

Les VERTIGES aux URGENCES

Ch. VAN NECHEL

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IRON, Paris



Airo



The Treatment and Natural Course of Peripheral and Central Vertigo

Deutsches Ärzteblatt International 2013; 110 : 505–16

Michael Strupp, Marianne Dieterich, Thomas Brandt

Frequency of various forms of vertigo among 17 718 patients at a specialized interdisciplinary center^{*1}

Form of vertigo	Frequency n	%
Benign paroxysmal positional vertigo	3036	17.1
Somatoform phobic vestibular vertigo	2661	15.0
Central vestibular syndromes	2178	12.3
Vestibular migraine	2017	11.4
Menière's disease	1795	10.1
Vestibular neuritis	1462	8.3
Bilateral vestibulopathy	1263	7.1
Vestibular paroxysmia	655	3.7
Psychogenic vertigo (other)	515	2.9
Perilymphatic fistula	93	0.5
Vertigo of unknown origin	480	2.7
Other ^{*2}	1563	8.8
Total	17 718	100.00

¹ 1988–2012: Vertigo clinic of Ludwig Maximilian University and the German Center for Vertigo and Balance Disorders

² Includes, among others, nonvestibular vertigo in neurodegenerative diseases, nonvestibular oculomotor disorders in myasthenia gravis, and peripheral ocular muscle paresis



VPPB DU CANAL POSTERIEUR DROIT



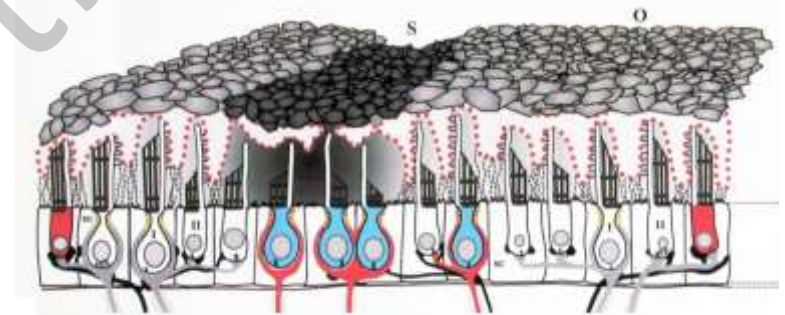
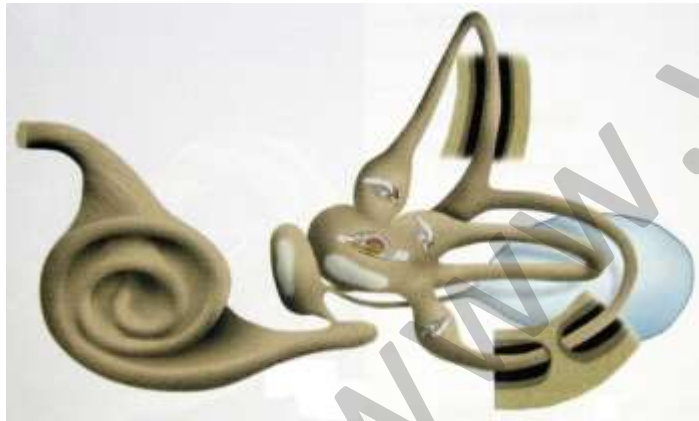
www.cliniquedesvertiges.be



Vertiges Positionel Paroxystique Bénin

N'est PAS un VPPB :

**Un vertiges de position
qui persiste > 2 min à l'immobilité.
qui n'est présent qu'au redressement**



The Costs and Utility of Imaging in Evaluating Dizzy Patients in the Emergency Room

Laryngoscope, 123:2250-2253, 2013

Syed F. Ahsan, MD, FACS; Mausumi N. Syamal, MD, MS; Kathleen Yaremchuk, MD, MSA;
Edward Peterson, PhD; Michael Seidman, MD, FACS

TABLE II.
Positive Yield for Imaging.

Imaging Modality	No. of Patients	Significantly Positive	% Yield
CT	810	6	0.74
MRI	90	11	12.2

CT = computed tomography; MRI = magnetic resonance imaging.

Retrospective study identified patients presenting to an integrated health care delivery system's ED with dizziness and vertigo [ICD-9] between January 2008 and January 2011.

Conclusions:

In the 3-year period studied, ... The use of MRI in all cases of dizziness was found to be **neither practical nor useful**.

However, appropriately directed MRI of the brain is **recommended in patients with dizziness and other neurological signs or symptoms**.



Cerebellar infarction presenting isolated vertigo

Frequency and vascular topographical patterns

H. Lee, MD; S.-I. Sohn, MD; Y.-W. Cho, MD; S.-R. Lee, MD; B.-H. Ahn, MD; B.-R. Park, MD; and R.W. Baloh, MD

NEUROLOGY 2006;67:1178–1183

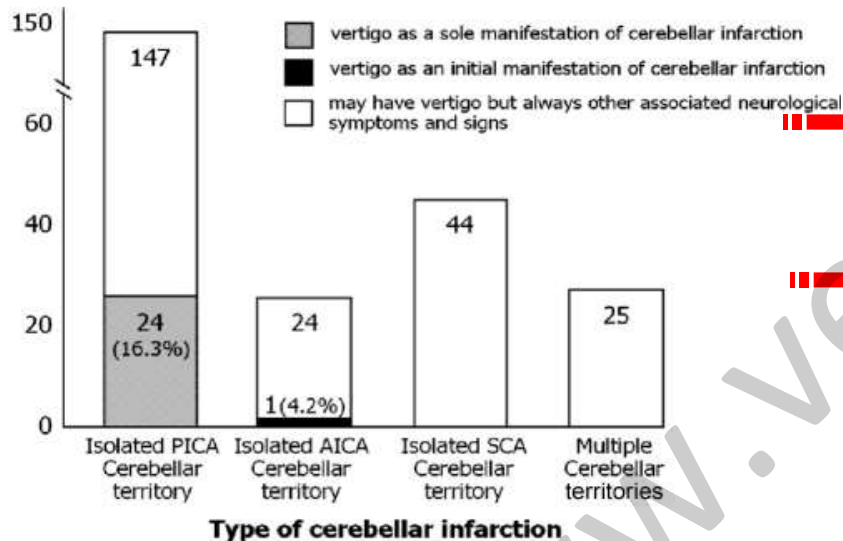


Table 2 Vestibular findings and imbalance in 24 patients with pseudo-vestibular neuritis associated with mPICA territory cerebellar infarction

Findings	Patients
Head thrust test	Normal
SN	15
GEN	
Typical*	13
Unidirectional†	4
Gaze to only lesion side	7
Asymmetric pursuit‡	6
Asymmetric OKN	4
Canal paresis	None
Imbalance grade	
1	7
2	1
3	16
Direction	
Lesion side	17
Healthy side	7

Canal paresis was defined as side differences more than 22% at bithermal caloric stimulation.

* Direction-changed bidirectional gaze-evoked nystagmus that the intensity was maximal when gaze to the lesion side.

† Direction-fixed unidirectional gaze-evoked nystagmus beating toward the side of lesion.

‡ Ipsilateral impairment of smooth pursuit with frequent corrective saccade.

mPICA = medial branch of posterior inferior cerebellar artery; SN = spontaneous nystagmus; GEN = gaze evoked nystagmus; OKN = optokinetic nystagmus.



OUTILS CLINIQUES d'EVALUATION du RVO

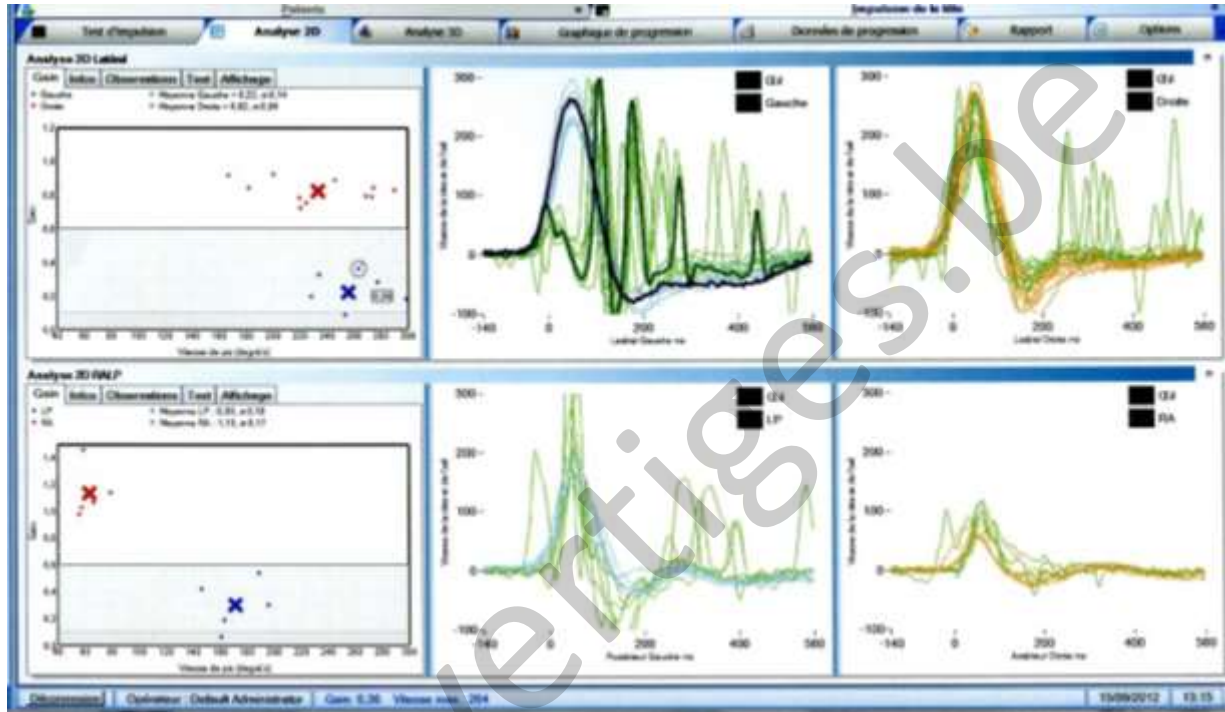
HIT - Head Impulse Test



www.Vertiges.be



VHIT



Otometrics



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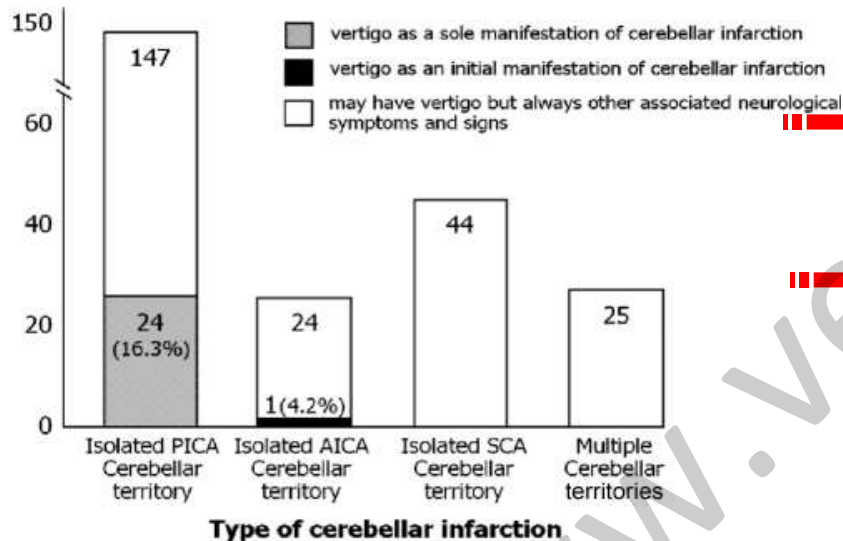


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Nystagmus du Regard Excentré (Gaze Evoked)

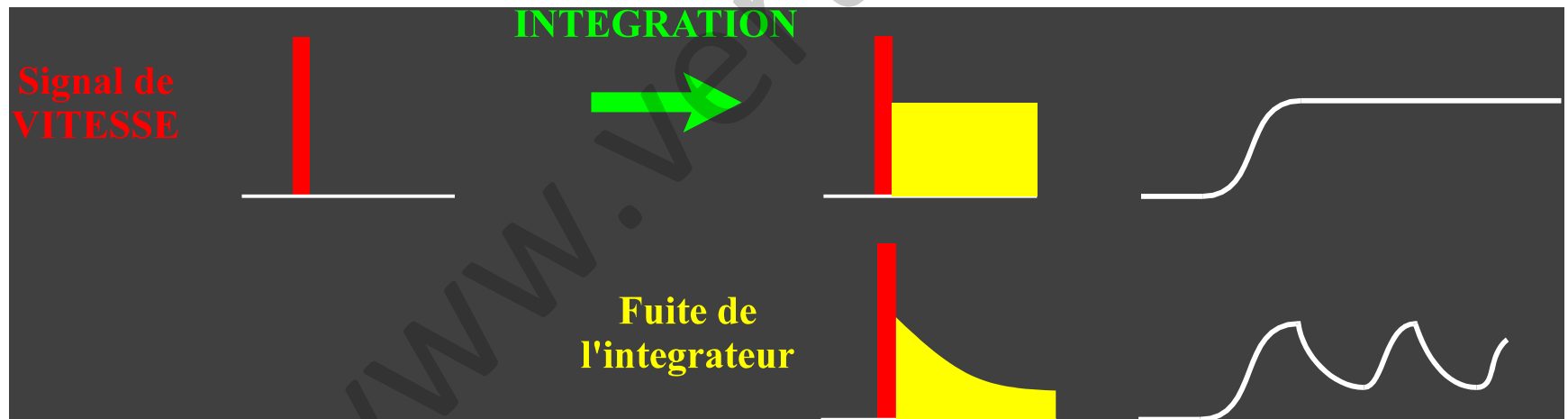


www.vertiges.be



PHYSIOPATHOLOGIE du GAZE EVOKED NYSTAGMUS

**FORCE INSUFFISANTE pour MAINTENIR
UN OEIL ou LES DEUX YEUX
dans UNE ou PLUSIEURS POSITIONS**



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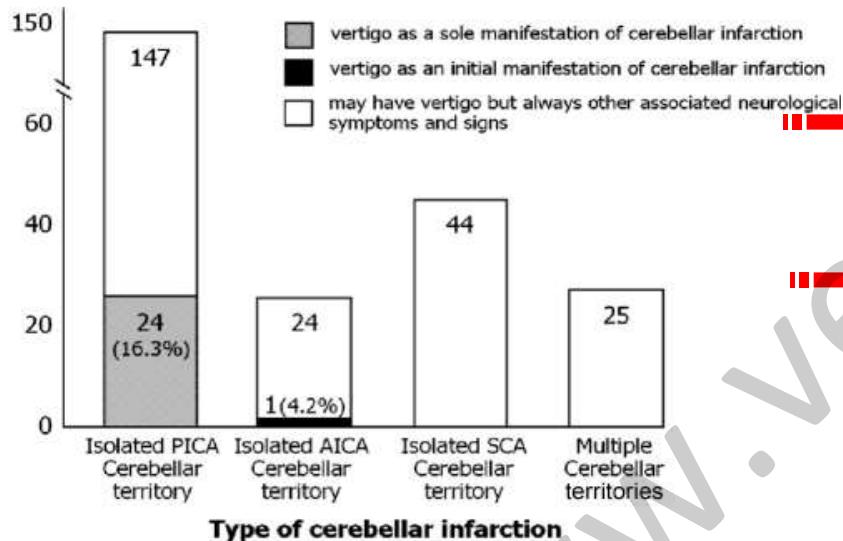


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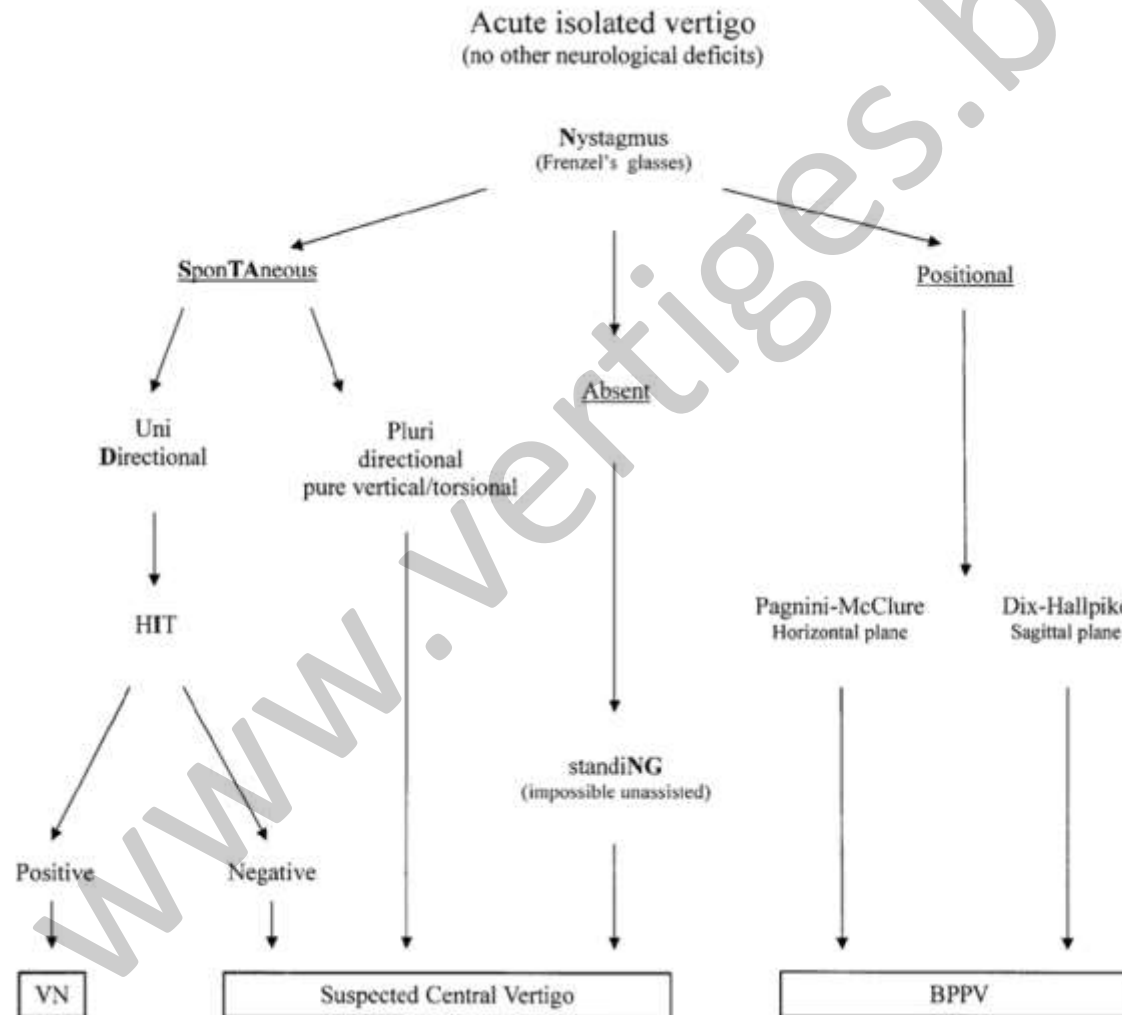
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STANDING, a four-step bedside algorithm for differential diagnosis of acute vertigo in the Emergency Department

ACTA OTORHINOLARYNGOLOGICA ITALICA 2014;34:419-426

S. VANNI¹, R. PECCI², C. CASATI¹, F. MORONI¹, M. RISSO¹, M. OTTAVIANI¹, P. NAZERIAN¹, S. GRIFONI¹, P. VANNUCCHI²



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Table III. STANDING test characteristics.

	Central vertigo Final diagnosis	Non-central vertigo Final diagnosis	Total
Central vertigo STANDING	11	5	16
Non-central vertigo STANDING	0	82	82
Total	11	87	98

Sensitivity: 100% (95% CI: 72.3-100%); specificity: 94.3% (95% CI: 90.7-94.3%); positive predictive value: 68.8% (95% CI: 49.7-68.8%); negative predictive value: 100% (95% CI: 96.3-100%).

www.vertiges.be



HINTS to Diagnose Stroke in the Acute Vestibular Syndrome

Three-Step Bedside Oculomotor Examination More Sensitive Than Early MRI Diffusion-Weighted Imaging (*Stroke*. 2009;40:3504-3510.)

Jorge C. Kattah, MD; Arun V. Talkad, MD; David Z. Wang, DO;
Yu-Hsiang Hsieh, PhD, MS; David E. Newman-Toker, MD, PhD

Table 1. Key Clinical Features in Patients With Peripheral Versus Central AVS

Symptoms, Signs, and Imaging at Presentation	PAVS (n=25)	CAVS (n=76)	NLR Central (95% CI)
Associated symptoms	12%	41%	0.67 (0.53–0.85)*
Acute auditory symptoms	0%†	3%	0.97 (0.94–1.01)
Headache or neck pain	12%	38%	0.70 (0.56–0.88)*
General neurological signs (including truncal ataxia)	0%	51%	0.49 (0.39–0.61)*
Facial palsy	0%	1%	0.99 (0.96–1.01)
Hemisensory loss	0%	3%	0.97 (0.94–1.01)
Crossed sensory loss	0%	3%	0.97 (0.94–1.01)
Dysphagia/dysarthria	0%	3%	0.97 (0.94–1.01)
Limb ataxia	0%	5%	0.95 (0.90–1.00)
Mental status abnormality (lethargy)	0%	7%	0.93 (0.88–0.99)
Hemiparesis (including UMN facial weakness)	0%	11%	0.89 (0.83–0.97)
Severe truncal instability (cannot sit unassisted)	0%	34%	0.66 (0.56–0.77)*



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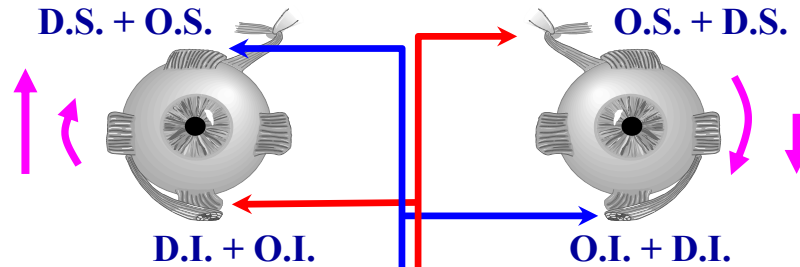
Symptoms, Signs, and Imaging at Presentation	PAVS (n=25)	CAVS (n=76)	NLR Central (95% CI)
Obvious oculomotor signs	0%	32%	0.68 (0.59–0.80)*
Dominantly vertical or torsional nystagmus	0%	12%	0.88 (0.81–0.96)
Oculomotor paralysis (3-4-6, INO, gaze palsy)	0%	21%	0.79 (0.70–0.89)*
Subtle oculomotor signs	4%	100%	0.00 (0.00–0.11)*
Direction-changing horizontal nystagmus	0%	20%	0.80 (0.72–0.90)*
Skew deviation present or untestable	4%‡	25%§	0.78 (0.67–0.91)*
h-HIT normal or untestable	0%	93%	0.07 (0.03–0.15)*
Initial imaging abnormal¶	92%	97%	0.33 (0.05–2.22)
Acute infarct or hemorrhage±chronic lesions	0%	86%	0.14 (0.08–0.25)*
Other acute pathology±chronic lesions	0%	1%	0.99 (0.96–1.01)
Only chronic lesions (leukoaraiosis)¶¶	92%	11%	11.18 (2.95–42.35)*



SKEW DEVIATION



La contre-torsion oculaire

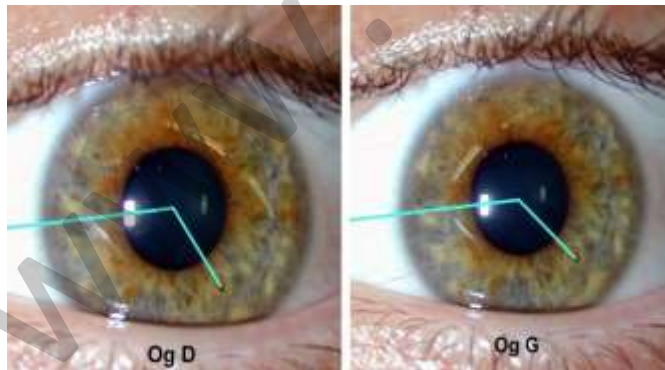


— Excitation
— Inhibition

Action Verticale D.S. > O.S.
Action de Torsion O.S. > D.S.



Tête inclinée de 45°
vers la droite

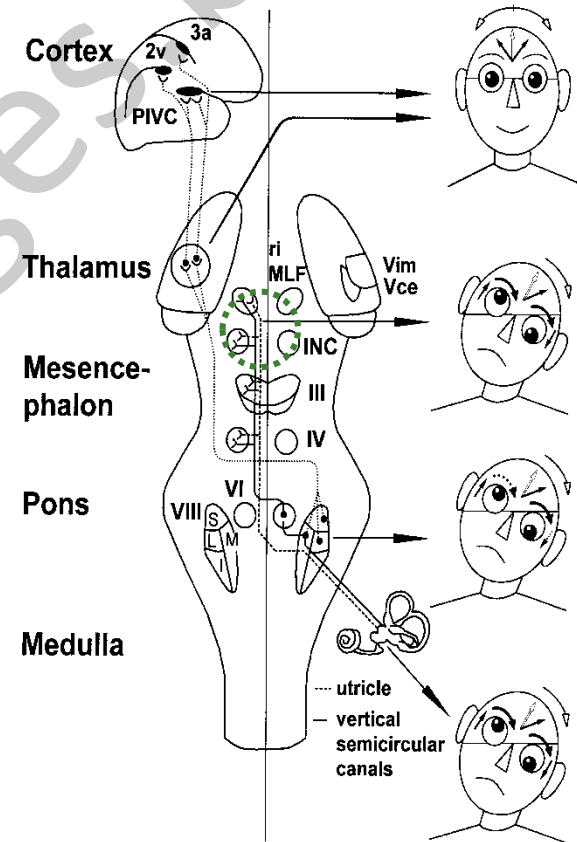
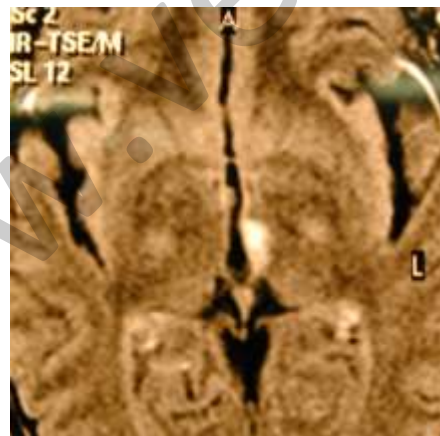
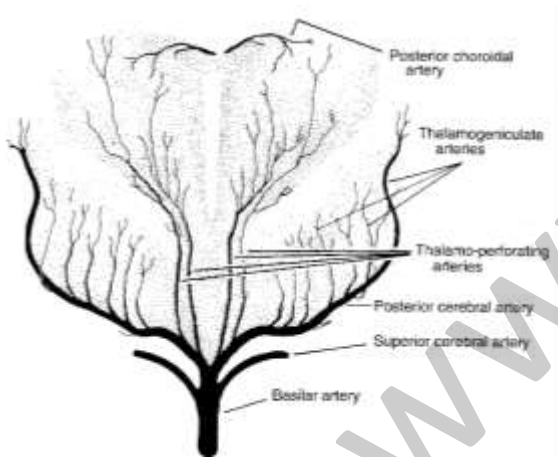
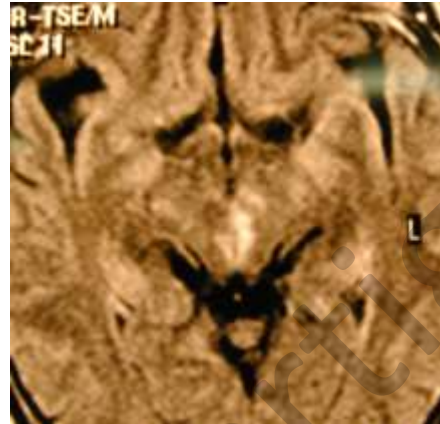
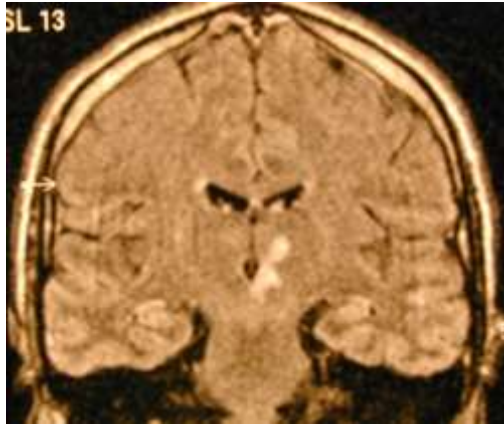


Tête inclinée de 45°
vers la gauche

Rotation autour de l'axe optique de 7,9°



INSTABILITE et OCULAR TILT REACTION par LESIONS THALAMIQUES PARAMEDIANES



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The presence of normal horizontal head impulse test, direction-changing nystagmus in eccentric gaze, or skew deviation (vertical ocular misalignment) was **100% sensitive and 96% specific for stroke**.

Skew was present in 17% and associated with brainstem lesions (4% peripheral, 4% pure cerebellar, 30% brainstem involvement).

Skew correctly predicted lateral pontine stroke in 2 of 3 cases in which an abnormal horizontal head impulse test erroneously suggested peripheral localization.

Initial MRI diffusion-weighted imaging was falsely negative in 12% (all 48 hours after symptom onset).



The Diagnostic Accuracy of Truncal Ataxia and HINTS as Cardinal Signs for Acute Vestibular Syndrome

Sergio Carmona^{1*}, Carlos Martinez², Guillermo Zalazar³, Marcela Moro⁴, Angel Batuecas-Caletrio², Leonel Luis^{4,5} and Carlos Gordon^{6,7}

Frontiers in Neurology

August 2018 | Volume 7 | Article 125

TABLE 3 | Sensitivity and specificity of each and combined sign.

	Sensitivity (MRI+) (%)	Specificity (MRI-) (%)
Direction-changing nystagmus	57	100
Skew	54.8	94.4
HIT	83	100
Ataxia 1 ^a	7.1	45.8
Ataxia 2 ^b	26.2	61.1
Ataxia 3 ^c	66.7	100
Ataxia 2-3	92.2	61.1
Asynergy+	92.9	100
HINTS	100	94.4
Ataxia 2-3 + direction-changing nystagmus	100	61.1
Ataxia 2-3 + skew	100	56.9
Ataxia 2-3 + HIT	100	61.1

^aAtaxia 1 walking independently.

^bAtaxia 2 cannot walk without support.

^cAtaxia 3 falling at upright posture.

TABLE 4 | Ataxia grade and final diagnosis.

	Peripheral (# of patients/%)	Central (# of patients/%)
0	5/6.9	-
1	39/54.2	3/7.1
2	28/38.9	11/26.2
3	-	28/66.7



The International Classification of Headache Disorders, 3rd edition (beta version)

Cephalalgia
33(9) 629–808

© International Headache Society 2013

A1.6.5 Vestibular migraine

Previously used terms:

Migraine-associated vertigo/dizziness; migraine-related vestibulopathy; migrainous vertigo.

Diagnostic criteria:

- A. At least five episodes fulfilling criteria C and D
- B. A current or past history of 1.1 Migraine without aura or 1.2 Migraine with aura¹
- C. Vestibular symptoms² of moderate or severe intensity,³ lasting between 5 minutes and 72 hours⁴
- D. At least 50% of episodes are associated with at least one of the following three migrainous features⁵:
 1. headache with at least two of the following four characteristics:
 - a) unilateral location
 - b) pulsating quality
 - c) moderate or severe intensity
 - d) aggravation by routine physical activity
 2. photophobia and phonophobia⁶
 3. visual aura⁷
- E. Not better accounted for by another ICHD-3 diagnosis or by another vestibular disorder⁸.

Vestibular migraine, include:

- a) spontaneous vertigo:
 - (i) internal vertigo (a false sensation of self-motion);
 - (ii) external vertigo (a false sensation that the visual surround is spinning or flowing);
 - b) positional vertigo, occurring after a change of head position;
 - c) visually induced vertigo, triggered by a complex or large moving visual stimulus;
 - d) head motion-induced vertigo, occurring during head motion;
 - e) head motion-induced dizziness with nausea (dizziness is characterized by a sensation of disturbed spatial orientation; other forms of dizziness are currently not included in the classification of vestibular migraine).
3. Vestibular symptoms are rated *moderate* when they interfere with but do not prevent daily activities and *severe* when daily activities cannot be continued.
 4. Duration of episodes is highly variable. About 30% of patients have episodes lasting minutes, 30% have attacks for hours and another 30% have attacks over several days. The remaining

recur. At the other end of the spectrum, there are patients who may take 4 weeks to recover fully from an episode. However, the core episode rarely exceeds 72 hours.



VERTIGES et MIGRAINE

Episodic vertigo related to migraine (90 cases): vestibular migraine ?
M. Dieterich and T. Brandt. J. Neurol. 1999; 246: 883-892.

Signes inter-crisis (asymptomatiques): 66 %

- Poursuite saccadée verticale : 48 %
- Poursuite saccadée horizontale : 22 %
- Gaze evoked nystagmus : 27 %
- Nystagmus spontané : 11 %
- Nystagmus de position : 11 %
- Nystagmus vertical inf.: 3.3 %
- Nystagmus vertical sup.: 2.2 %
- Déficit inhibition des RVO : 3.3 %



Vestibular migraine

Long-term follow-up of clinical symptoms and vestibulo-cochlear findings

Andrea Radtke, MD
Michael von Brevern,
MD
Hannelore Neuhauser,
MD, MPH

Tilman Hottenrott, MD
Thomas Lempert, MD

Table 1 Clinical characteristics of vertigo and concomitant symptoms in 61 patients with definite vestibular migraine

Vertigo	Initial presentation, %	Follow-up, %
Type ^a		
Spontaneous	85	95
Spinning	75	82
Positional	39	80
Isolated positional	13	5
Head-motion-induced	61	84
Episodes with recurrent short spells of spontaneous or positional vertigo	54	90
Unsteadiness	66	90
Duration of attacks ^a		
<1 min	31	75
1-5 min	30	56
5-60 min	34	64
<24 h	49	74
>24 h	52	69

Table 2 Interictal ocular motor abnormalities at initial presentation and on follow-up

Variable	Initial presentation (n = 60) ^a		Follow-up (n = 61)	
	No.	%	No.	%
Normal ocular motor function	51	85	36	59
At least one ocular motor abnormality	9	15	25	41
Positional nystagmus	7	12	17	28
Head-shaking nystagmus	1	2	9	15
Gaze-evoked nystagmus	—	—	2	4
Spontaneous nystagmus	1	2	1	2
Saccadic pursuit ^b	—	—	5	8
Deficit of VOR suppression	1	2	5	8
Pathological saccades	—	—	—	—
Unilateral VOR deficit on head-impulse test	1	2	2	3



VPPB versus VP migraineux

Nystagmus During Attacks of Vestibular Migraine
S S. Hartman et al., AAN Annual Meeting 2004

Intolérance aux mouvements de tête 76%

Nystagmus non paroxystique, persistant 100%
uniquement positionnel 13-58%

69% Nyst horizontaux, dont 72% direction constante en décubitus gauche ou droit.

5% Nyst. Verticaux

Symptômes migraineux (photophobie ...) souvent discrets, non concomitants
Céphalées : 56%.

Facteurs déclenchant migraineux

Vertiges positionnels récidivants

VP migraineux : 70% patients > 2 épisodes/an

VPPB : 15% récidive dans l'année

M. von Brevem et al, NEUROLOGY 2004;62:469-472



TiTrATE: A Novel Approach to Diagnosing Acute Dizziness and Vertigo

David E. Newman-Toker and Jonathan A. Edlow

Neurol Clin. 2015 August ; 33(3): 577–599.

Timing -Trigger - Targeted History/ Exam

Table 1

Timing-and-trigger-based 'vestibular' syndromes*

Timing	Triggers [†] Present	No Triggers
New, episodic	Triggered episodic vestibular syndrome (t-EVS) (e.g., positional vertigo from BPPV)	Spontaneous episodic vestibular syndrome (s-EVS) (e.g., cardiac arrhythmia)
New, continuous	Post-exposure acute vestibular syndrome (t-AVS) (e.g., post gentamicin)	Spontaneous acute vestibular syndrome (s-AVS) (e.g., posterior fossa stroke)
Chronic, persistent	Context-specific chronic vestibular syndrome (t-CVS) (e.g., uncompensated unilateral vestibular loss, present only with head movement)	Spontaneous chronic vestibular syndrome (s-CVS) (e.g., chronic, persistent dizziness associated with cerebellar degeneration)

* Note that the use of the word 'vestibular' here connotes vestibular *symptoms* (dizziness or vertigo or imbalance or lightheadedness, etc.), rather than underlying vestibular *causes* (e.g., benign paroxysmal positional vertigo, vestibular neuritis).

[†] 'Triggers' here for non-spontaneous forms refer to obligate triggers (EVS), exposures (AVS), and contexts (CVS) that sharply distinguish these forms from their spontaneous counterparts. Spontaneous causes, as defined here, sometimes have underlying predispositions or precipitants, but these are not 'only-and-always.'



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