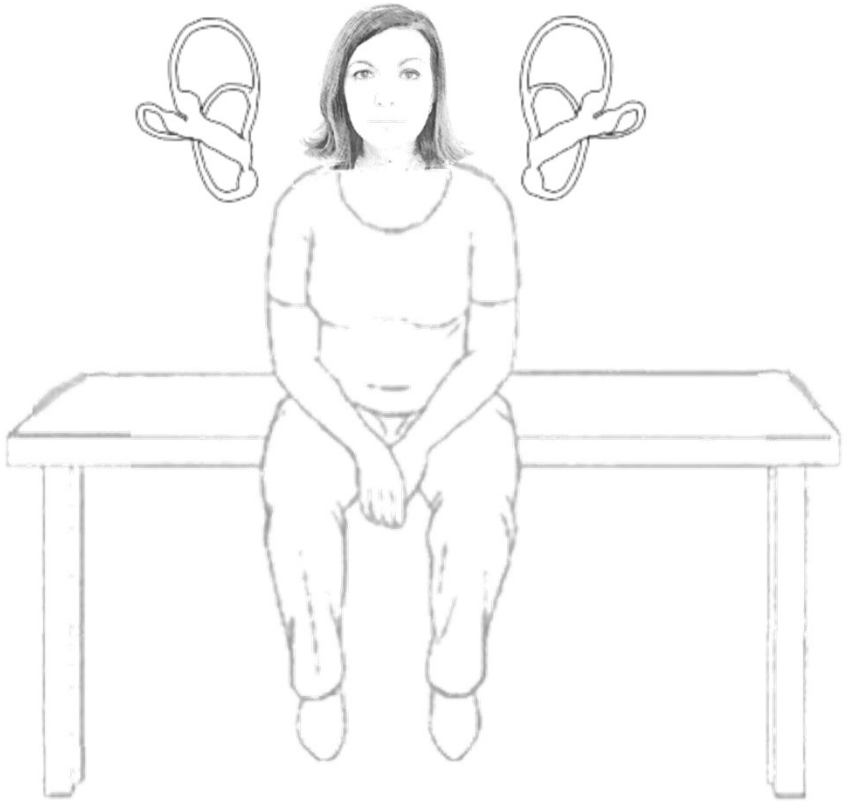
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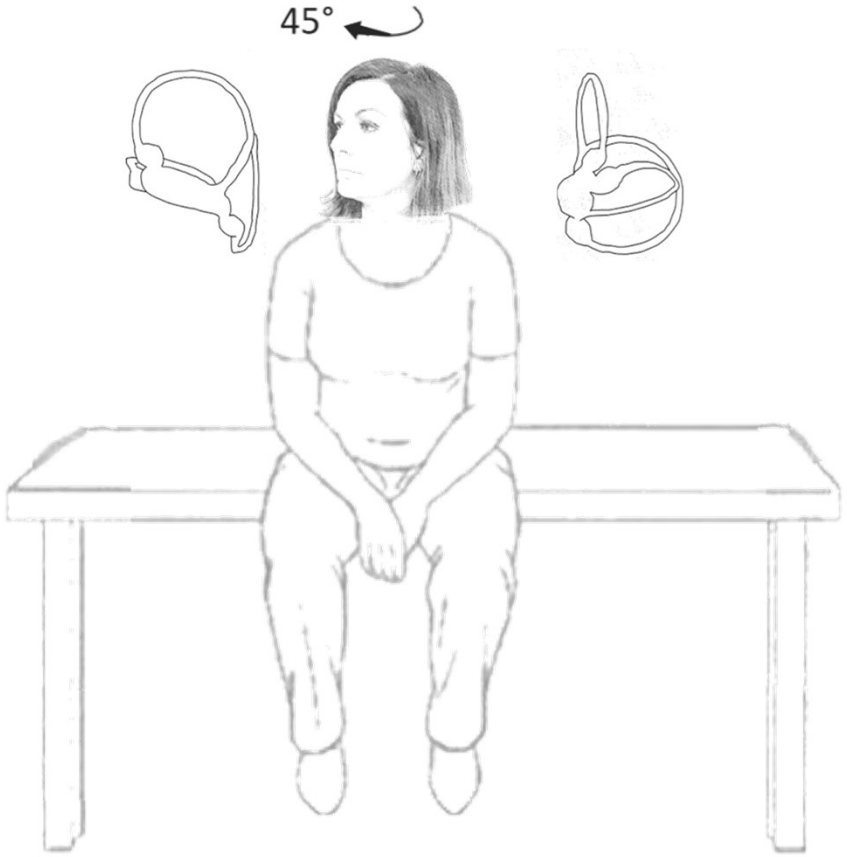
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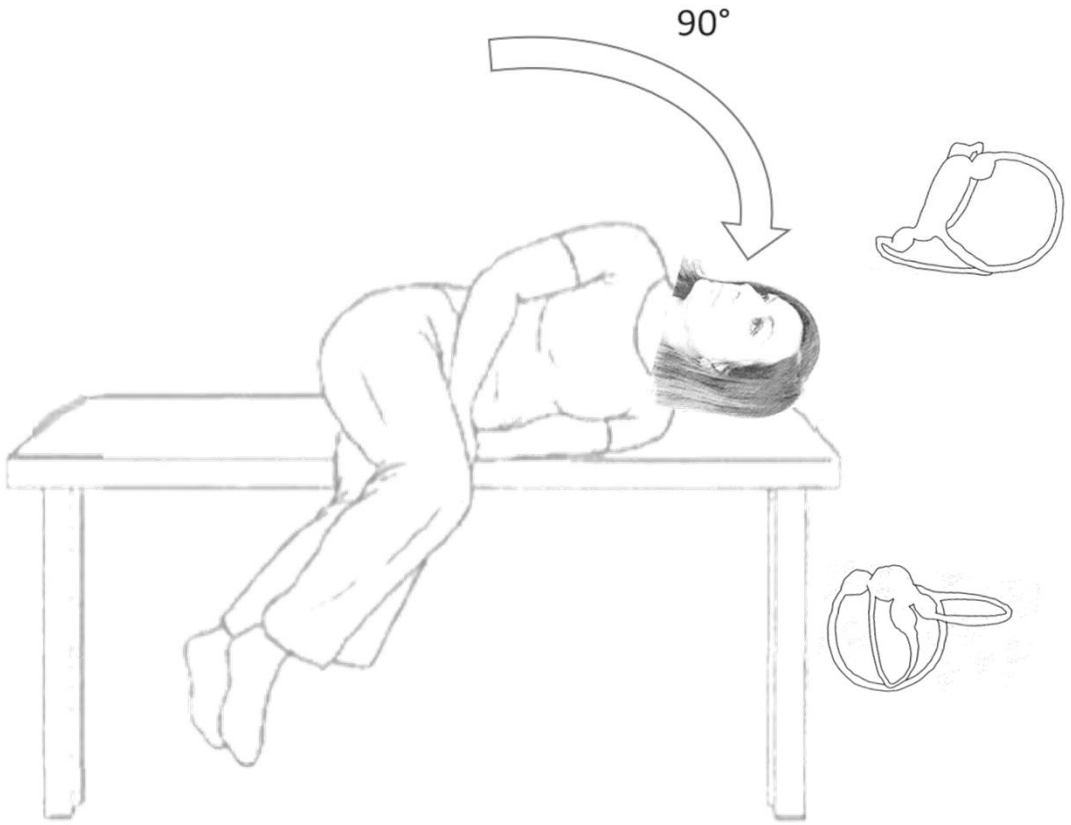
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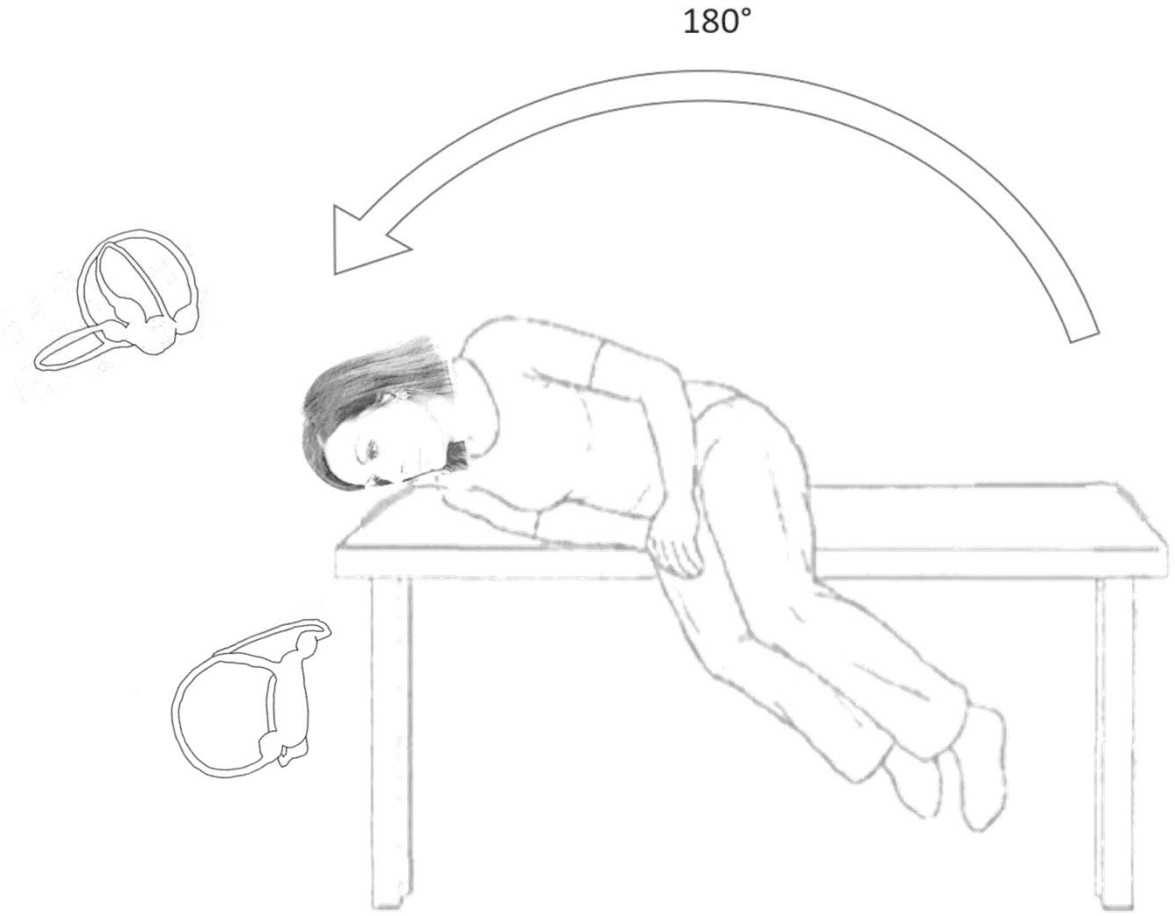
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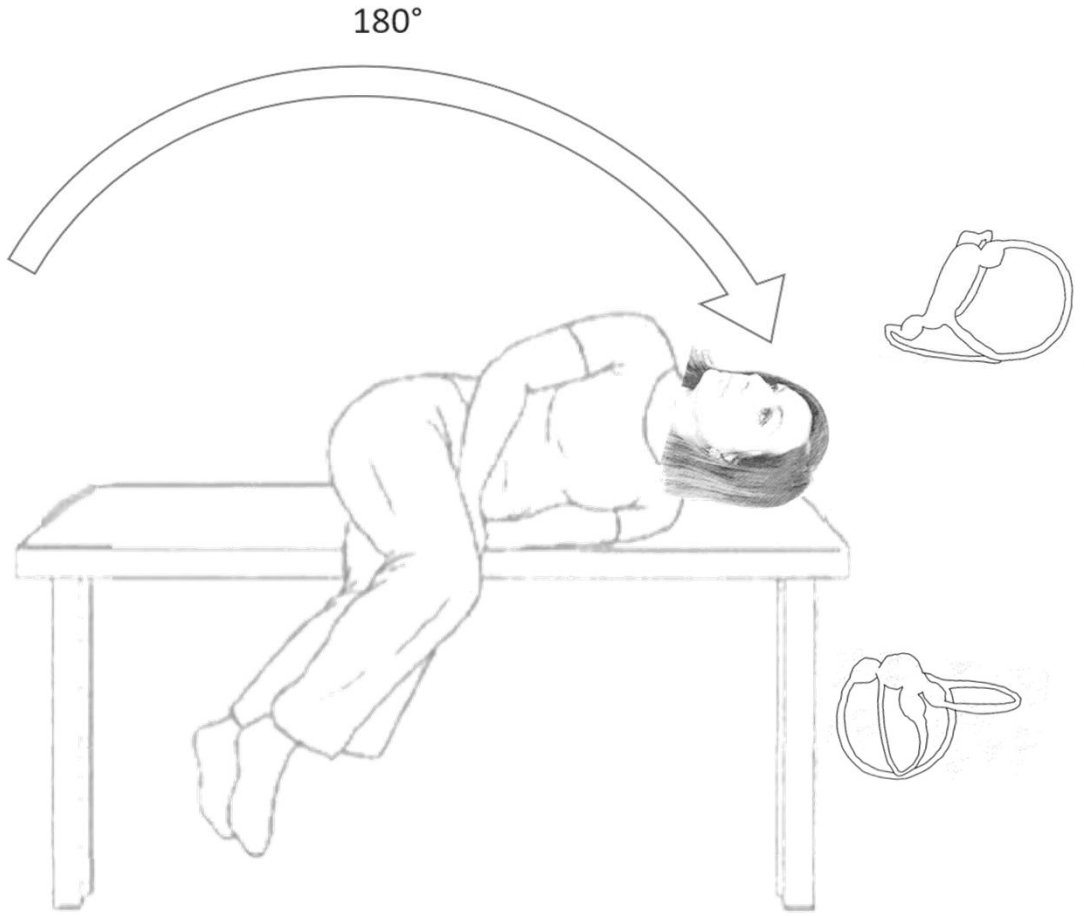
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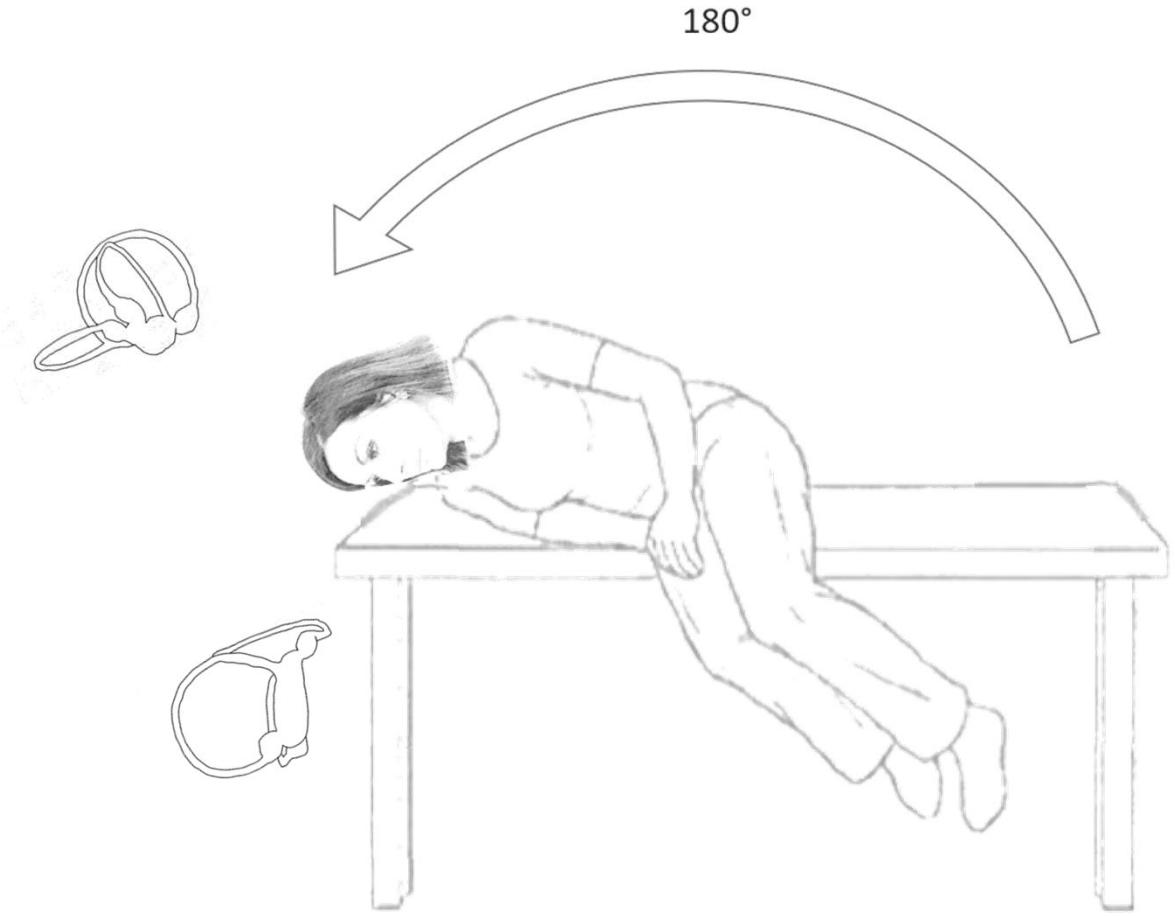
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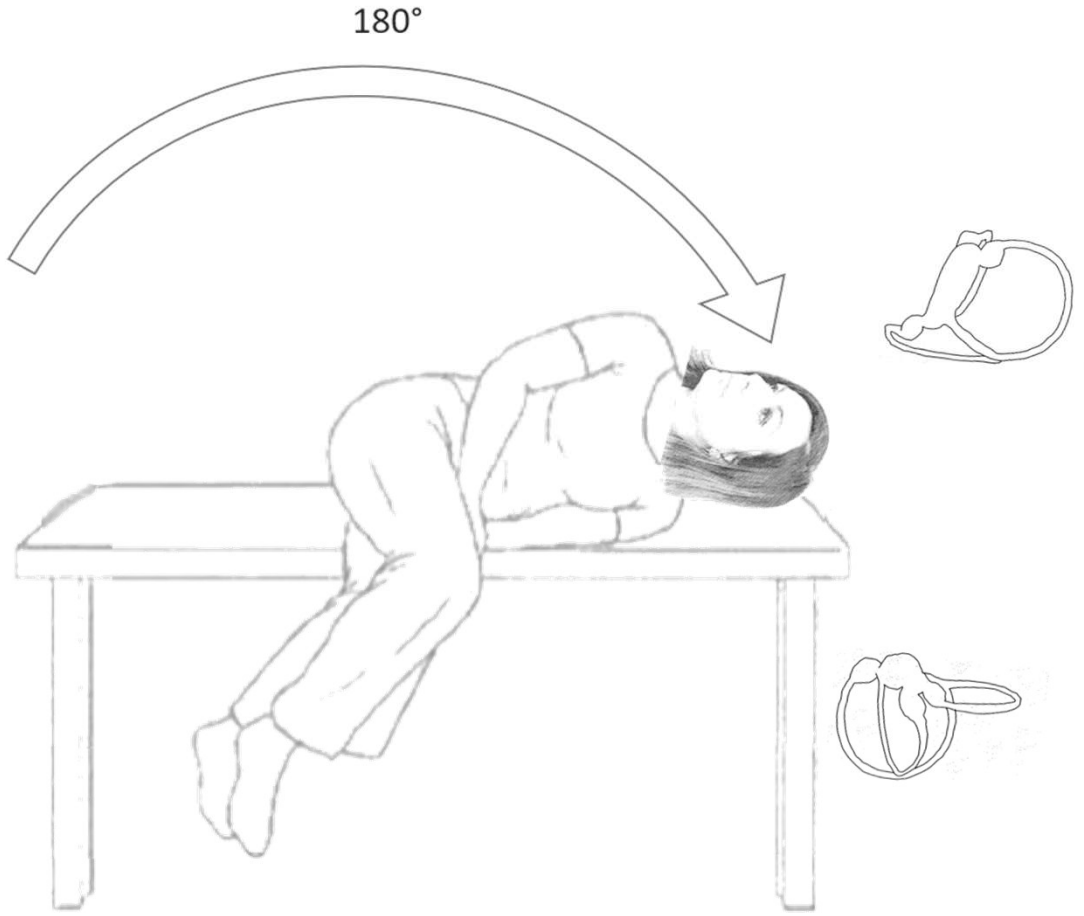
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## RALP PLANE (around the $X^{RALP}$ AXIS)



# Bascule maneuver

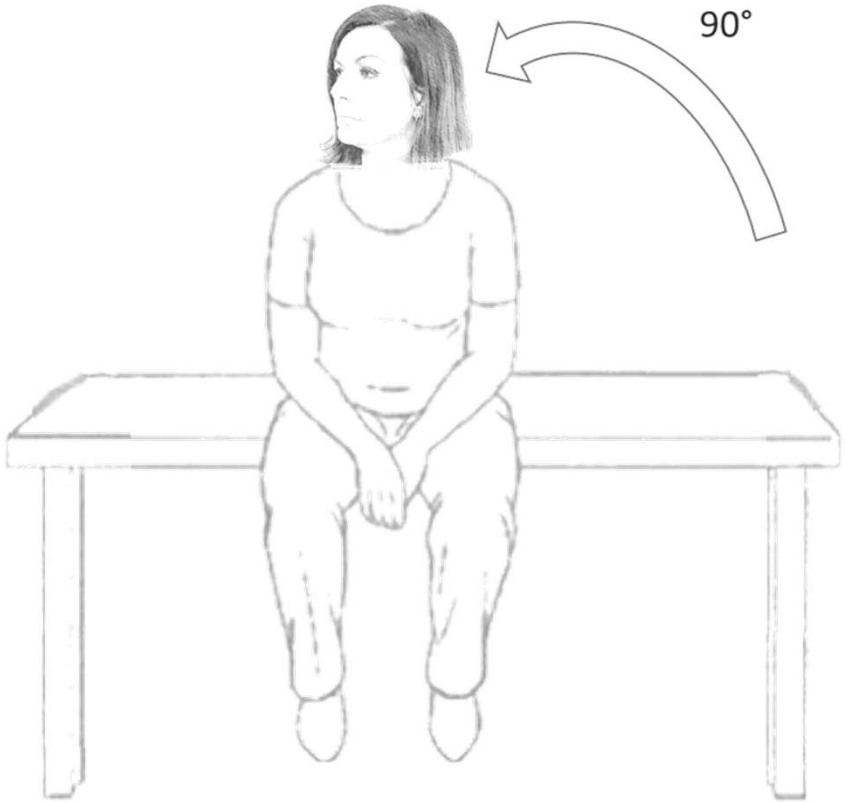
## RALP PLANE (around the $X^{RALP}$ AXIS)



# Bascule maneuver

## RALP PLANE (around the $X^{RALP}$ AXIS)

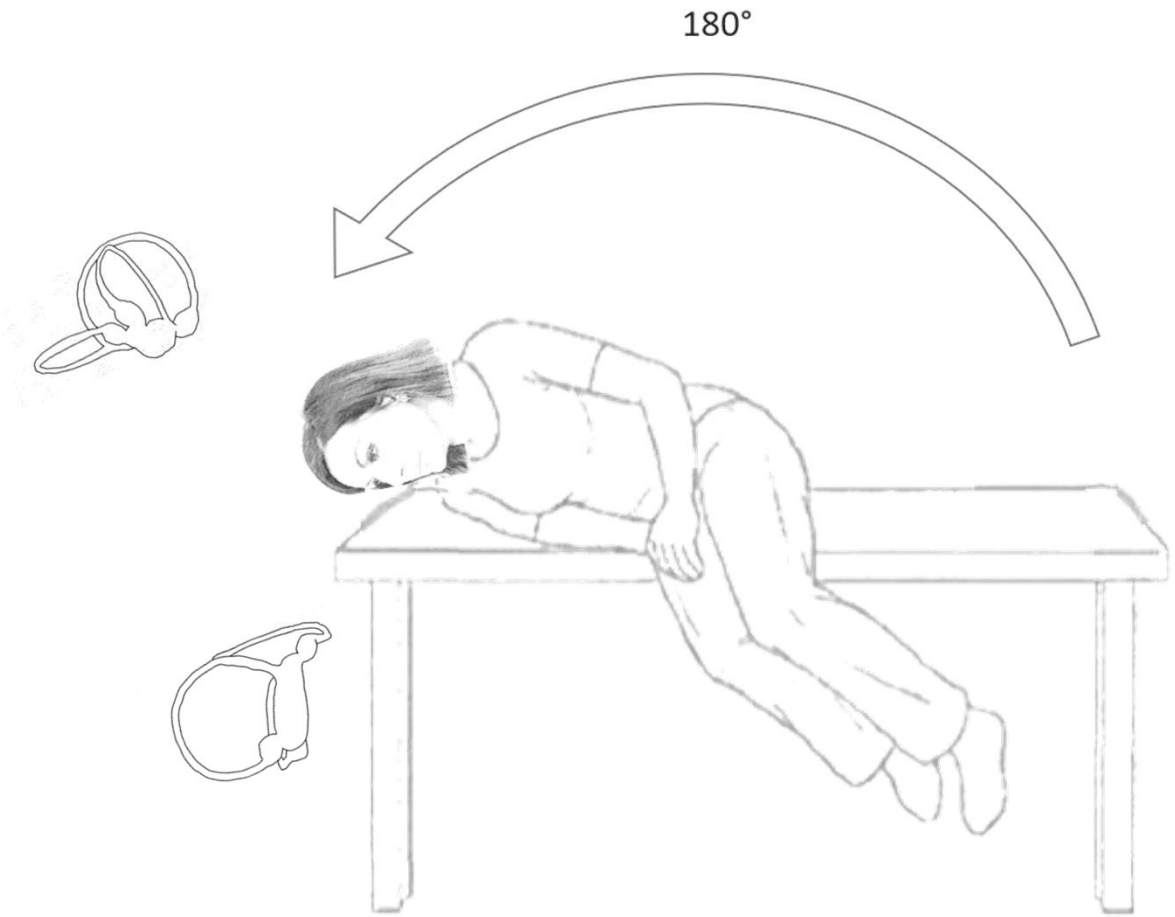


# Bascule maneuver

## RALP PLANE (around the $X^{RALP}$ AXIS)

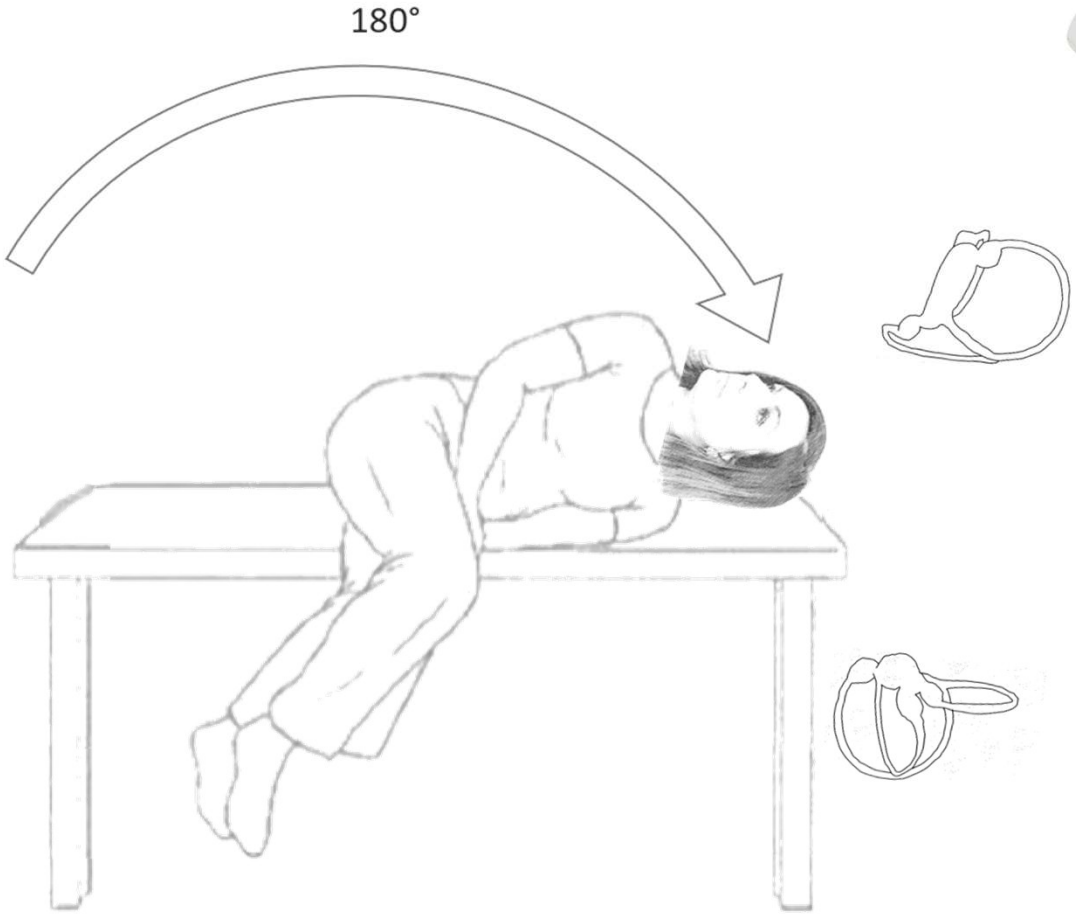


# Bascule maneuver

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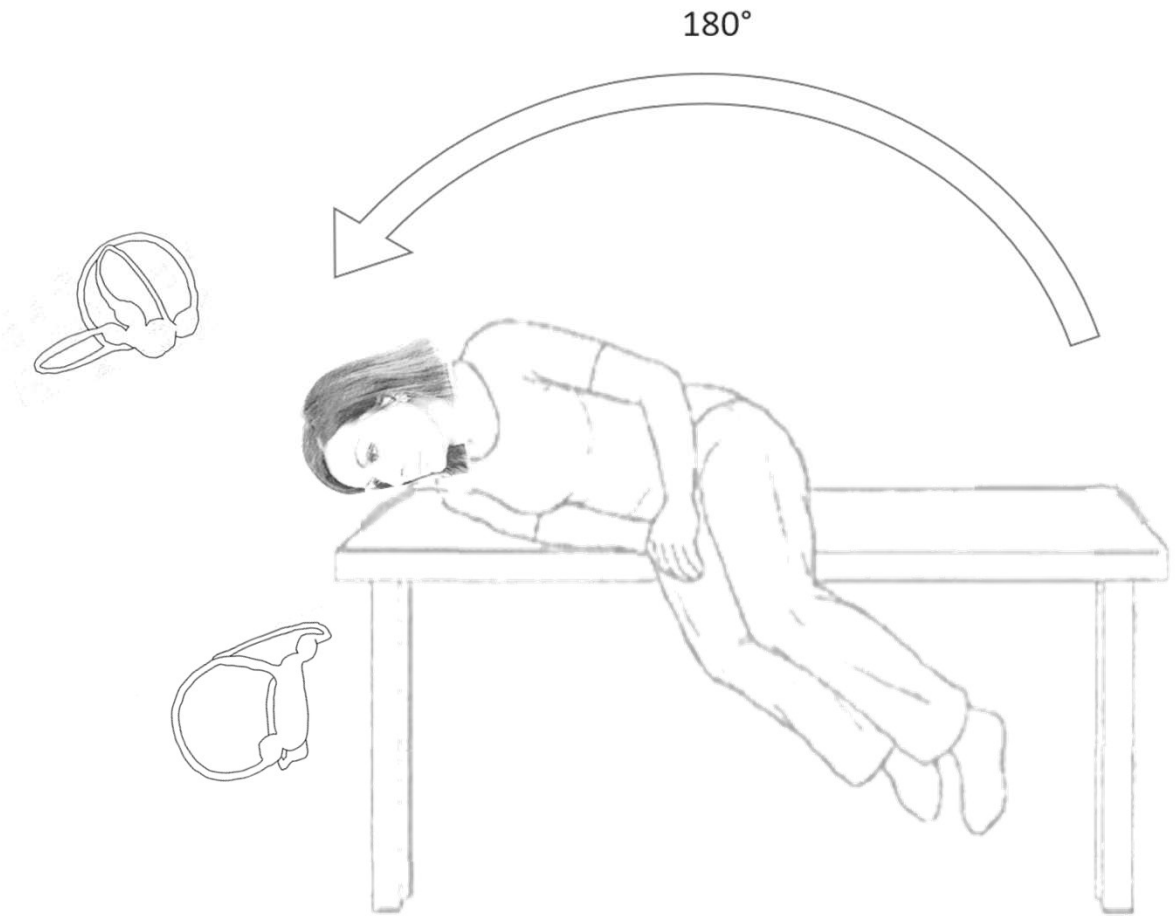


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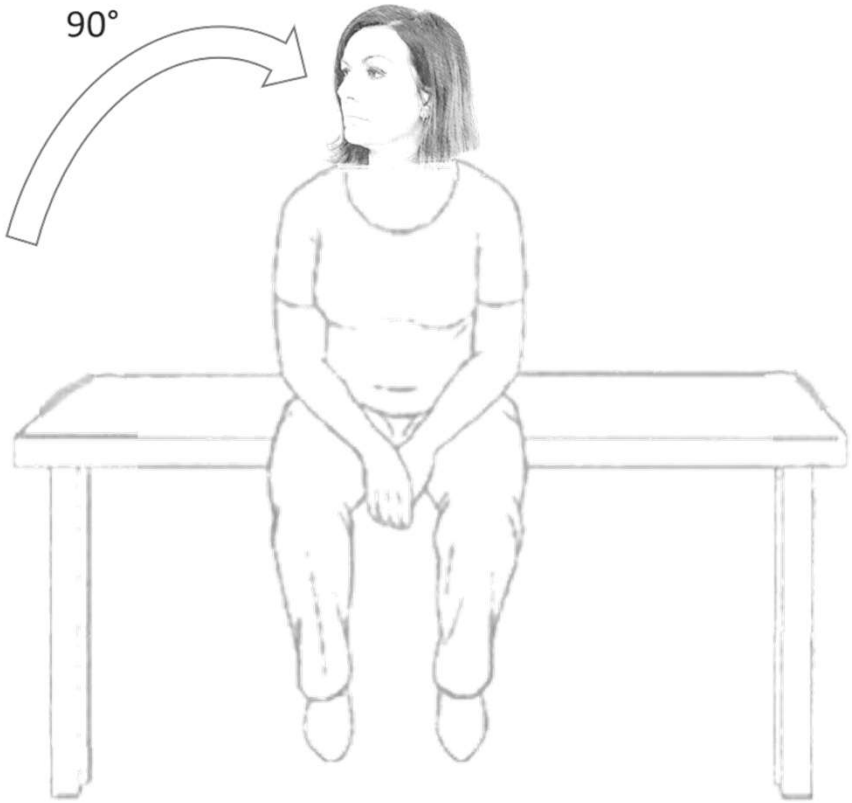


# Bascule maneuver

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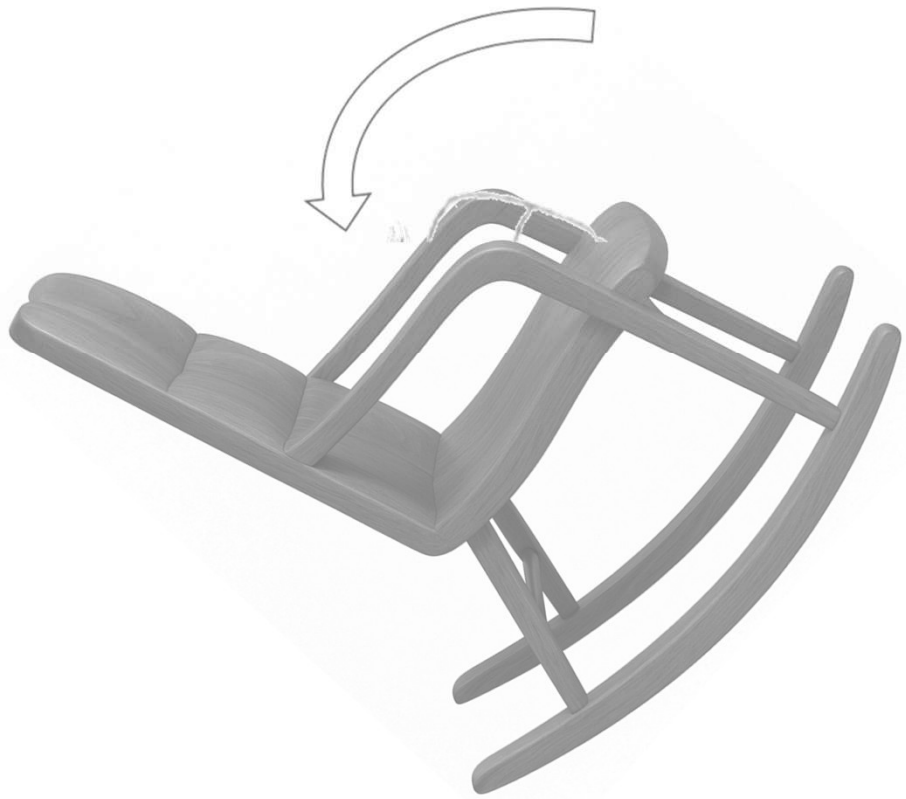


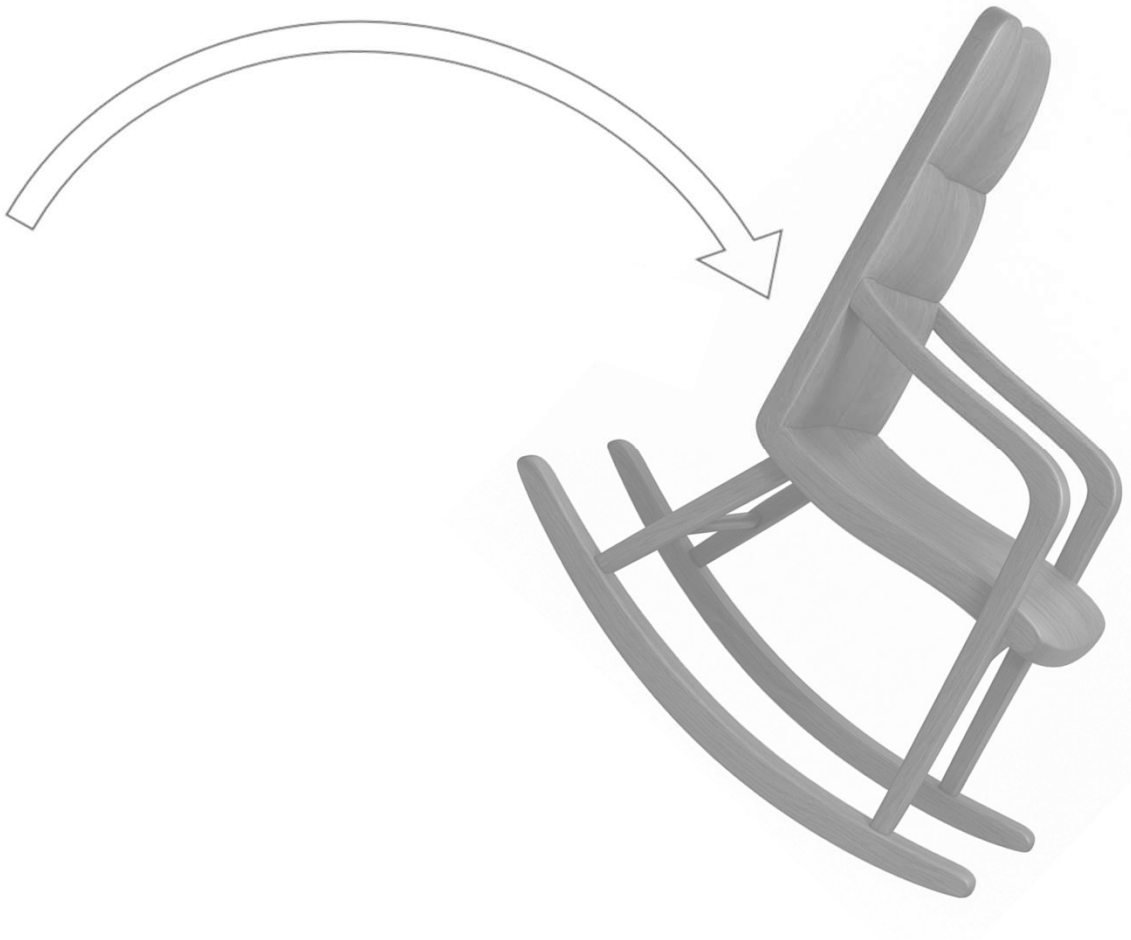
# Bascule maneuver



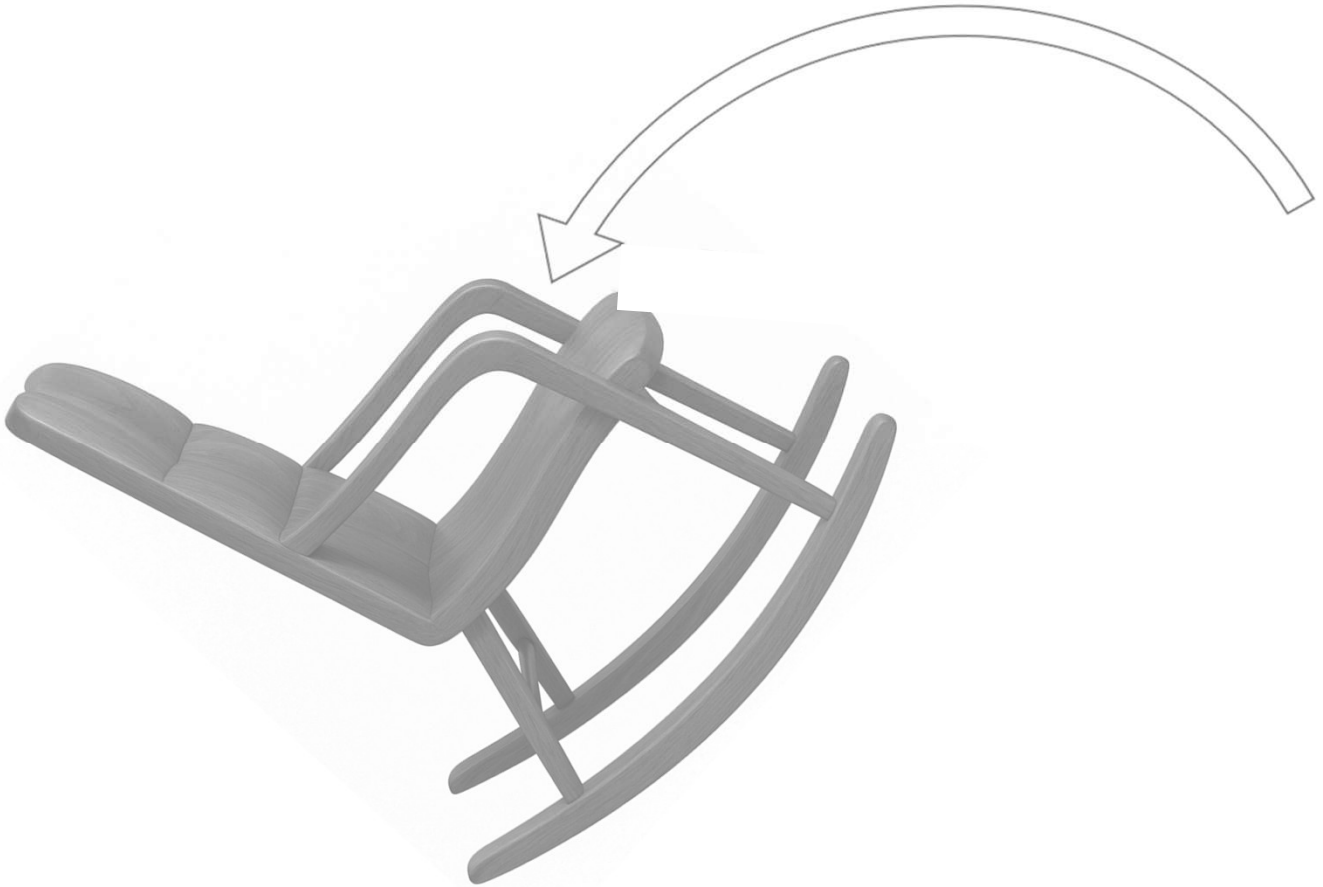
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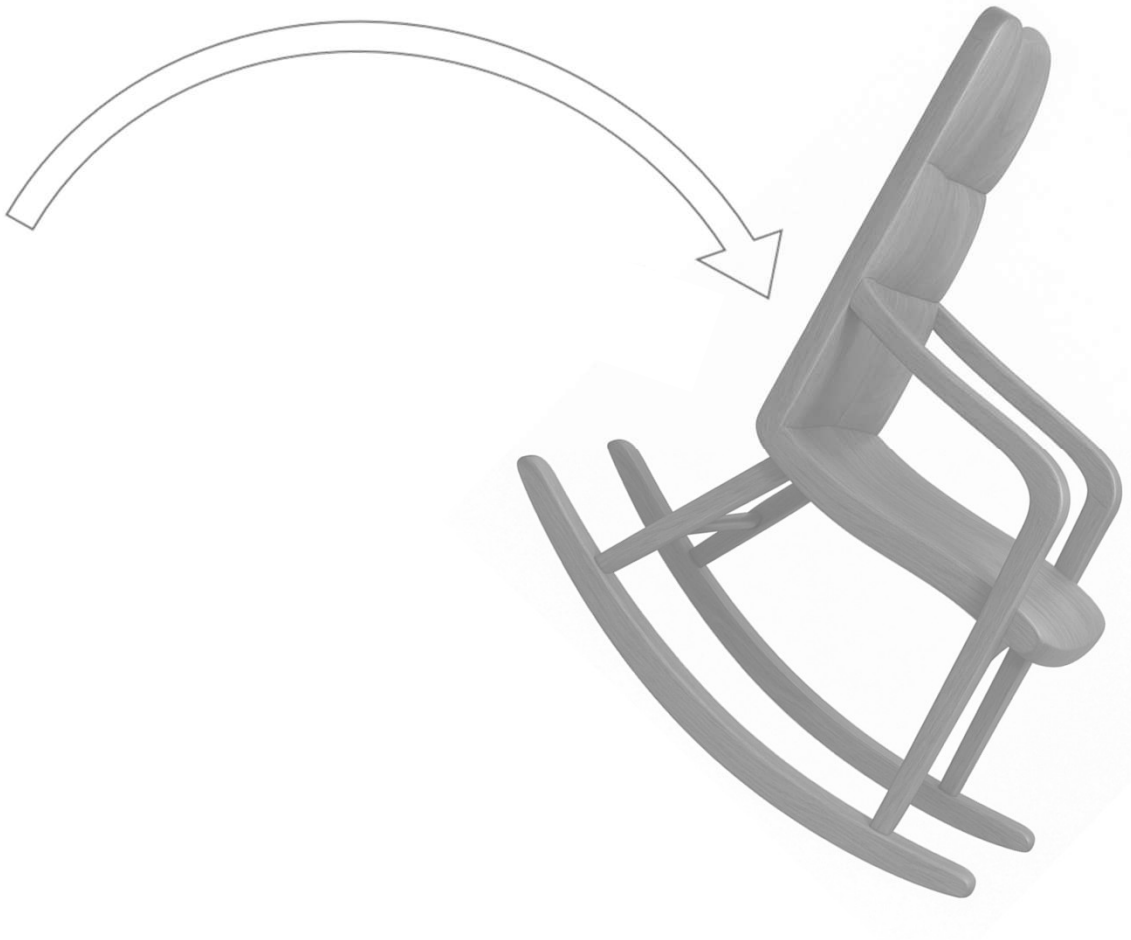
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# Bascule maneuver



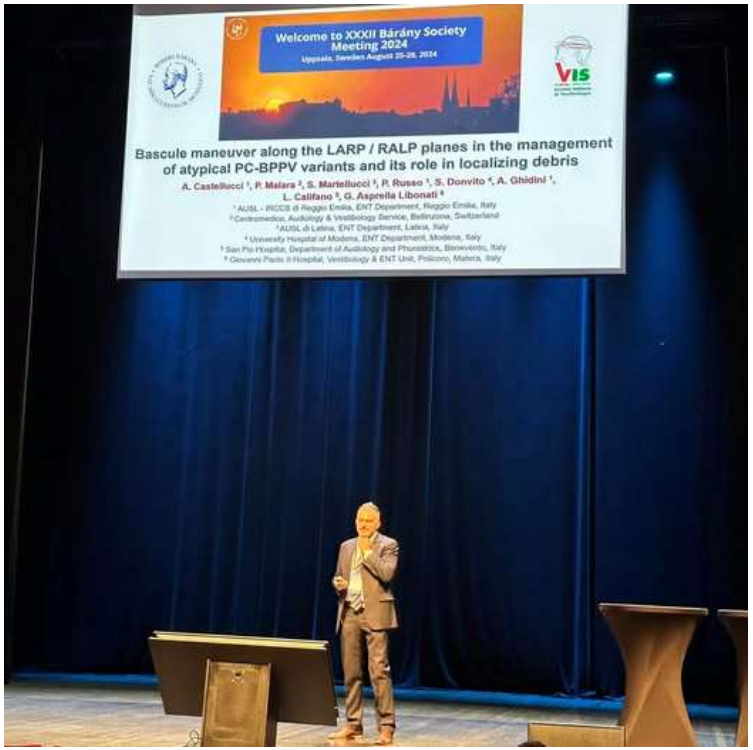
# Bascule maneuver



# Bascule maneuver



# Bascule maneuver




audiology research

MDPI

*Article*

## Bascule maneuver in the management of atypical posterior canal BPPV variants and its role in the localization of debris

**Andrea Castellucci [1]*, Pasquale Malara [2], Salvatore Martellucci [3], Paolo Russo [1], Sara Donvito [1], Luigi Califano [4], Rudi Pecci [5], Giacinto Asprella Libonati [6]**



## Bárány Society Meeting Scientific Abstracts

Journal of Vestibular Research
2024, Vol. 34(5-6) 234–471
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continues with the upright Head Pitch Test (uHPT) by forward and backward head bending along the pitch plane. The uHPT can indicate whether horizontal or vertical semicircular canal is involved. If horizontal canal is suspected, the upright Head Roll Test (uHRT) usually provides the diagnosis of the involved side and arm by tilting the patient's head rightward and leftward along the roll plane. Conversely, canalolithiasis involving the posterior semicircular canal can be diagnosed with the uHPT alone. Nevertheless, if necessary, the diagnostic sensitivity can be increased by head movements along the right anterior – left posterior (RALP) and left anterior – right posterior (LARP) canal planes (uRALP/uLARP test). Our multicenter experience is reported.

**Conclusions:** Following the UBP, most BPPV form can be diagnosed in upright position, allowing clinicians to proceed immediately with proper physical treatment and avoiding unpleasant maneuvers to patients.

### *Bascule maneuver along LARP/RALP planes in the management of atypical PC-BPPV variants and its role in localizing debris*

**Andrea Castellucci**[1], Pasquale Malara[2], Salvatore Martellucci[3], Paolo Russo[1], Sara Donvito[4], Angelo Ghidini[1], Luigi Califano[5], Giacinto Asprella Libonati[6]
[1]AUSL - IRCCS di Reggio Emilia, ENT Department, Reggio Emilia, Italy
[2]Centromedico, Audiology & Vestibology Service, Bellinzona, Switzerland
[3]AUSL di Latina, ENT Department, Latina, Italy
[4]University Hospital of Modena, ENT Department, Modena, Italy
[5]San Pio Hospital, Department of Audiology and Phoniatrics, Benevento, Italy
[6]Giovanni Paolo II Hospital, Vestibology & ENT Unit, Policoro, Matera, Italy

**Purpose:** While typical posterior canal (PC)-BPPV is successfully managed with standard repositionings, atypical variants, where otoconia settle in uncommon/stenotic canal tracts generating unusual positional nystagmus, are usually refractory and their management is still debated. They include PC-cupulolithiasis, apogeotropic PC-BPPV, sitting-up vertigo and PC-canalith jam. Impulsive maneuvers might be beneficial. While Brandt-Daroff exercises aim to disperse debris using random rotations, we designed a tailored impulsive maneuver along the affected canal plane (LARP or RALP), aiming to treat these variants or to convert them in typical forms, thus allowing to localize otoconia in uncertain cases.

**Methods:** Once placed the patient in the 1st(45°-face-up on the affected side) and then in the 2nd Semont position (45°-face-down on the healthy side), he is then briskly and repeatedly "basculed" side-to-side in a pendular fashion (up-to 5 times per session) with the same head direction (along the LARP or RALP plane) until variation or receding of positional nystagmus.

127 patients (33 males, 94 females, mean age 61.9±12.4 years) with atypical PC-BPPV or anterior canal (AC)-BPPV were prospectively "basculed" along the LARP (75 cases) and RALP (52 cases) planes. 42 subjects had PC-cupulolithiasis, 35 apogeotropic PC-BPPV, 35 sitting-up vertigo, 9 refractory PC-BPPV, 3 canalith jam and 3 AC-BPPV.

**Results:** BPPV directly resolved in 44 cases, while it converted into a typical variant in 63 cases (PC-BPPV in 38, lateral canal-BPPV in 22, AC-BPPV in 3) either in the same session or in the following evaluations, thus allowing to detect the original otolith position in most PC-cupulolithiasis and sitting-up variants (utricular side in 44 cases, long-arm side in 27 cases). In 85% of the remaining uneventful 20 cases, a coexistent ipsilesional vestibular migraine/Meniere's disease was detected, revealing a possible buoyancy mechanism mimicking atypical PC-BPPV.

**Conclusions:** From our preliminary data, the "bascule maneuver" seems to represent a promising management for atypical PC-BPPV.

### *Benign positional paroxysmal vertigo and its relation with gravity and canal jamming*

**Haider Alsarhan**[1]
[1]College of medicine / mustansiriyah University – IRAQ

**Purpose:** is understanding of the nystagmus pattern induced by the presence of otoconias in a specified semicircular canal.

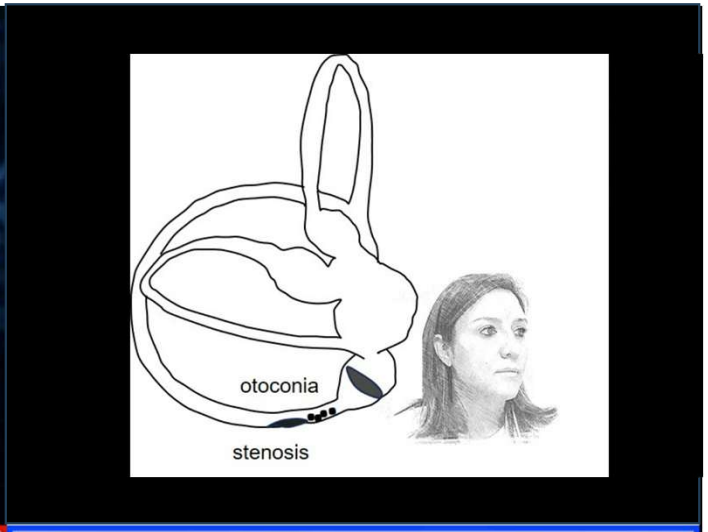
**Methods:** otoconias when freely moving in the lumen of the semi-circular canal usually induced by the gravitational force produced by a head movement which will lead to movement of the otoconias to the most dependent part of the canal; This can be highly affected and interrupted by the presence of canal jam that interferes with the normal gravitational flow of these otoconias; the presence of canal jam should be documented by specific findings in the vestibular tests battery otherwise the diagnosis of BPPV is highly questionable and other causes of positional vertigo should be assessed and accordingly nystagmus induced should not be considered as otoconia-related nystagmus and other forms should be looked for like migrainous positional nystagmus or central positional nystagmus.

**Results:** Results of video-oculo-graphy recordings along with other vestibular testing results for more than 8 patients will be demonstrated according to the time slot allowed by the organizers.

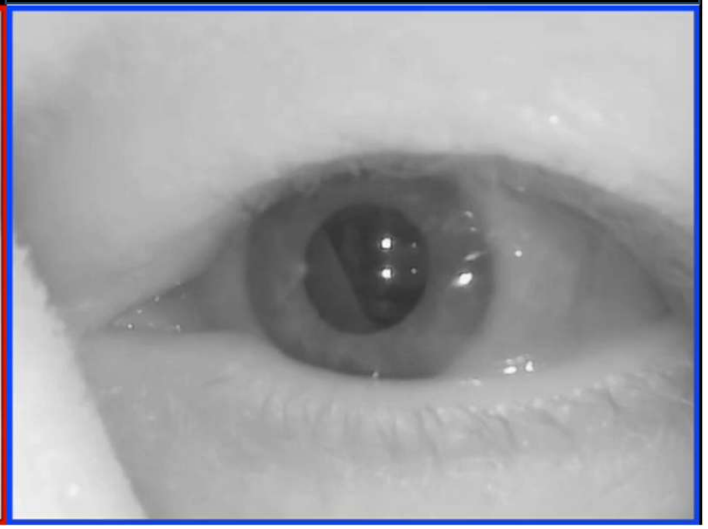
**Conclusions:** understanding these 2 factors in testing the nystagmus pattern can significantly increase the accuracy of

# Sitting up variants

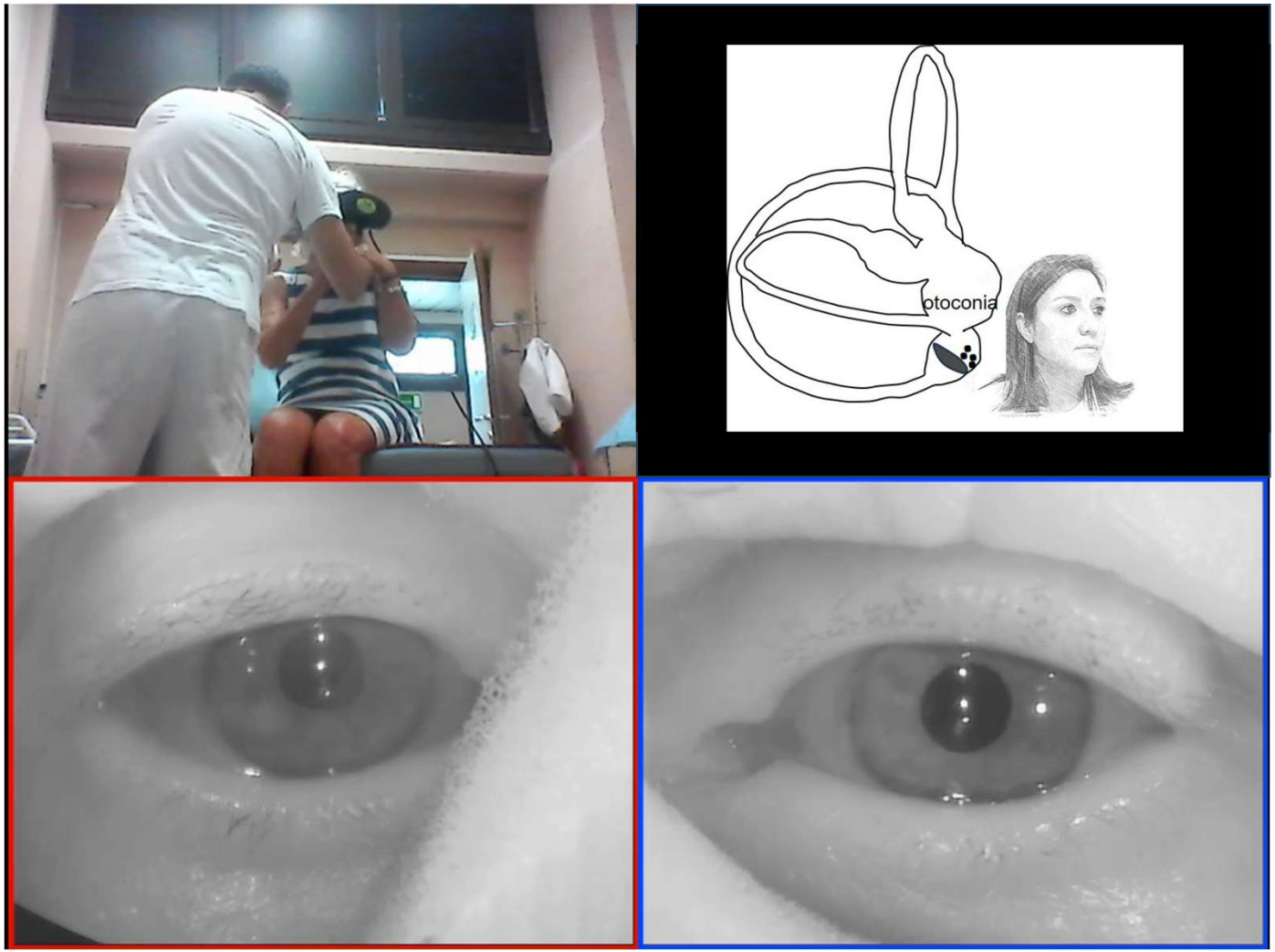






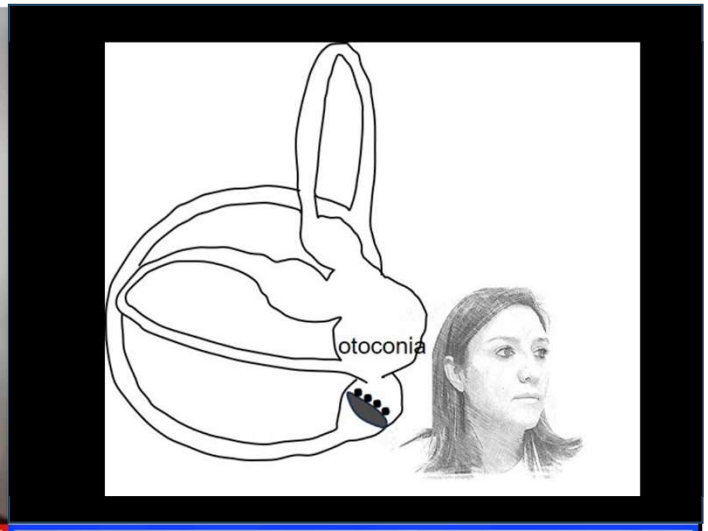



# Sitting up variants



# PC cupulolithiasis

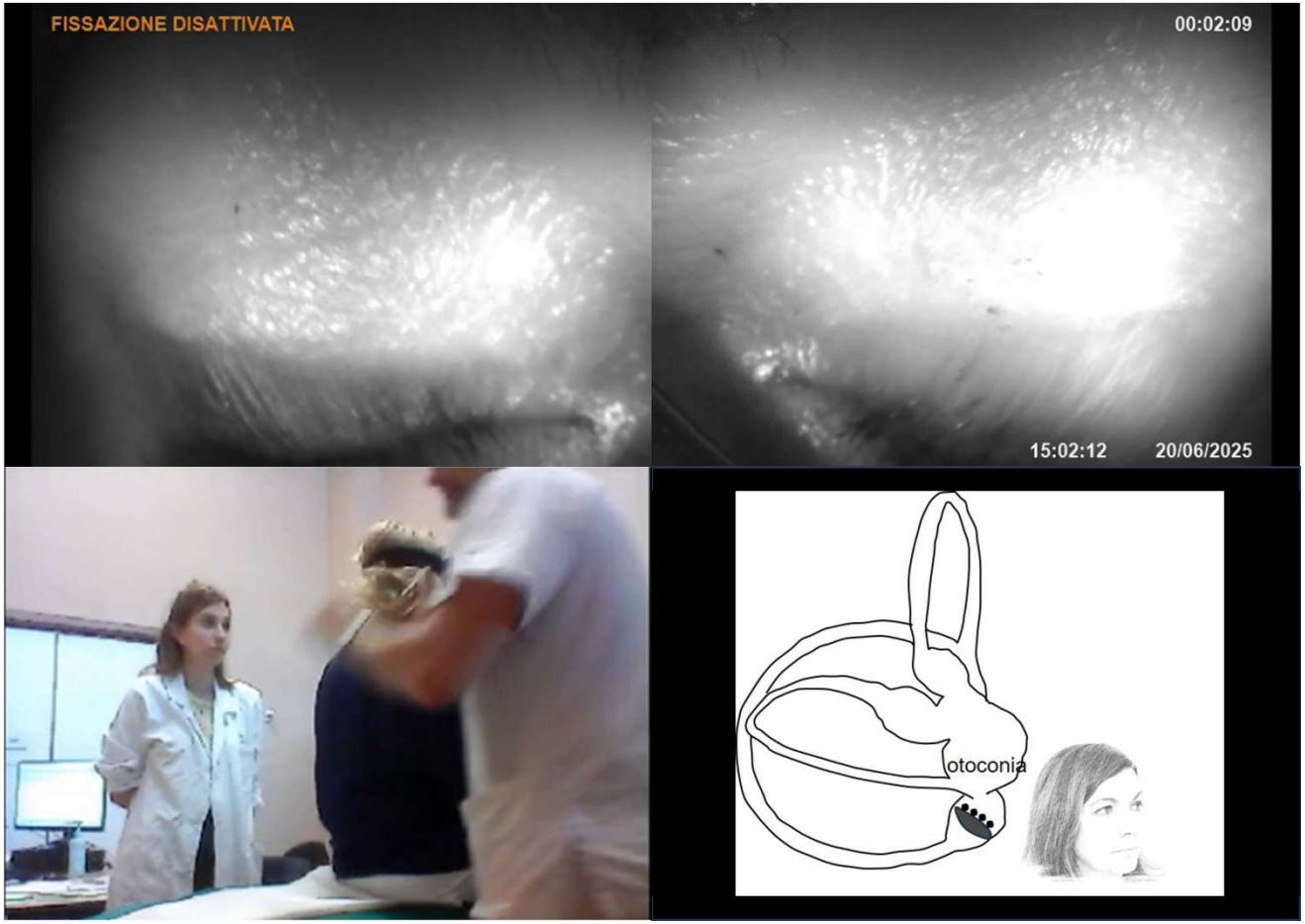




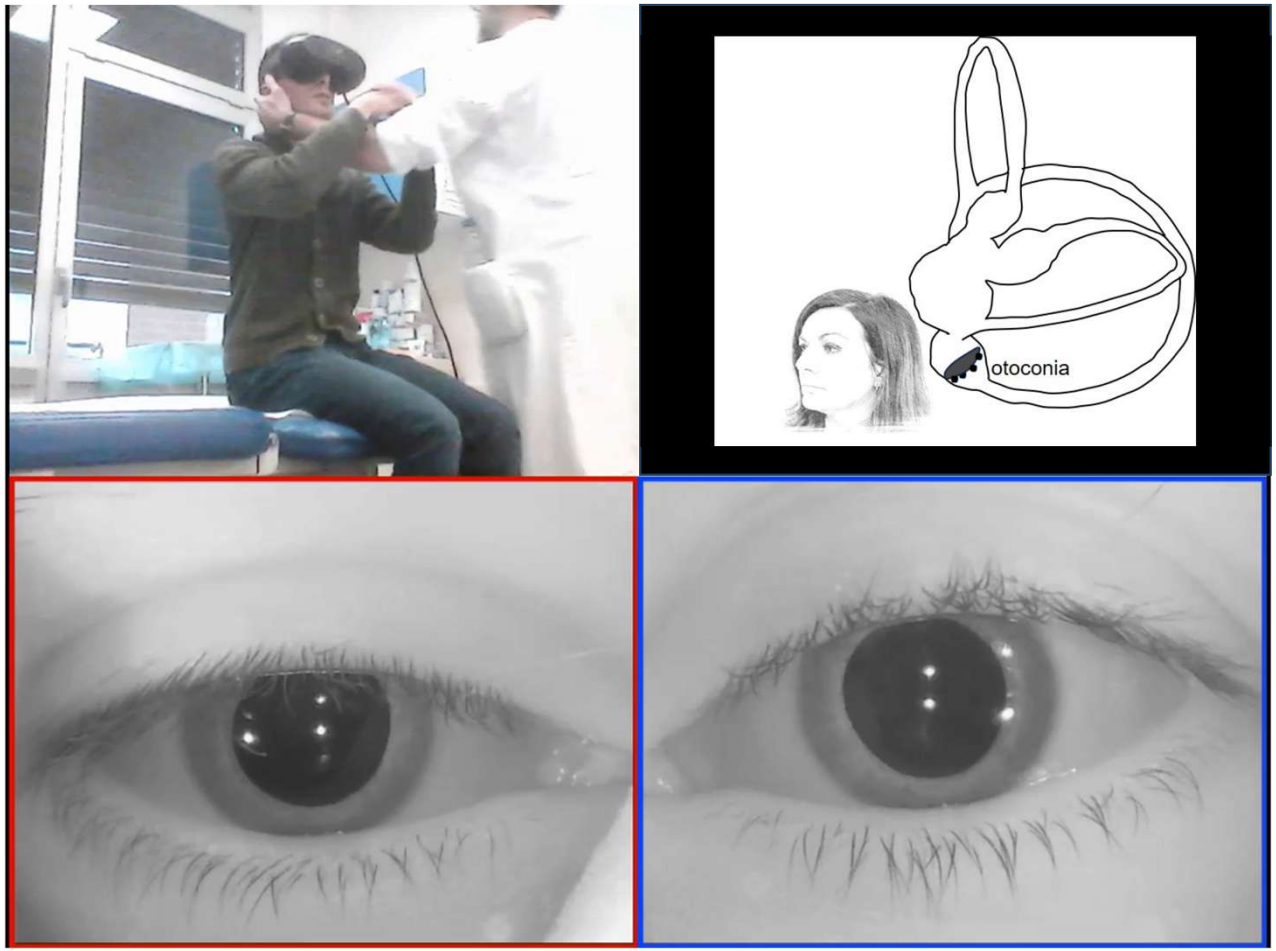




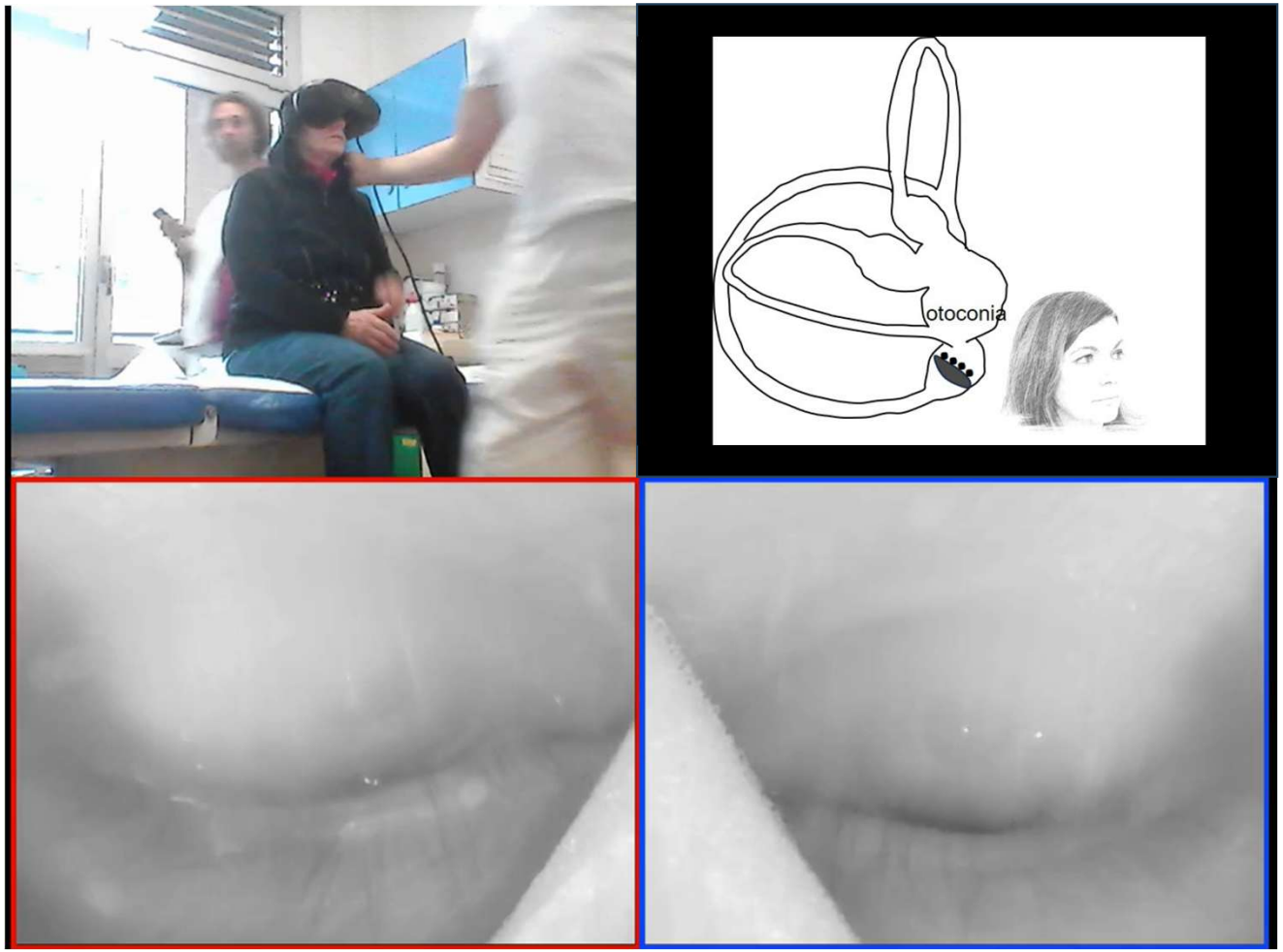

# PC cupulolithiasis



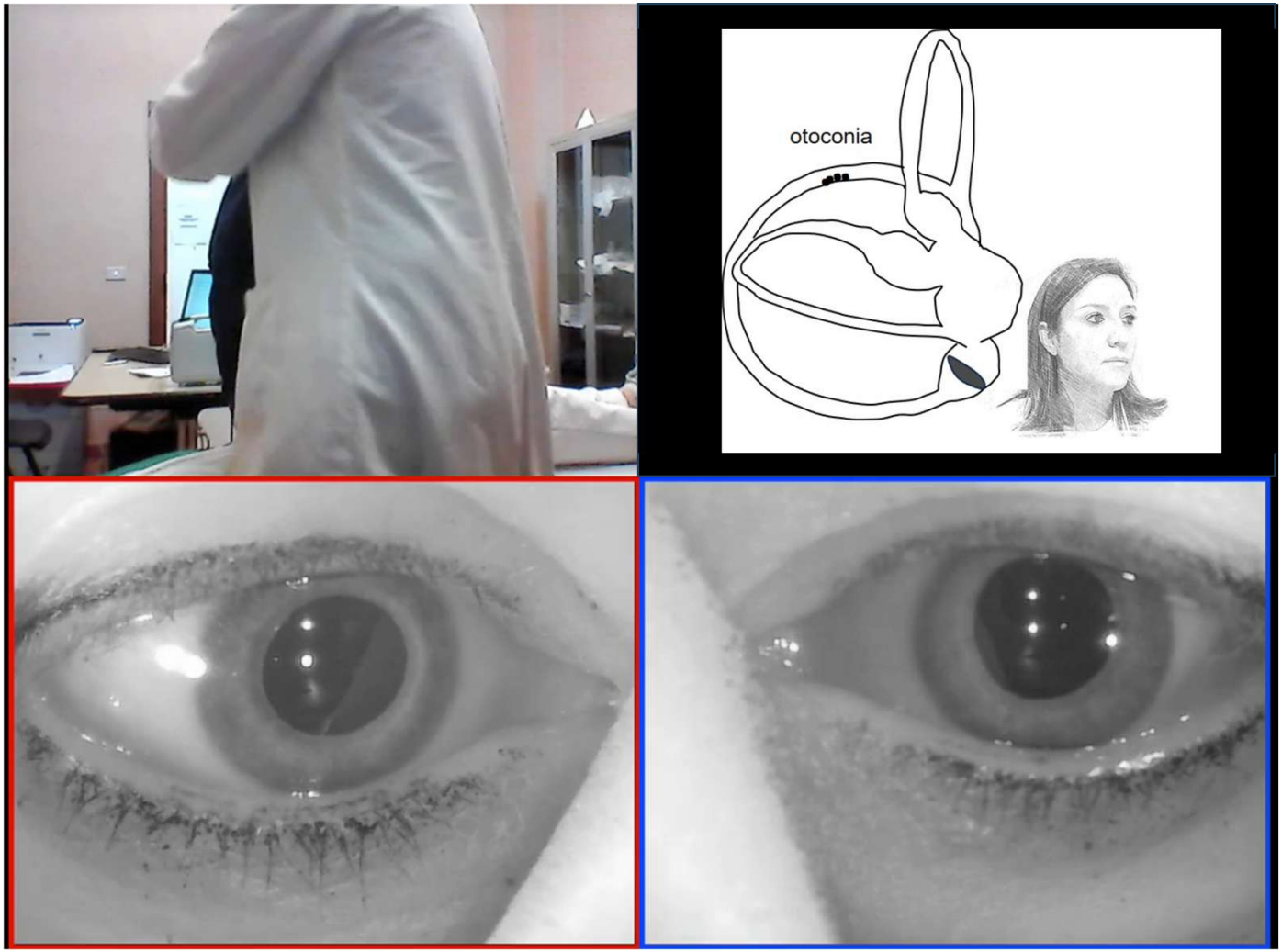
# PC cupulolithiasis



# PC cupulolithiasis

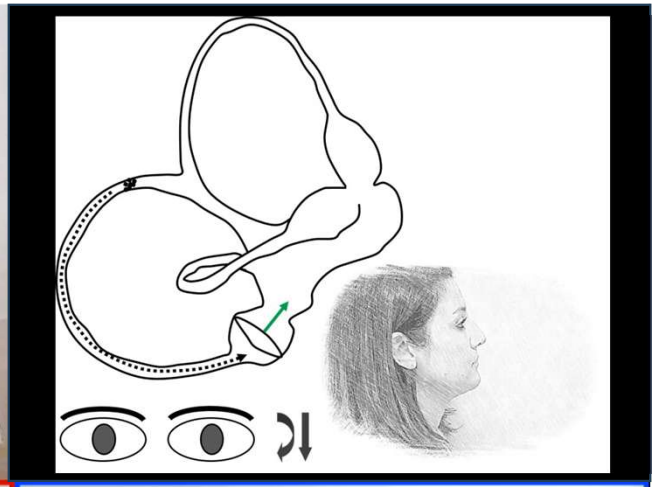


# Apogeotropic PC BPPV

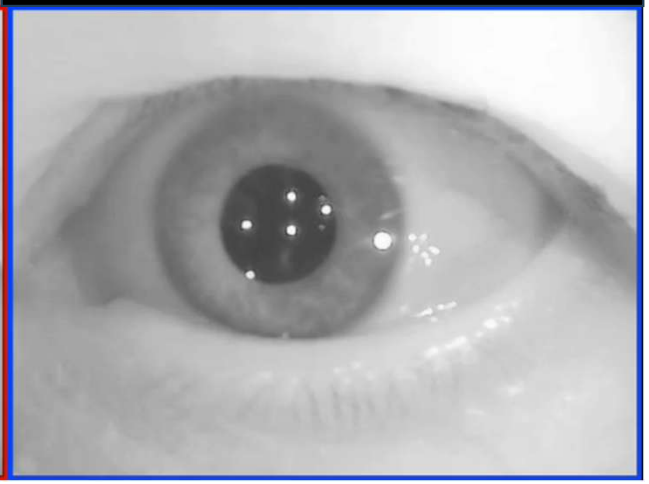


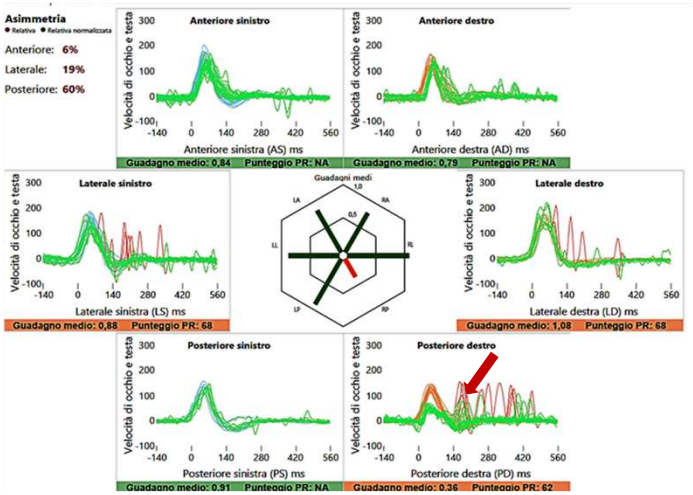
# PC canalith jam







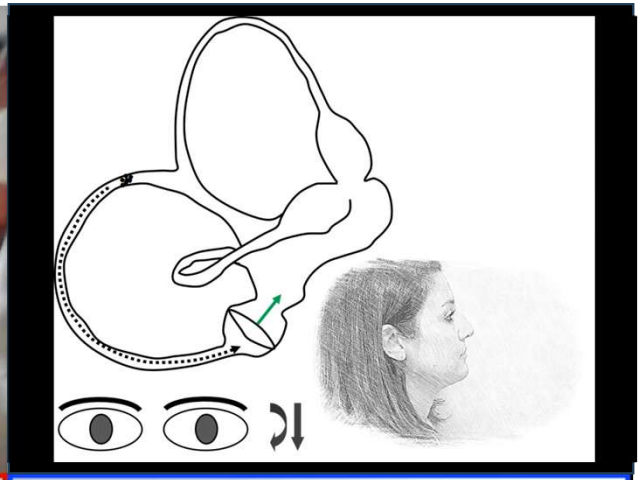


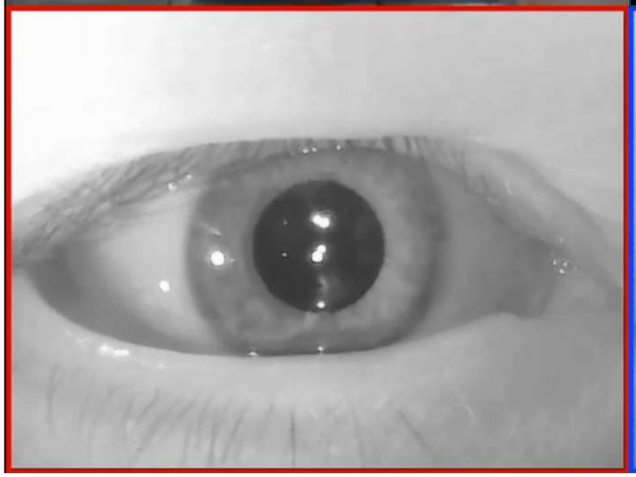


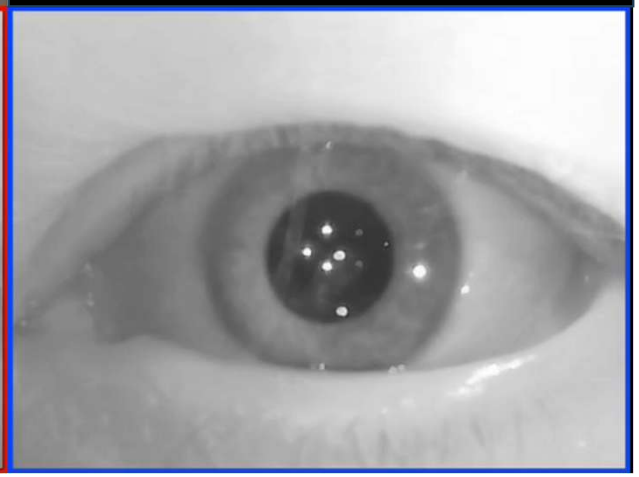
# PC canalith jam

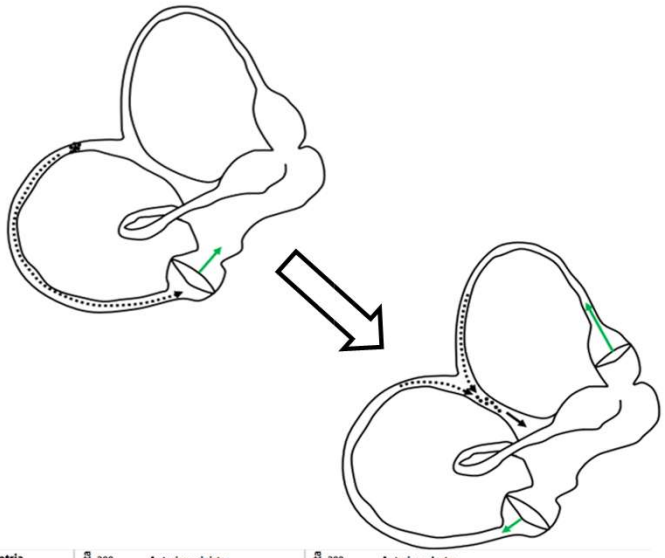
## 1 week later

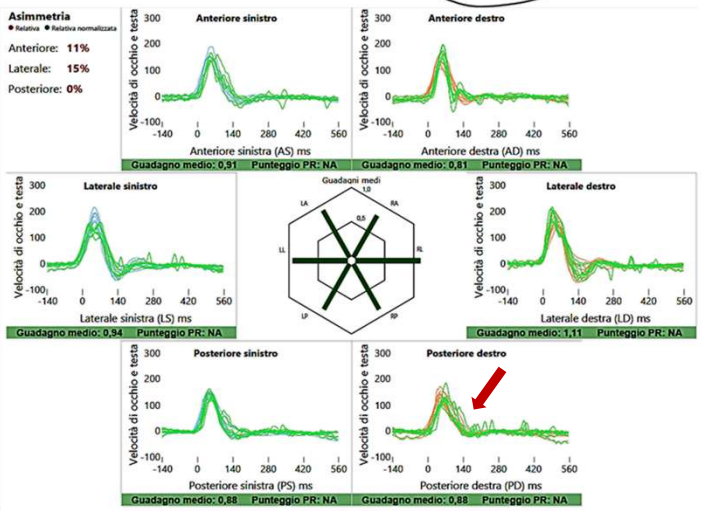




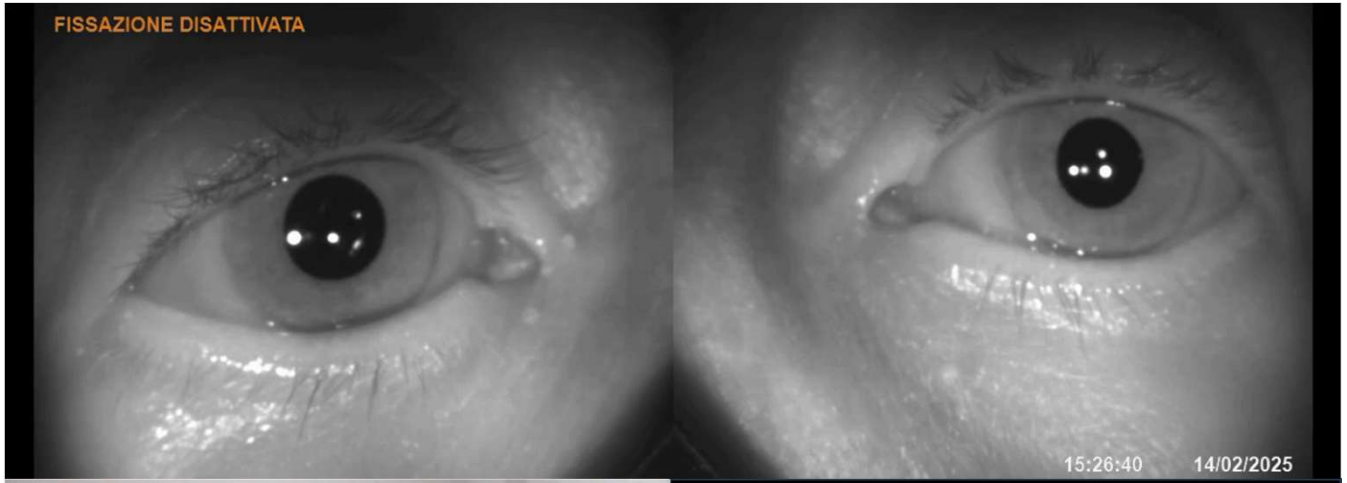




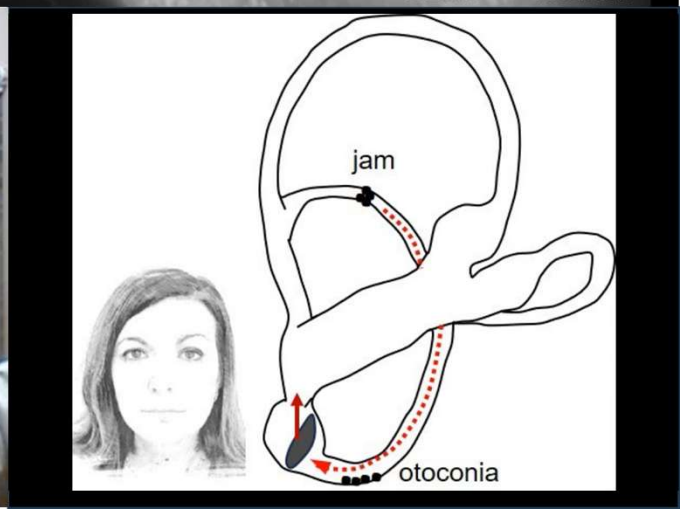


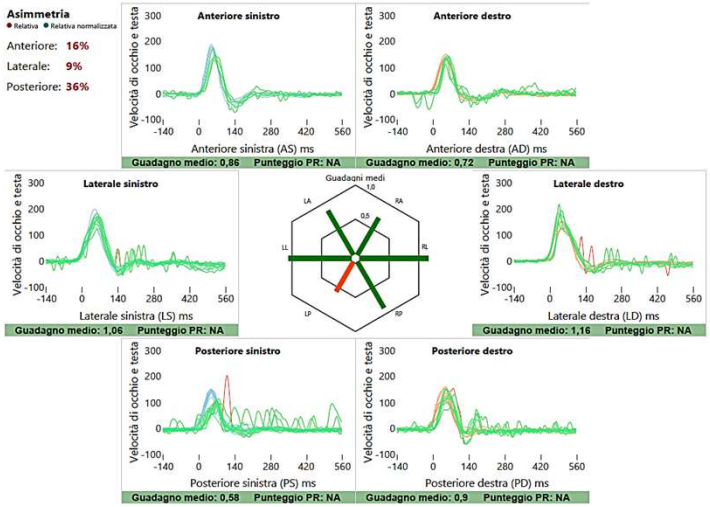


# PC canalith jam





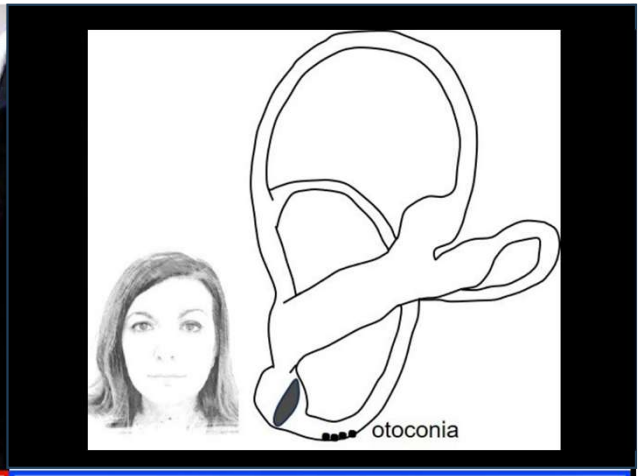



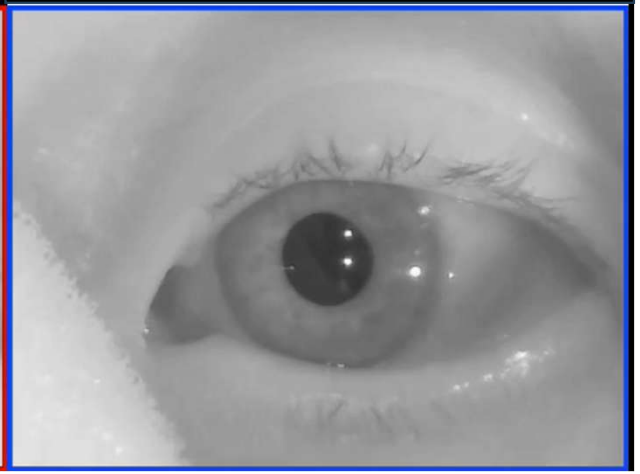
# PC canalith jam

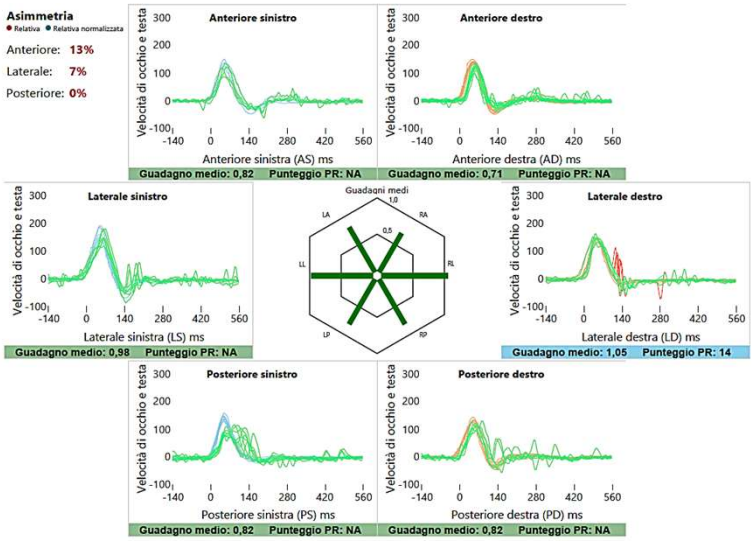
## 3 weeks later







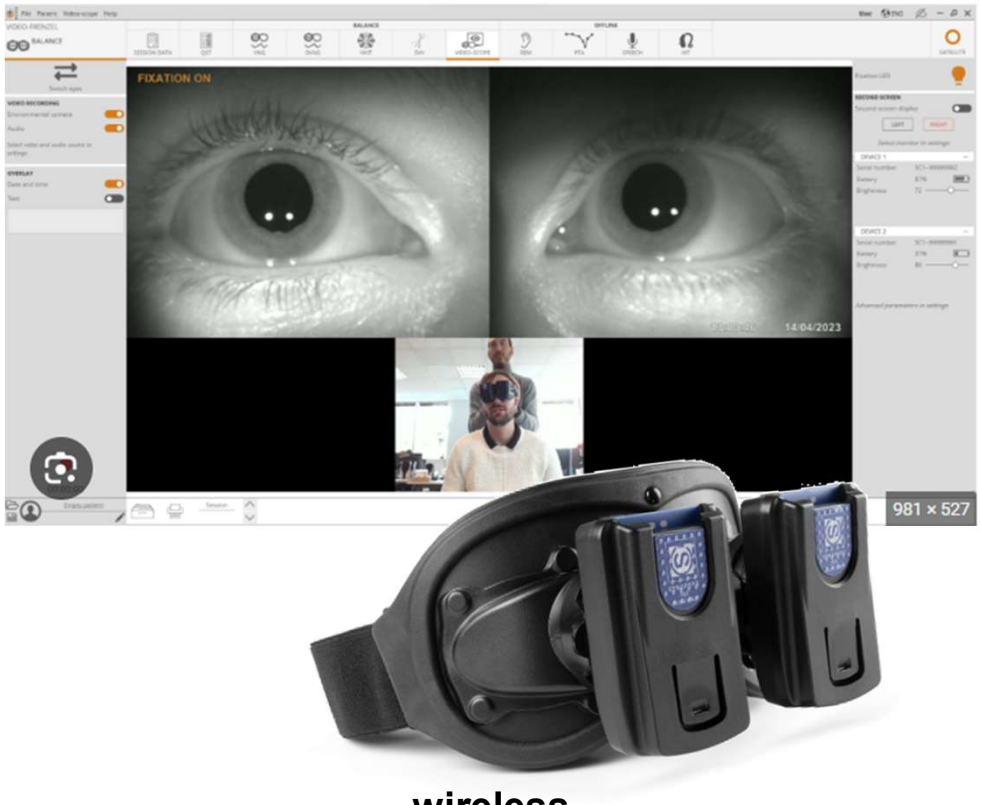





# Video-Frenzel




cable

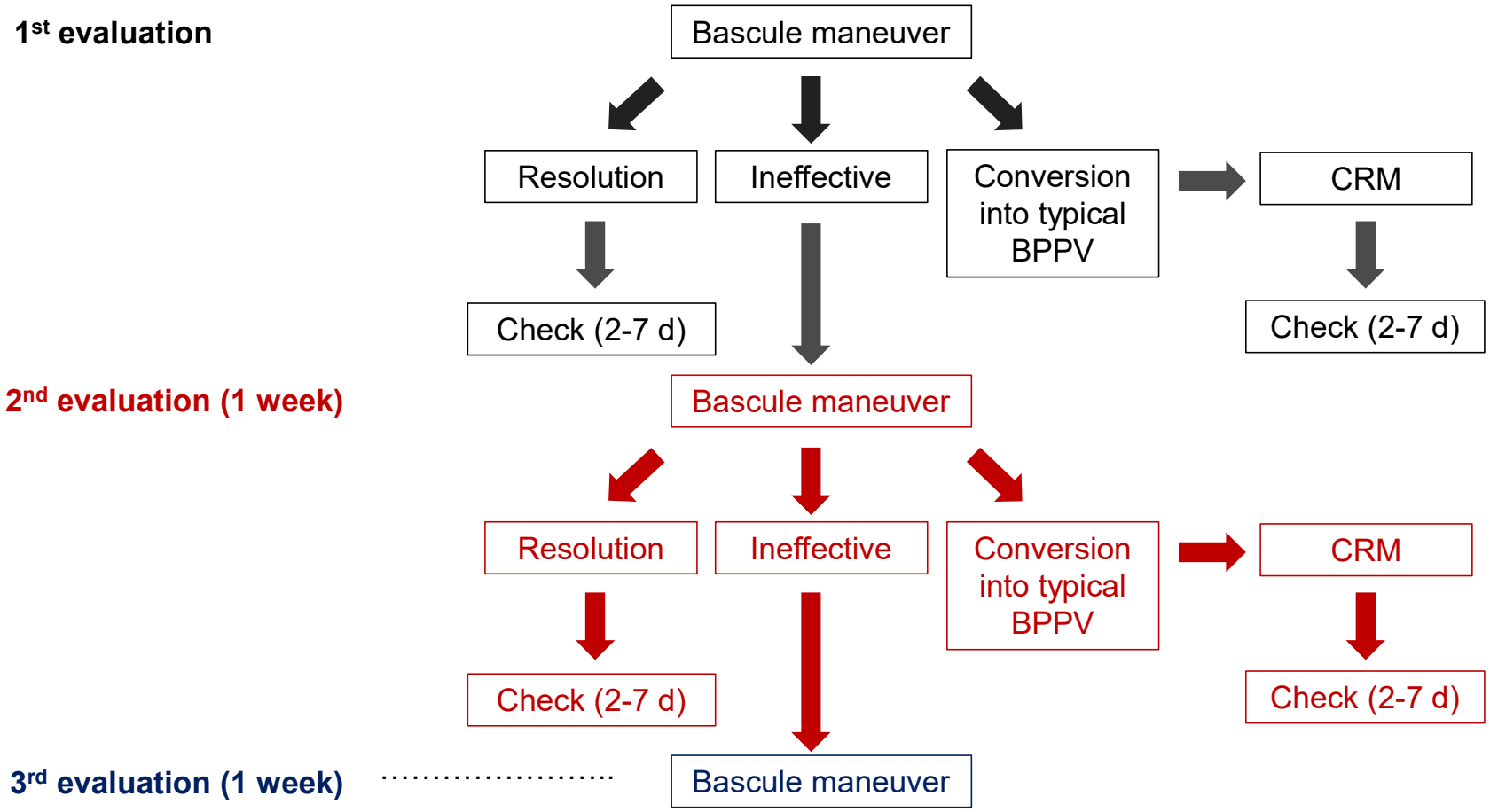



wireless

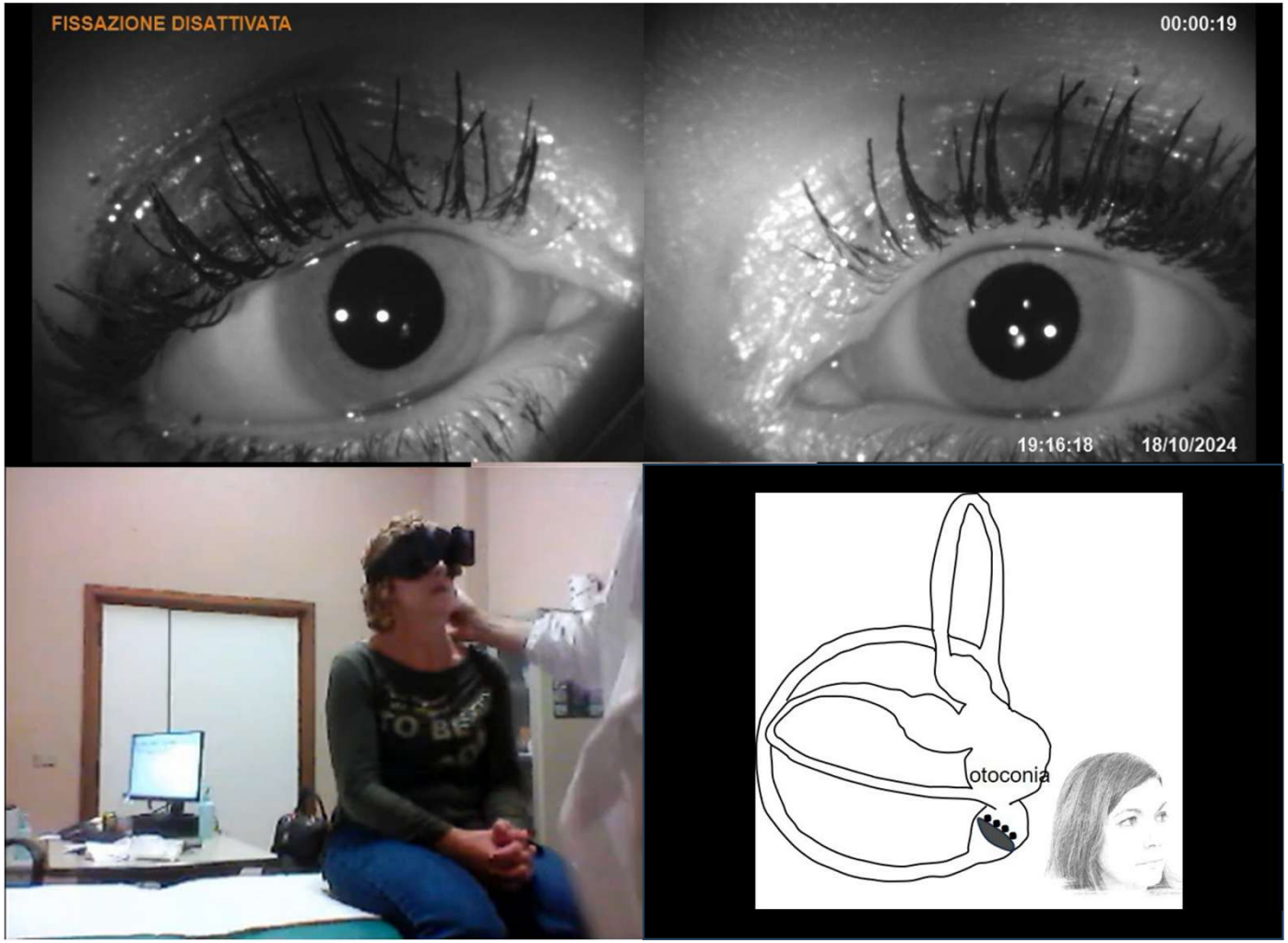
# Results

- **127 patients with atypical PC-BPPV or AC-BPPV** refractory to standard CRM were prospectively **treated with the bascule maneuver**
  - M: F = 33 : 94
  - mean age: 61.9 ± 12.4 years
  - 75 cases: bascule along the **LARP plane**
  - 52 cases: bascule along the **RALP plane**
- 42 subjects: **PC cupulolithiasis**
- 38 subjects: **positional downbeat nystagmus**
  - apogeotropic PC BPPV
  - AC BPPV
- 35 subjects: **sitting-up vertigo**
- 9 subjects: **refractory typical PC BPPV**
- 3 subjects: **PC / AC canalith jam**

# Results

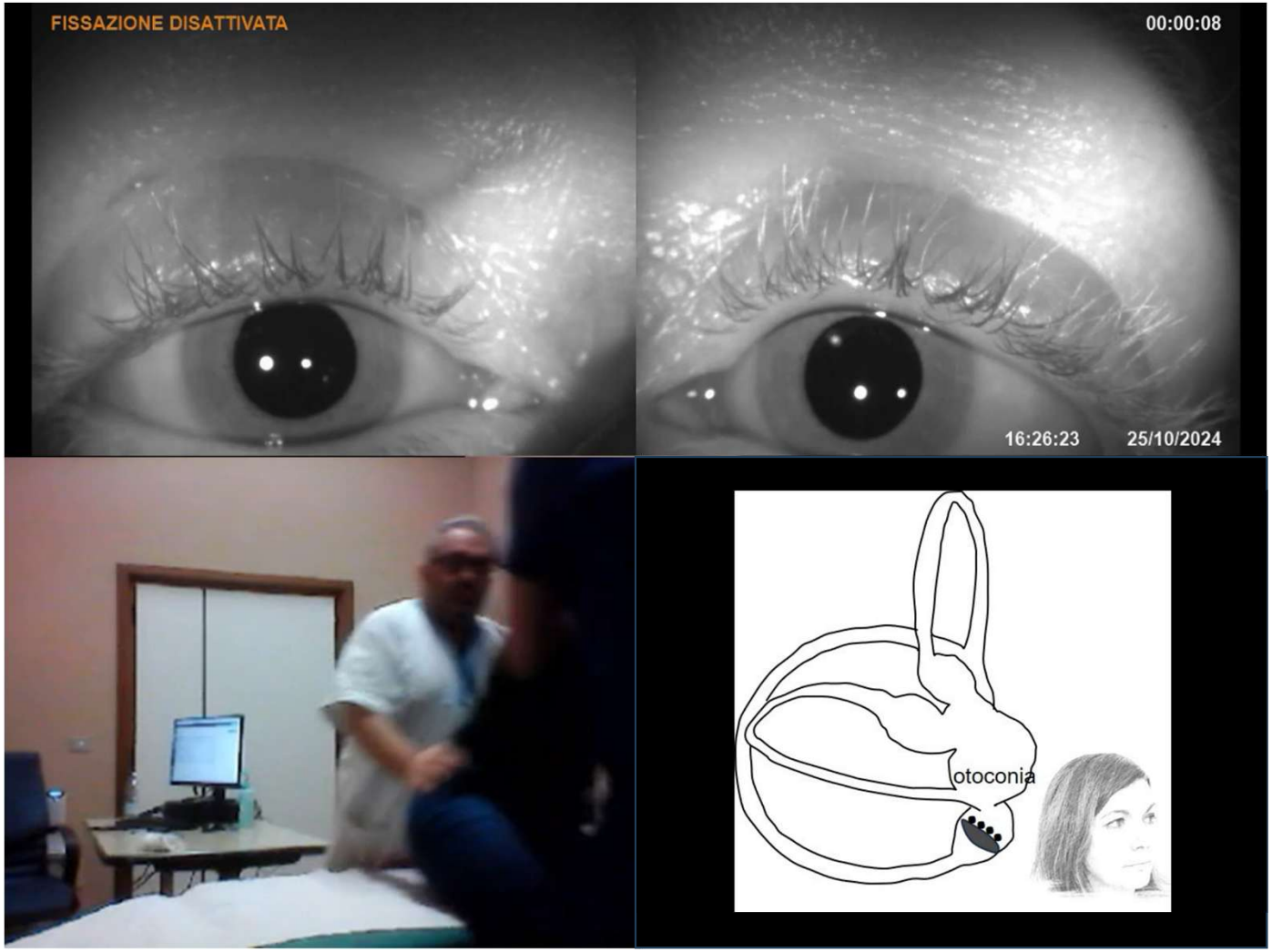

1st evaluation
Bascule maneuver
Resolution
Ineffective
Conversion into typical BPPV
CRM
Check (2-7 d)
Check (2-7 d)
2nd evaluation (1 week)
Bascule maneuver
Resolution
Ineffective
Conversion into typical BPPV
CRM
Check (2-7 d)
Check (2-7 d)
3rd evaluation (1 week)
Bascule maneuver

# Importance of the following check (within 1 week)



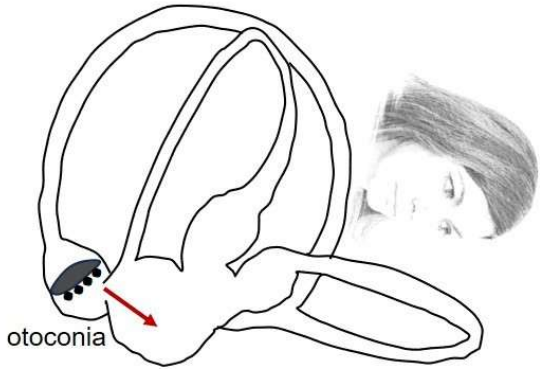
# Importance of the following check (within 1 week)

**After 1 week**

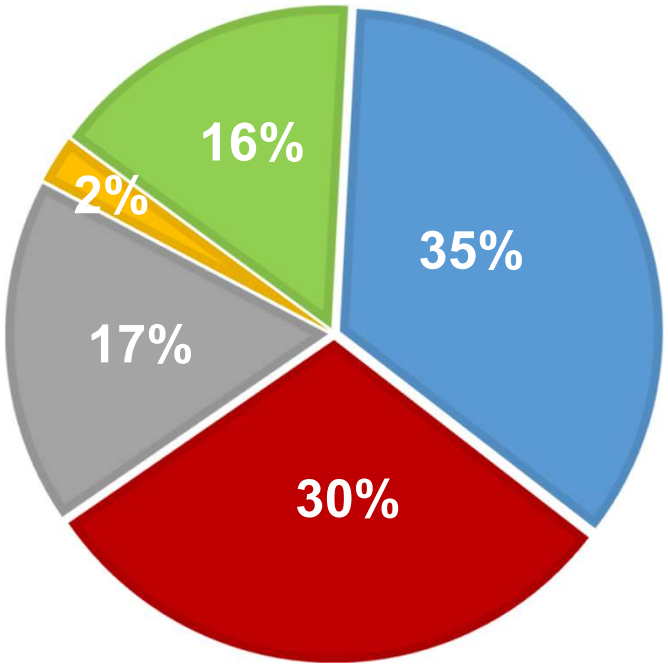


# Possible explanation for a false positive outcome

## Possible migration of debris toward the lower part of the cupula



# Results




- resolution (44)
- conversion in PC BPPV (38)
- conversion in LC BPPV (22)
- conversion in AC BPPV (3)
- ineffective (20)

**Effective in 107 cases (84.3%)**

- **Detection of the original position of otoliths** in most variants
- **Positional downbeat nystagmus**
  - **Non ampullary arm of the PC** in 35 cases
  - AC in 3 cases
- **PC cupulolithiasis** and **sitting up vertigo**
  - **utricular side** in 44 cases
  - canal side in 27 cases

# PC cupulolithiasis

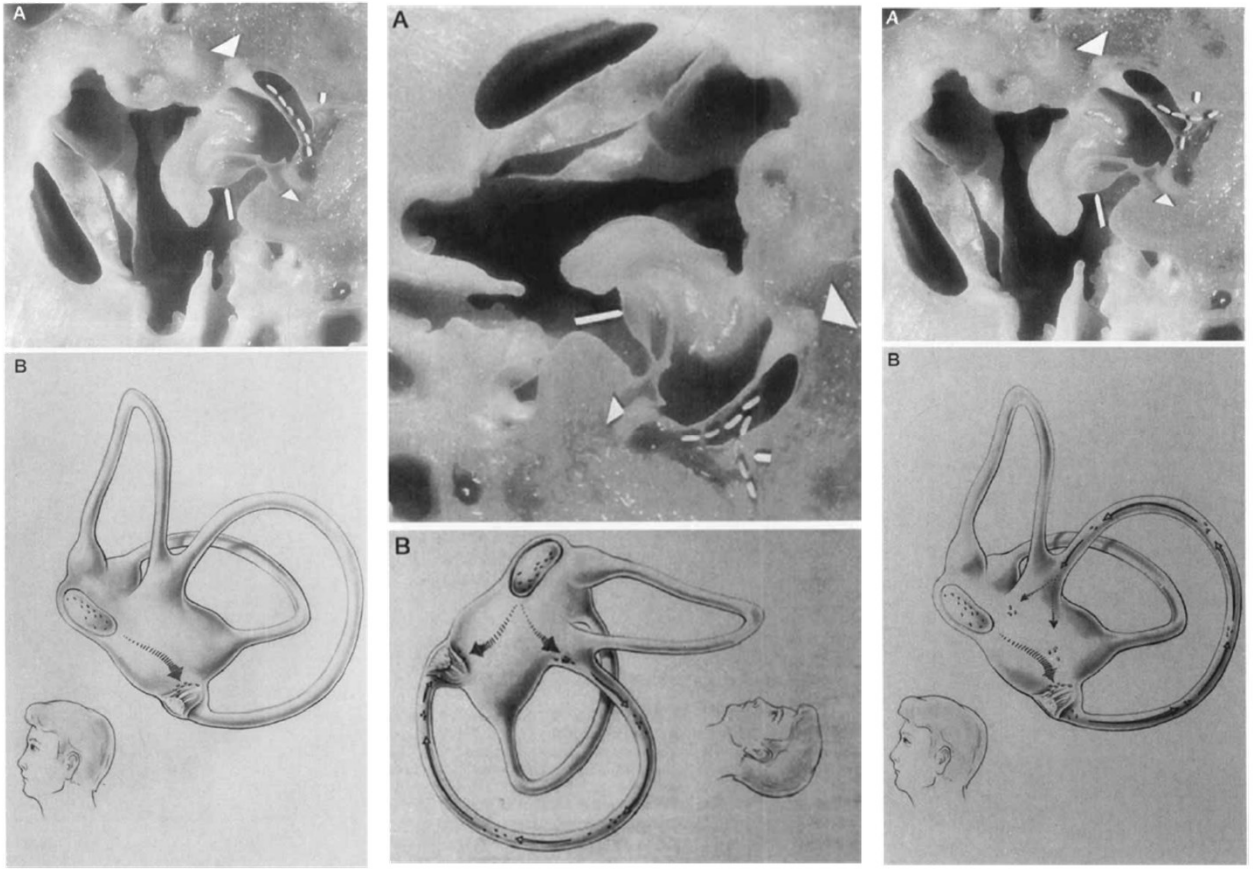
## Otoliths adhering to the utricular side of the PC cupula

*The Laryngoscope*
Lippincott Williams & Wilkins, Inc., Philadelphia
© 1999 The American Laryngological, Rhinological and Otological Society, Inc.

Anatomical and Theoretical Observations on Otolith Repositioning for Benign Paroxysmal Positional Vertigo

Richard A. Buckingham, MD

- According to temporal bone studies, **the utricular side of the PC cupula** represents one of the most likely position for dislodged otoconia to settle
  - Upright position
  - Supine position
  - After CRM



# PC cupulolithiasis

## Otoliths adhering to the utricular side of the PC cupula

OPEN

**Numerical Simulations of the Epley Maneuver With Clinical Implications**

Ismael Arán-Tapia,[1,2,3] Andrés Soto-Varela,[4,5,6] Vicente Pérez-Muñuzuri,[1,3] Sofía Santos-Pérez,[4,5,6] Ismael Arán,[7] and Alberto P. Muñuzuri[1,2]

Check for updates

OPEN ACCESS

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The University of Sydney, Australia

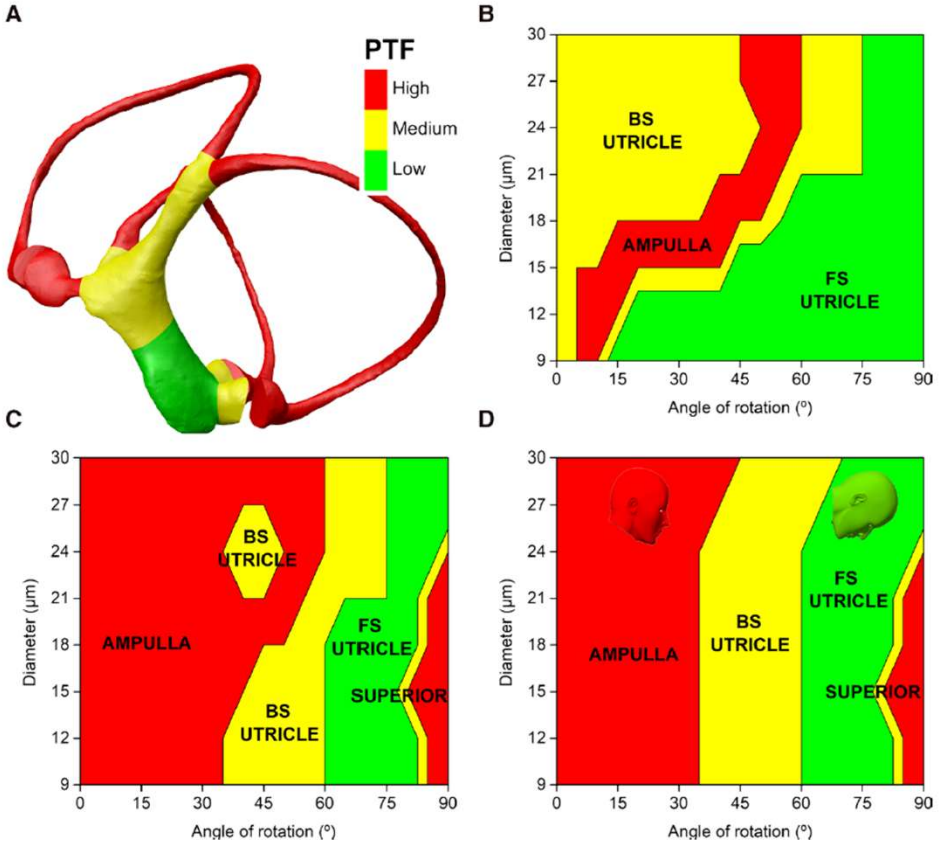
*CORRESPONDENCE
Marcos Rossi-Izquierdo
marcos_rossi@hotmail.com

RECEIVED 15 January 2025
ACCEPTED 24 February 2025
PUBLISHED 11 March 2025

CITATION
Rossi-Izquierdo M, Santos-Pérez S,

**Personalized medicine to treat refractory benign paroxysmal positional vertigo, through computational fluid dynamics analysis from magnetic resonance image reconstructions**

Marcos Rossi-Izquierdo[1*], Sofía Santos-Pérez[2,3,4], Ismael Arán-Tapia[5,6], Miguel Blanco-Ulla[7], Ismael Arán-González[8], Isabel Vaamonde-Sánchez-Andrade[2], Virginia Franco-Gutiérrez[1], Vicente Pérez-Muñuzuri[5,6], Alberto P. Muñuzuri[5,9] and Andrés Soto-Varela[2,3,4]




- According to mathematical models, variation of the angle of the head during Epley CRM might facilitate otoconia settling **the utricular side of the PC cupula (ampulla)**

# PC short arm lithiasis

## Benign Paroxysmal Positional Vertigo

### A Clinician's Perspective

JOHN G. OAS

*Program of Vestibular & Balance Disorders, Cleveland Clinic Foundation/A71, Cleveland, Ohio 44195, USA*

Published in final edited form as:
*J Neurol Neurosurg Psychiatry*. 2011 January ; 82(1): 98–104. doi:10.1136/jnnp.2009.199208.

**Sitting-up vertigo and trunk retropulsion in patients with benign positional vertigo but without positional nystagmus**

**Béla Büki**[1], **László Simon**[2], **Sándor Garab**[2], **Yunxia W. Lundberg**[3], **Heinz Jünger**[1], and **Dominik Straumann**[4]

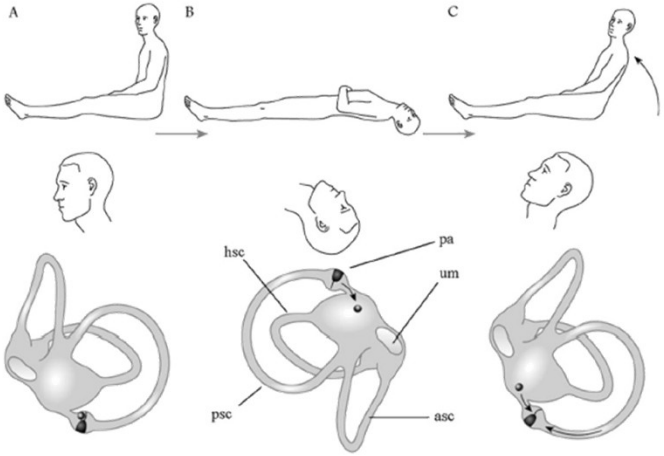
## Typical and atypical benign paroxysmal positional vertigo: Literature review and new theoretical considerations

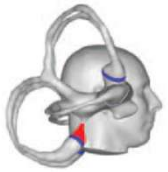
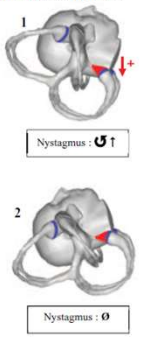
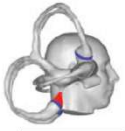
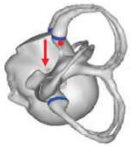
Béla Büki[a], Marco Mandalà[b,*] and Daniele Nuti[b]
[a]*Department of Otolaryngology, Karl Landsteiner University Hospital Krems, Krems an der Donau, Austria*
[b]*Otology and Skull Base Surgery Department, Azienda Ospedaliera Universitaria Senese, Siena, Italy*

## Unusual Locations of Benign Paroxysmal Positional Vertigo: Rare Entity or Regular Occurrence?

*Léa Fath, *†Hella Vuong-Chaney, *Dominique Rohmer, ‡Michael Lamy, §Daniel Baumgartner, ||François Simon, *Christian Debry, and *§Anne Charpiot

**Department of Otorhinolaryngology (ENT) and Head and Neck Surgery, Strasbourg University Hospital, CHRU Hautepierre; †Department of Otorhinolaryngology (ENT) and Head and Neck Surgery, Pasteur Hospital, Colmar; ‡Strasbourg University, Strasbourg; §Laboratoire ICube, UMR 7357, Illkirch; and ||Department of Otorhinolaryngology (ENT) and Head and Neck Surgery, Necker Hospital, Assistance Publique – Hôpitaux de Paris, Paris, France*




| *Location* | *Diagnosis* | *Therapeutic maneuver* |
|---|---|---|
|  | Right Dix and Hallpike<br><br>1<br>Nystagmus : ↺ ↑<br>2<br>Nystagmus : 0<br>Back to the sitting position<br><br>Nystagmus : ↺ ↑ |  |
| Right posterior canal short arm canalolithiasis | Right Dix and Hallpike :<br>1. Counterclockwise and up beating nystagmus, not reversing when the patient returned to seated position<br>2. No nystagmus if the short arm was horizontal due to the head in hyperextension, but apparition of a counterclockwise and up beating nystagmus when the patient returned to seated position | A prolonged forward head leaning |

# PC short arm lithiasis

## Bow and Yaw maneuver PC short-arm BPPV)

Brazilian Journal of Otorhinolaryngology 2022;88(5):733–739

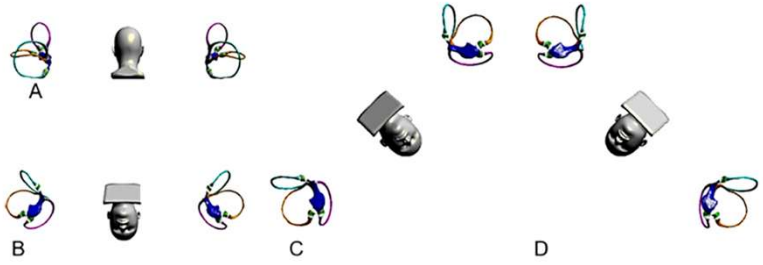
Brazilian Journal of
OTORHINOLARYNGOLOGY
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ORIGINAL ARTICLE

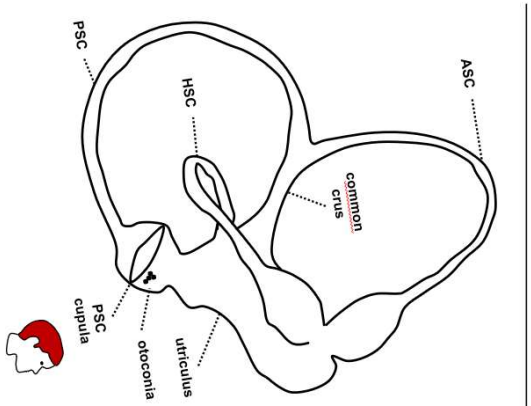
**Diagnosis and treatment of the short-arm type posterior semicircular canal BPPV**☆

Diagnóstico e tratamento da VPPB de braço curto do canal semicircular posterior

Lin Ping [a], Zhou Yi-fei [b], Wu Shu-zhi [a], Zheng Yan-yan [a], Yang Xiao-kai [a,*]





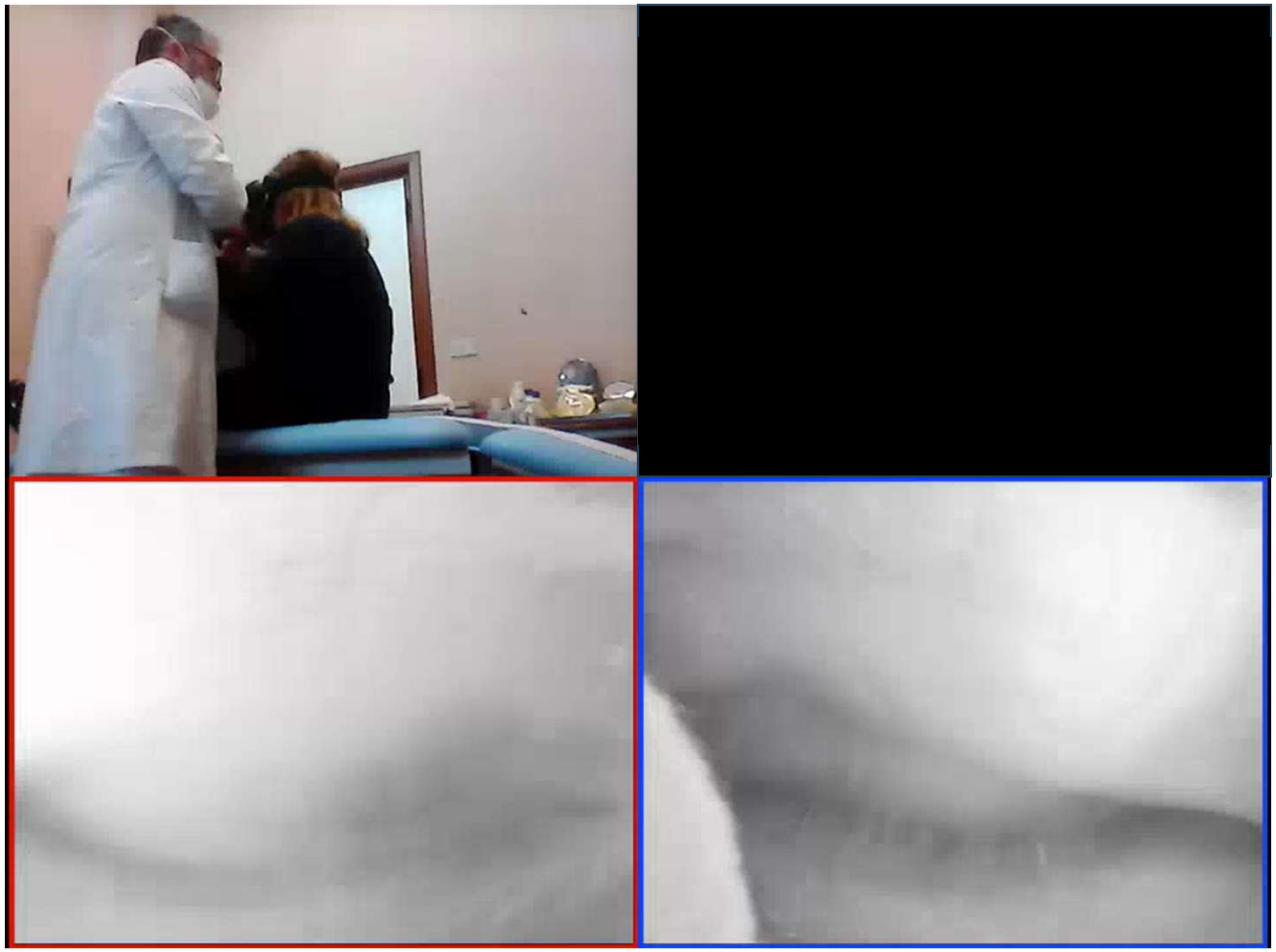





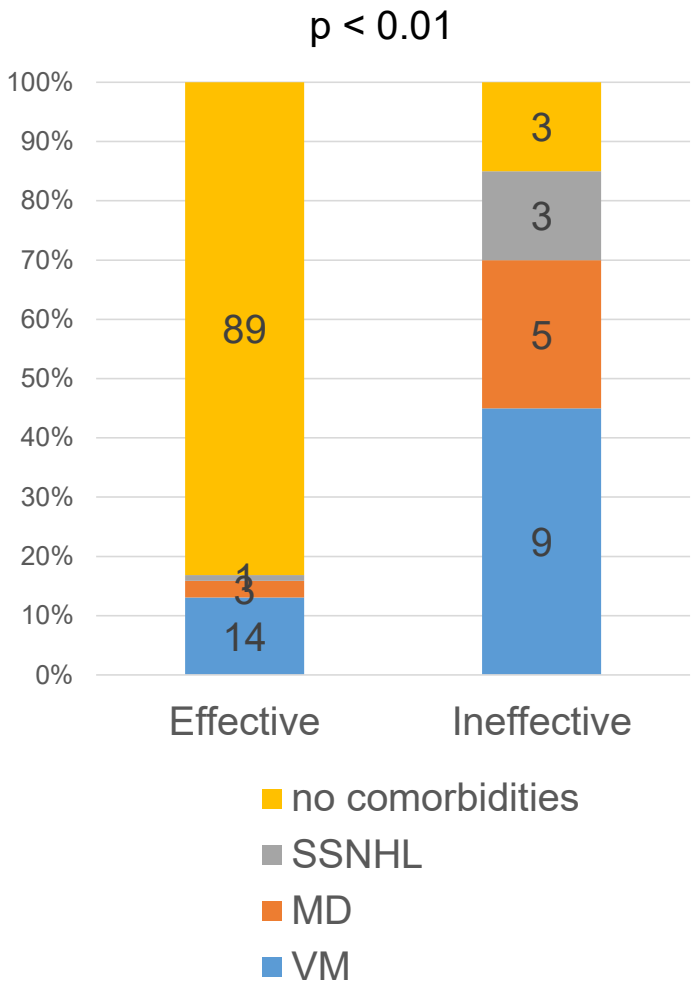



# PC short arm lithiasis

## Residual dizziness – subjective BPPV – Type 2 BPPV



# Results




See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/267637857

Gravity Sensitive Cupula of Posterior Semicircular Canal. In online supplementary information (pp188–199) of the Basic and Clinical Ocular Motor and Vestibular Research: A Tribute...

Article in Annals of the New York Academy of Sciences · September 2011

ACTA OTO-LARYNGOLOGICA, 2017
http://dx.doi.org/10.1080/00016489.2017.1318220

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RESEARCH ARTICLE

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## Clinical criteria of positional vertical nystagmus in vestibular migraine

Mohamed Mohamed El-Badry[a], Hesham Samy[a], Abdel Mageed Kabel[b], Fatma Mohamed Rafat[a] and Hossam Sanyelbhaa[b]

[a]Faculty of Medicine, Audio-Vestibular Unit, Minia University, Almenia, Egypt; [b]Faculty of Medicine, Department of Otolaryngology, Menoufia University, Shebien Elkoom, Egypt

ARTICLE

## Capturing acute vertigo

A vestibular event monitor

Allison S. Young, MAud, Corinna Lechner, MPhil, Andrew P. Bradshaw, PhD, Hamish G. MacDougall, PhD, Deborah A. Black, PhD, G. Michael Halmagyi, MD, and Miriam S. Welgampola, PhD

*Neurology*® 2019;92:e2743-e2753. doi:10.1212/WNL.0000000000007644

# Bascule maneuver

Letter to the Editor

## Novel Case of Bilateral Posterior Canal Benign Paroxysmal Positional Vertigo (BPPV) with Double Canal Switch and Canal Jam Following Treatment with Epley Maneuver

Letter to the Editor

## Direction-Reversing Positional Nystagmus in Typical Posterior Semicircular Canalolithiasis with Ipsicanal Transformation via Non-ampullary Arm Canalolithiasis to Posterior Cupulolithiasis

Original Article

## Physical therapy for posterior semicircular cupulolithiasis: A case series of 15 patients from South Rajasthan

Andrea Castellucci, Alfarghal Mohamad[1], Ajay Kumar Vats[2], Sudhir Kothari[3], Shreya Vats[4], Avinash Bijlani[5]

Department of Surgery, Azienda USL-IRCCS di Reggio Emilia, Reggio Emilia, Italy, [1]Department of ENT, King Abdul Aziz Medical City, Jeddah, Saudi Arabia, [2]Department of Medicine and Neurology, Shantiraj Hospital, Udaipur, Rajasthan, India, [3]Department of Neurology, Poona Hospital and Research Centre, Pune, Maharashtra, India, [4]Otoneurology Centre, Udaipur, Rajasthan, India, [5]Madhaw Clinic - ENT and Vertigo, New Delhi, India

PHYSIOTHERAPY THEORY AND PRACTICE
https://doi.org/10.1080/09593985.2025.2558800

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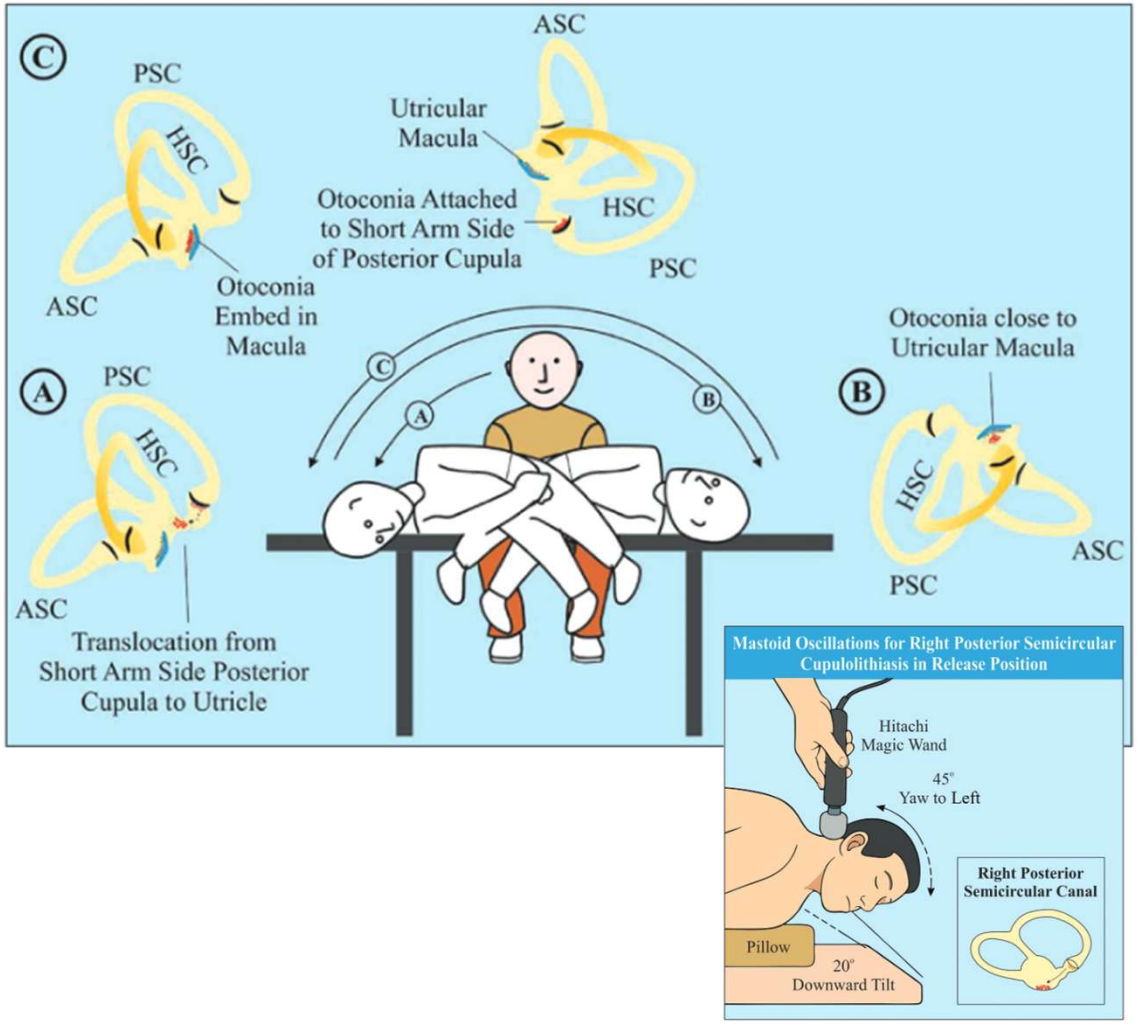
CASE REPORT

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## Management of tri-canal benign paroxysmal positional vertigo using sequential repositioning maneuvers: a case report

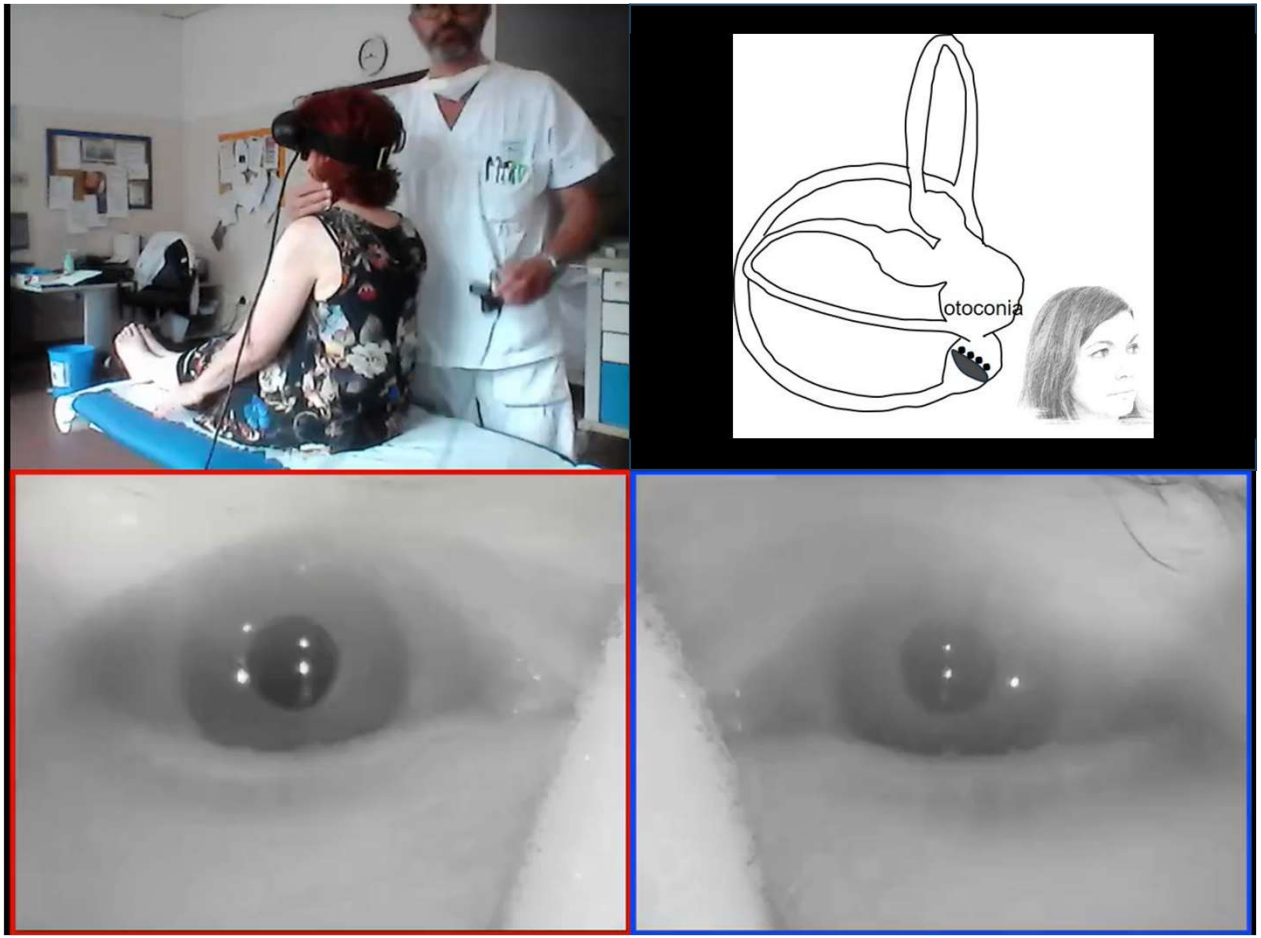
Ajay Kumar Vats[a], Andrea Castellucci[b], Alfarghal Mohamad[c], Sudhir Kothari[d], and Shreya Vats[e]

[a]Department of Medicine and Neurology, Shantiraj Hospital, Udaipur, India; [b]Department of Surgery, Azienda USL—IRCCS, Reggio Emilia, Italy; [c]ENT Department, Hearing & Balance Clinic at King Abdul Aziz Medical City-Jeddah, KSA, Jeddah, Saudi Arabi; [d]Department of Neurology, Poona Hospital and Research Centre, Pune, India; [e]Clinical Vestibulology Observer, Otoneurology Centre, Udaipur, India



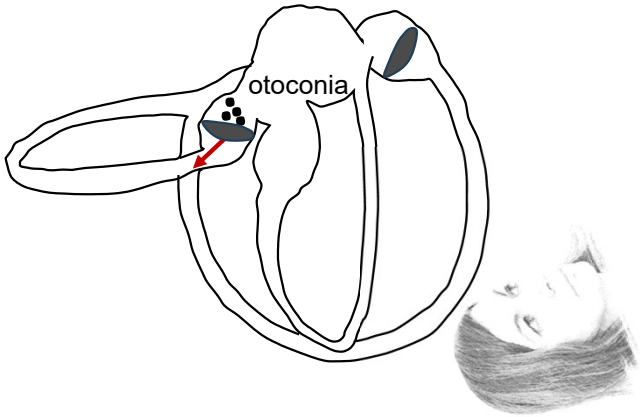
# PC cupulolithiasis

## “Liberatory sign”



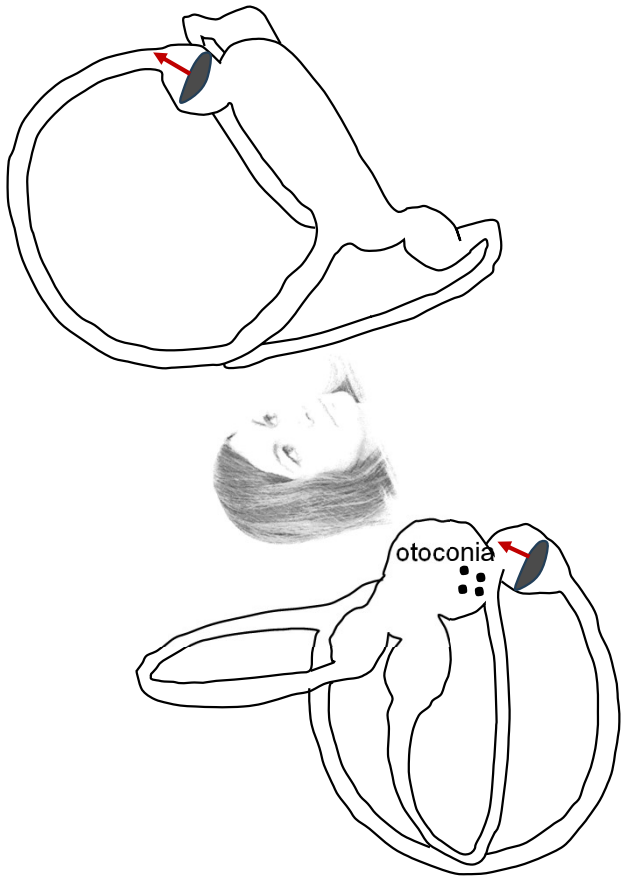
# Good prognostic sign → “Liberatory nystagmus”

## Possible AC stimulation

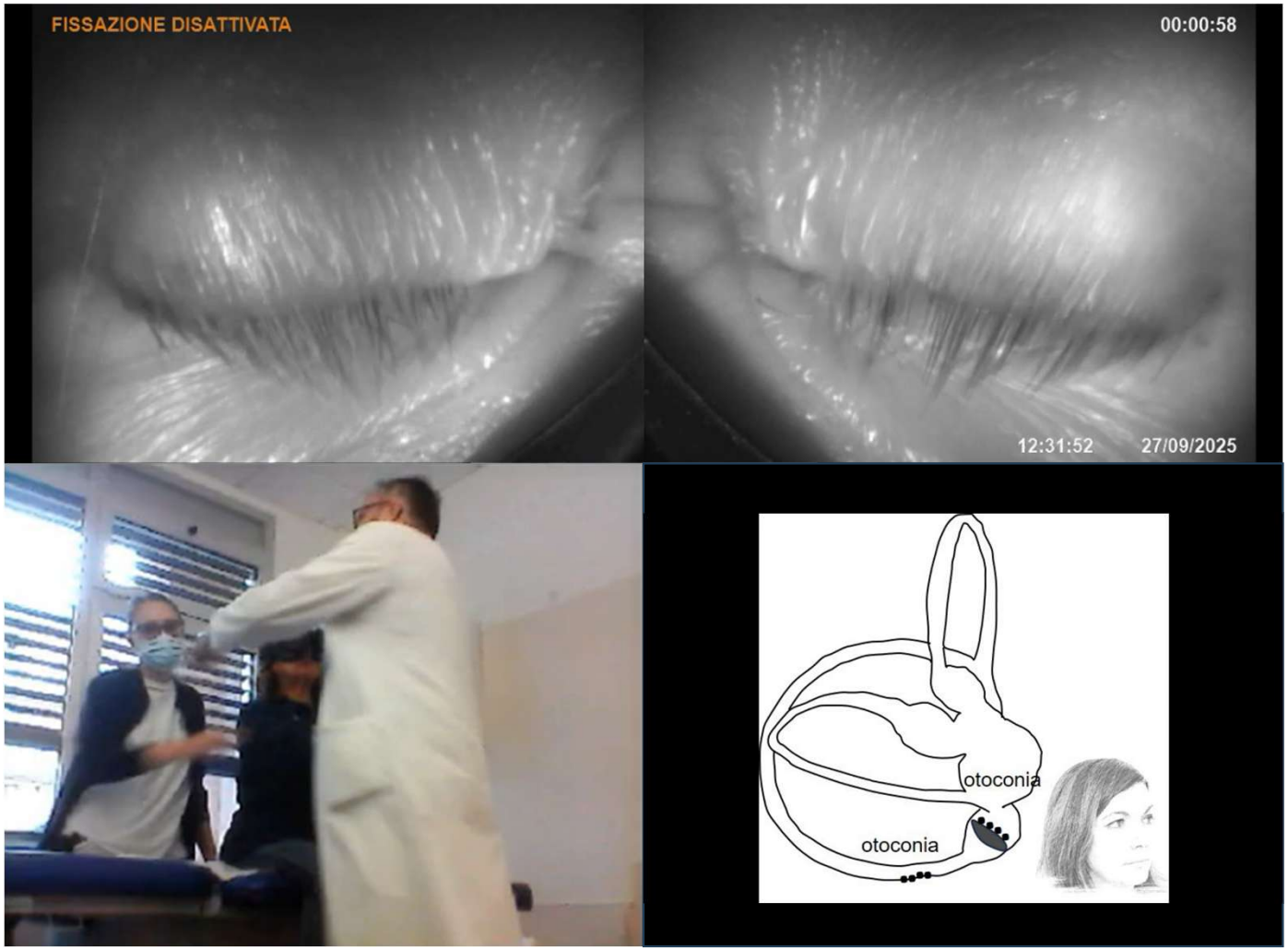


## Good prognostic sign → “Liberatory nystagmus”

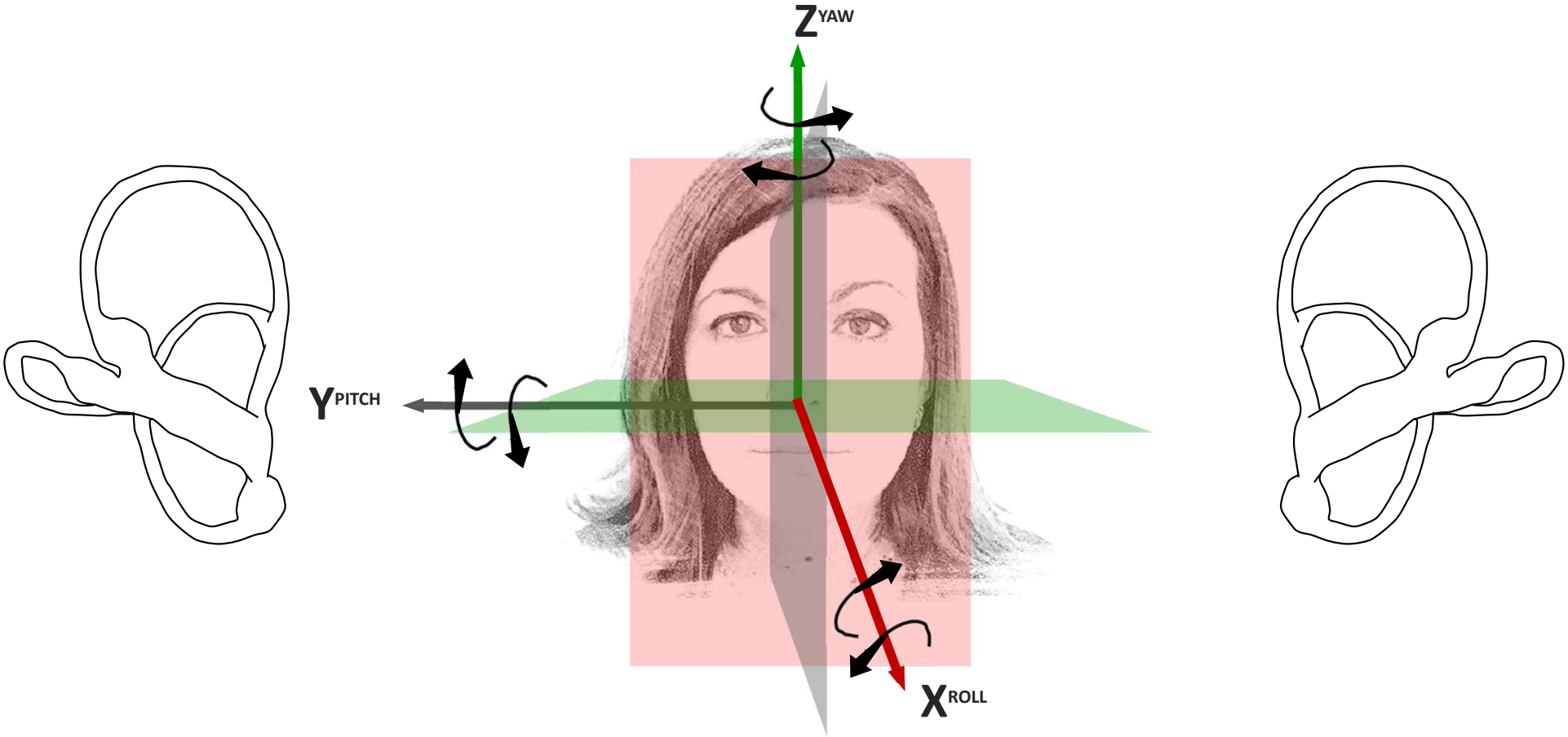
**Possible “reset” of the afferents resting firing rate**



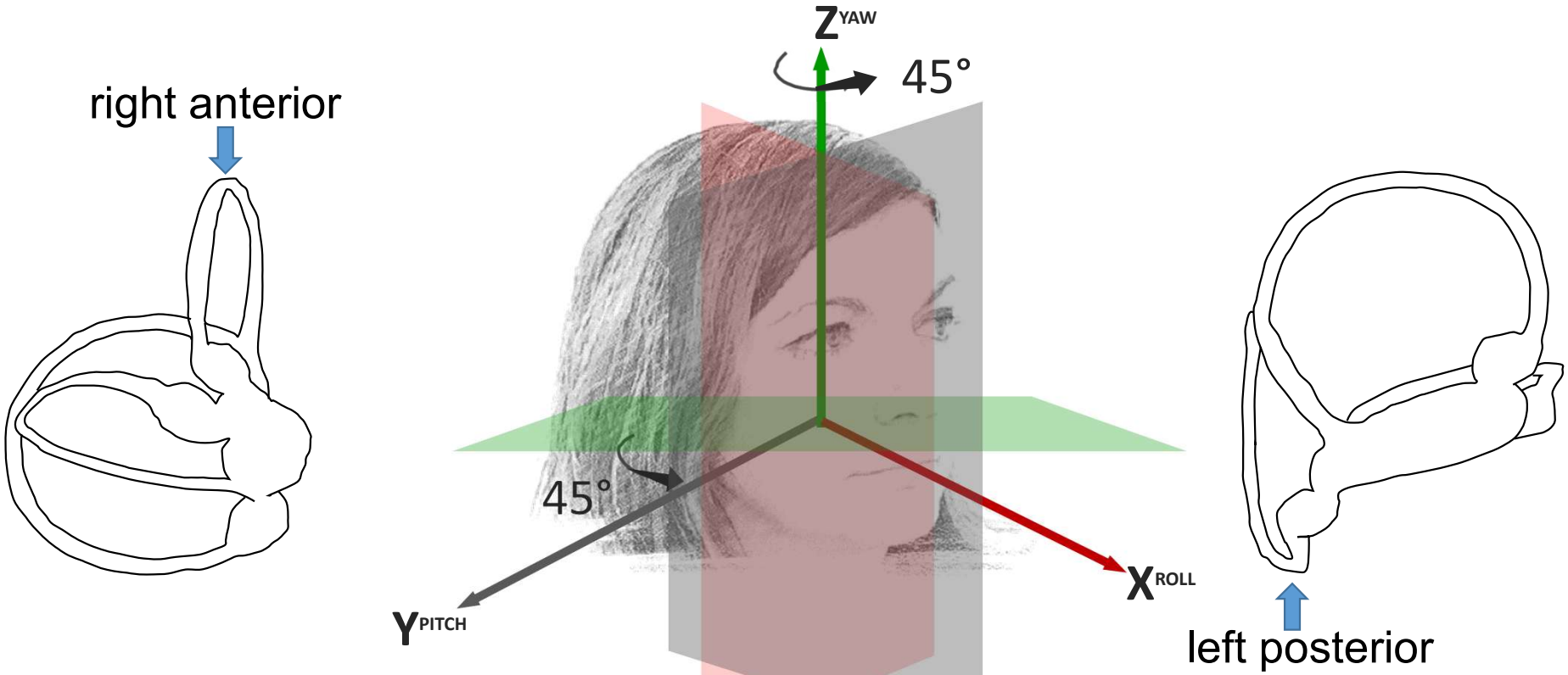
# PC cupulo - canalolithiasis



# Spatial planes and axes

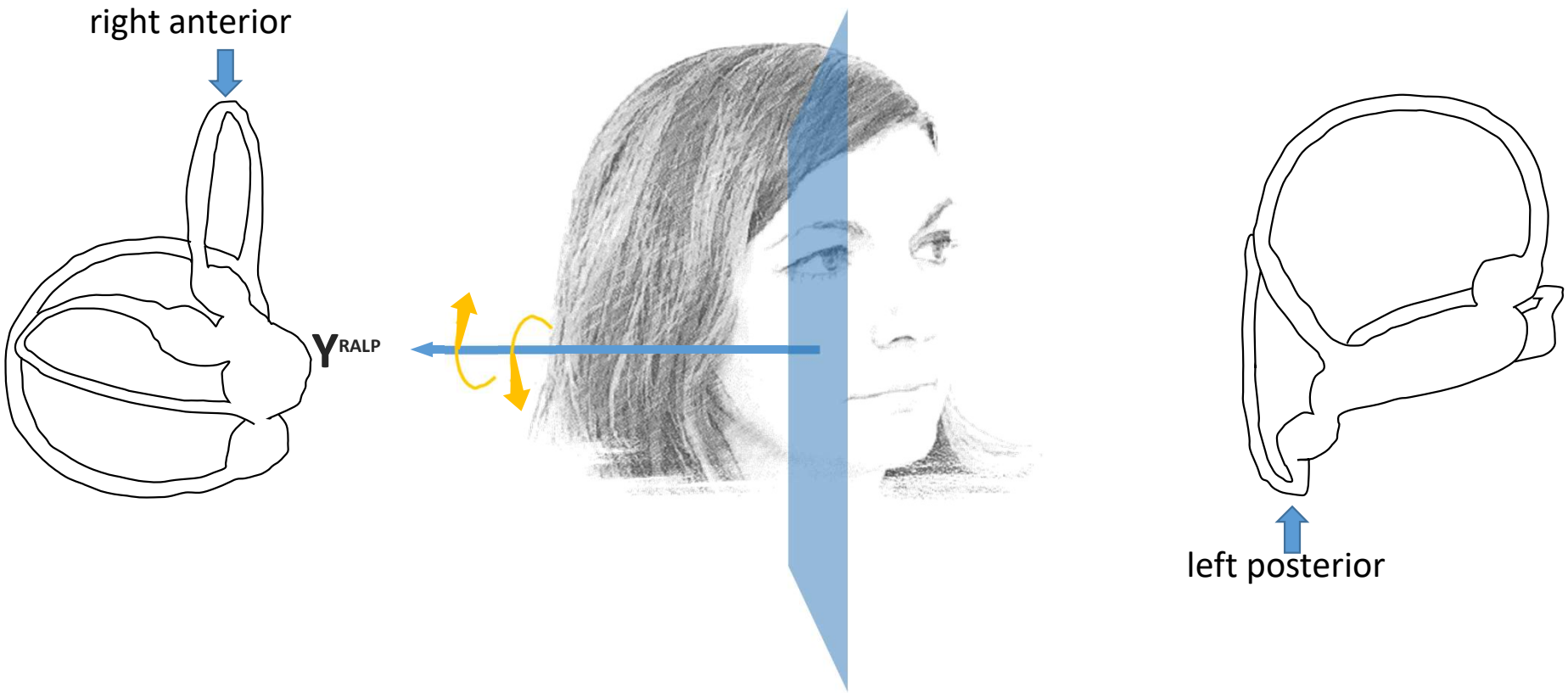


# Spatial planes and axes



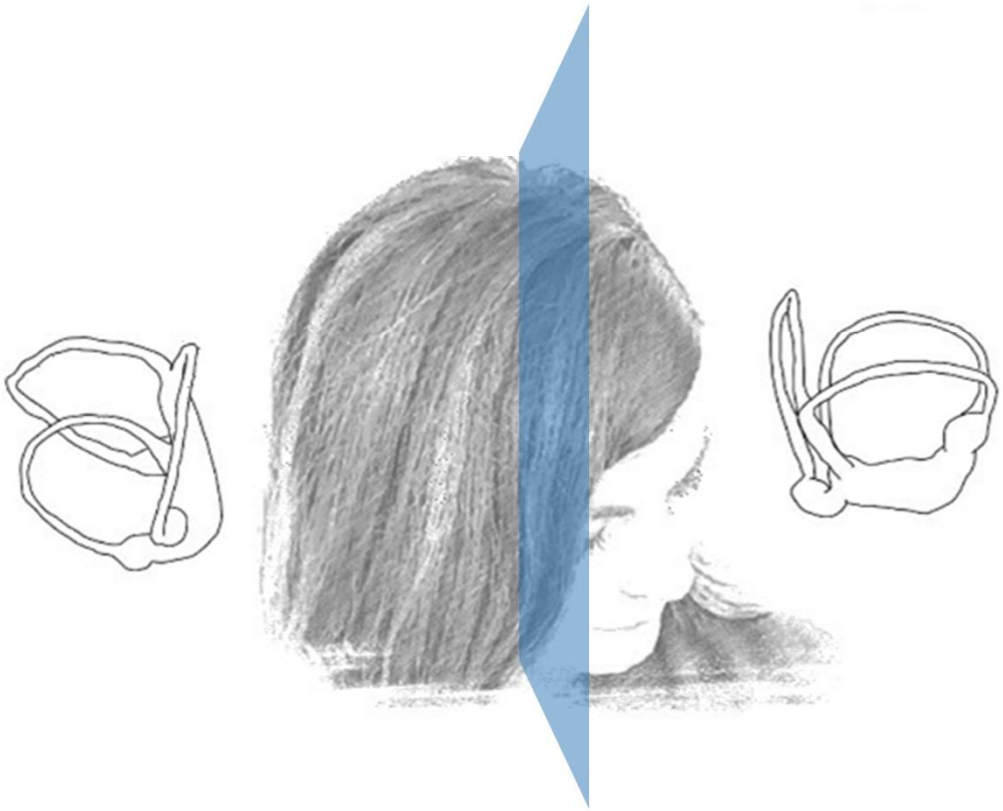
# Spatial planes and axes

## RALP PLANE (around the $Y^{RALP}$ AXIS)

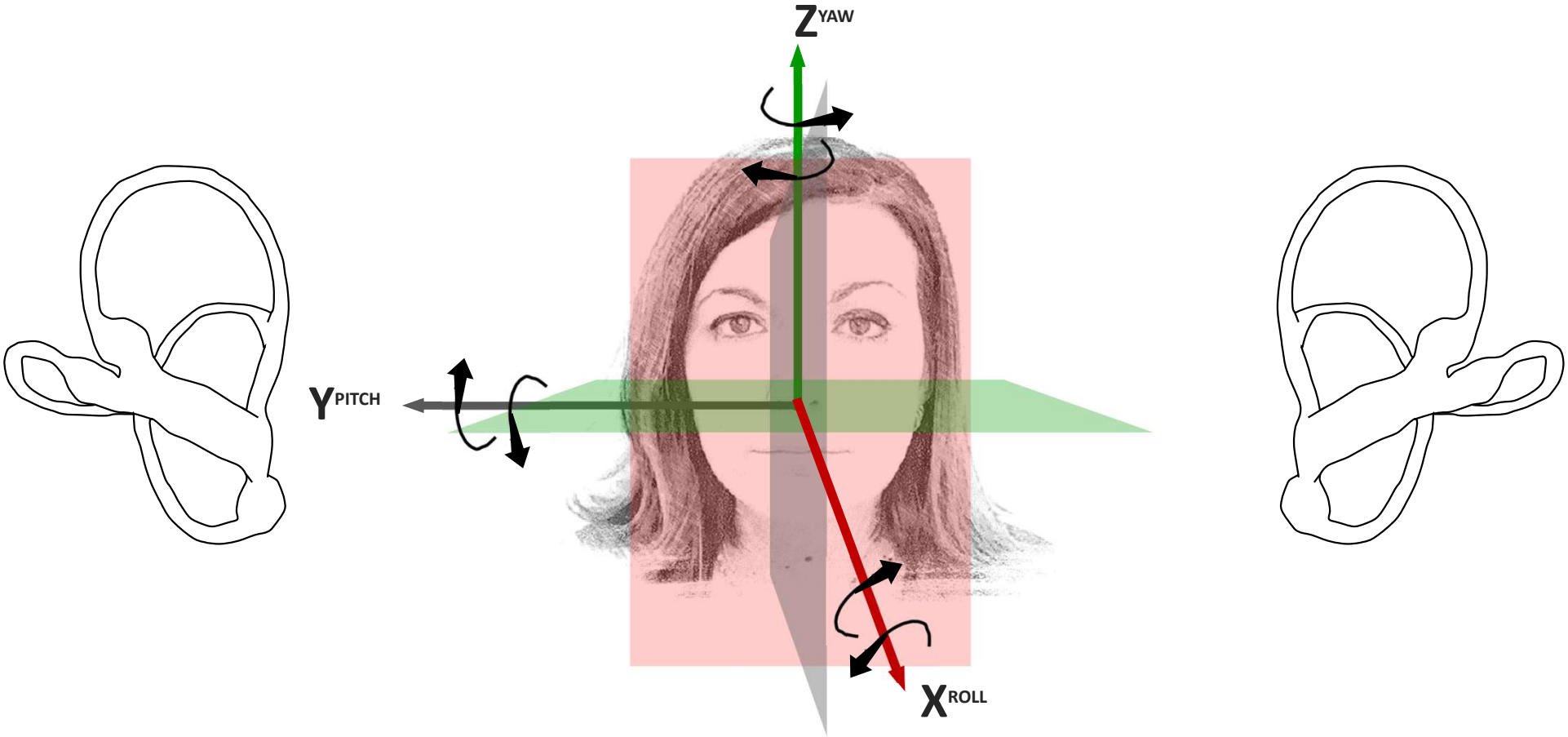


# Spatial planes and axes

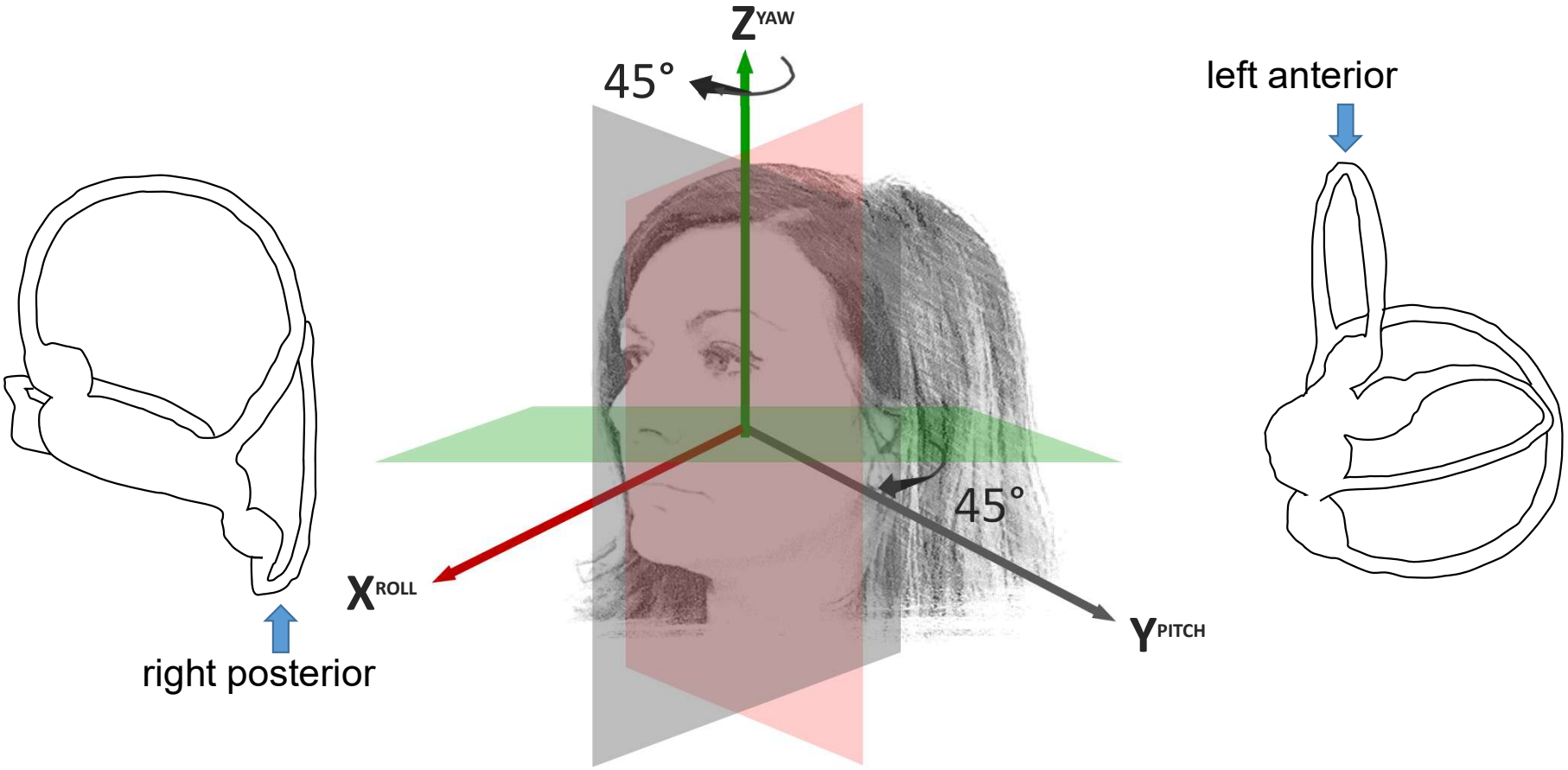
## RALP PLANE (around the $Y^{RALP}$ AXIS)



# Spatial planes and axes

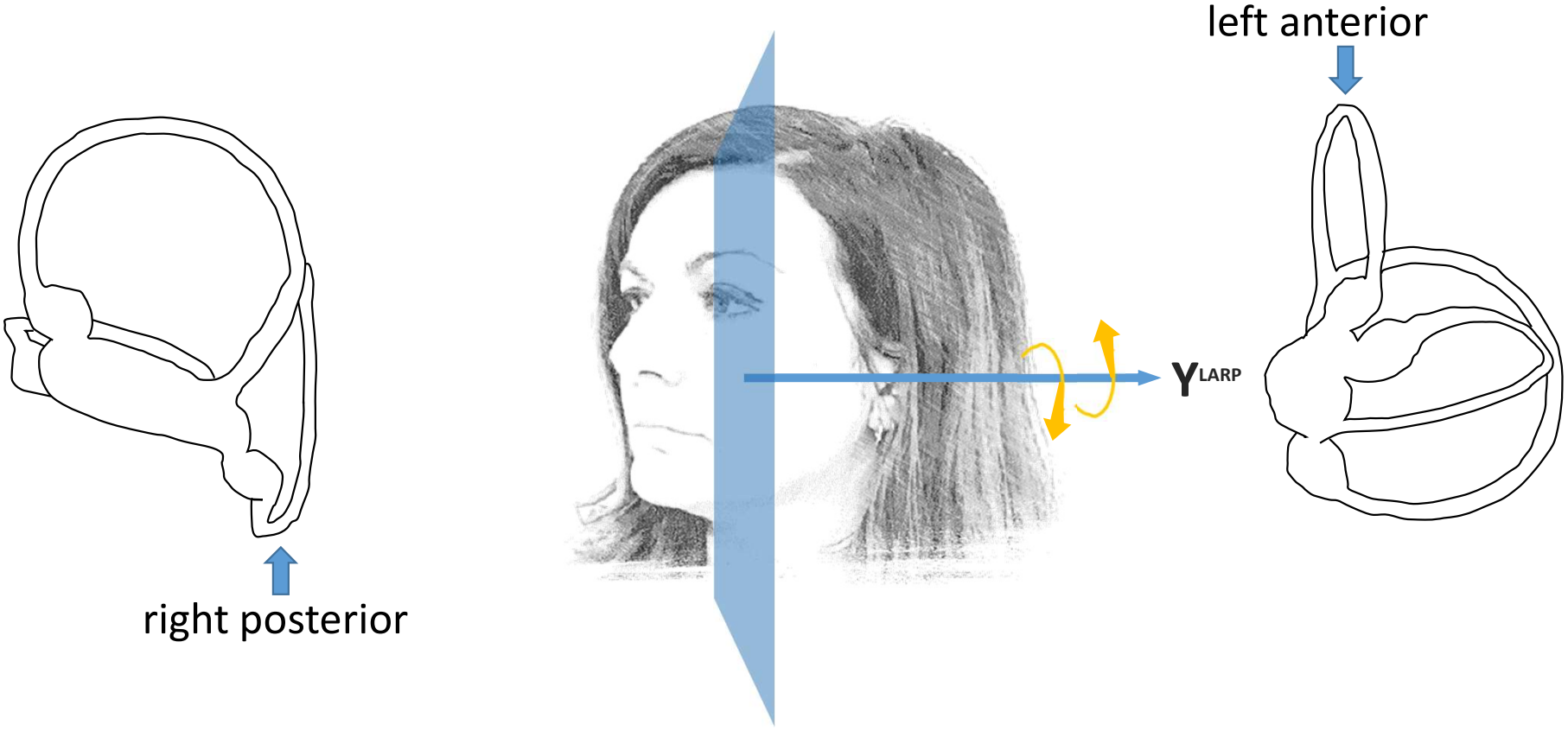


# Spatial planes and axes



# Spatial planes and axes

## LARP PLANE (around the $Y^{LARP}$ AXIS)



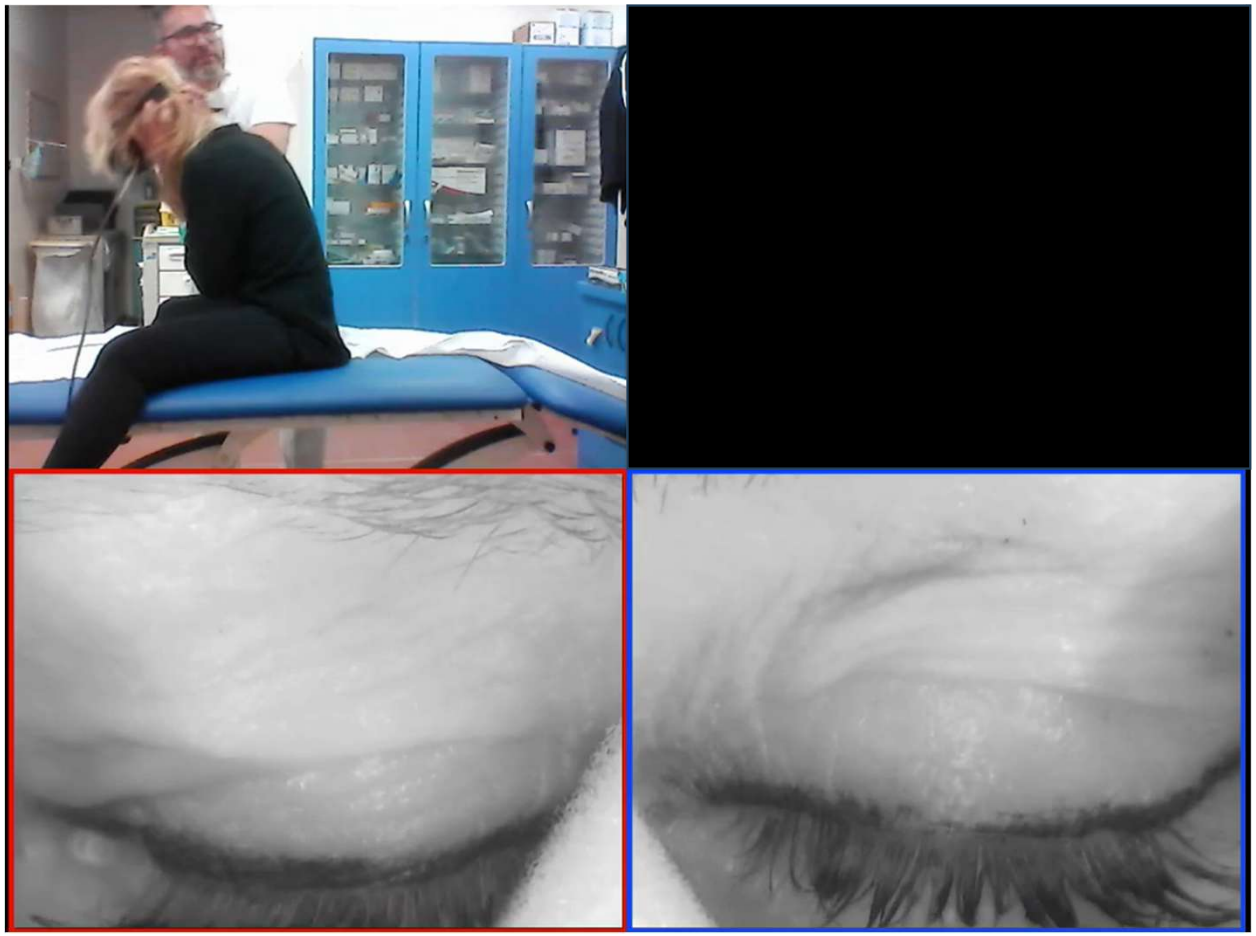
# Spatial planes and axes

## LARP PLANE (around the $Y^{LARP}$ AXIS)



# Alternative Bascule maneuver

## LARP PLANE (around the $Y^{LARP}$ AXIS)

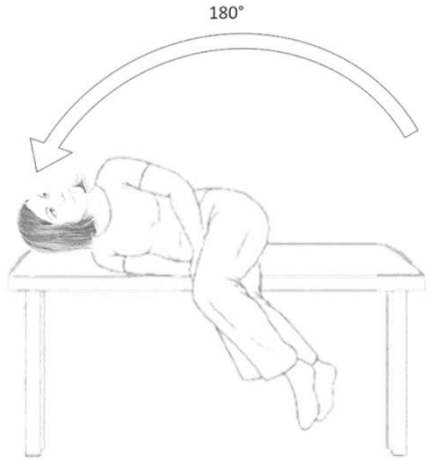


# Conclusions

- From our preliminary data, the **bascule maneuver** seems to represent a promising maneuver for the **management for atypical PC-BPPV** refractory to standard CRM
  - **direct resolution** of 1/3 of the cases
  - **conversion** of almost half of the cases in **typical BPPV variants** which are easily treated

- It also has a **diagnostic role**
  - it allows the **detection of the original position of otoliths** in most PC cupulolithiasis and sitting up variants
  - it might addresses toward a **non–otolithic cause of positional vertigo** in most case of failure (VM, MD, etc…)

- **Further research are needed** to assess the feasibility of the bascule maneuver in atypical PC BPPV






# Thank You

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