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PERILYMPHATIC FISTULA VIDEONYSTAGMOGRAPHIC EVALUATION

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Introduction

ý Perilymphatic fistulas generated by blast appear to be common and are not exceptional. Patients are often admitted with a suggestive clinical picture with a particular context of exposure to strong detonation.
ý this clinical picture includes: attacks of rotating **vertigo ,** sometimes sensations of **imbalance, tinnitus, fluctuating mixed deafness.**
ý We report the results of a **videonystagmographic evaluation** during a **descriptive, prospective** analysis carried out in the HCA.

Population & Methods

ý **48** patients were recruited for vertigo (out of 156 cases presenting isolated or associated damage to the middle and inner ear.) occurring following exposure to an explosion (primary blast), during the period of June 2004 to June 2006.
ý The diagnosis of perilymphatic fistula was retained in **13** patients (who represent our target population in this study) who were subjected **to medication based on Acetozolamide associated with physical rest.**
Clinically:
ý The various **complaints** alleged by the patients were recorded to facilitate comparison with the data before, during and after treatment. A score was assigned to each clinical situation of vertigo.
ý Vestibular **examination :** looking for possible spontaneous deviations to know:
- Ocular: nystagmus by videonystagmoscopy
- Segmental: index tests
- Axial: the Romberg and Fukuda test.

ý **On the paraclinical level:**
ý **CT :** was performed on the 13 patients to look for a possible breach.

The nystagmography and caloric tests video:

Carried out on patients in whom the diagnosis of FPL was retained, a first examination was carried out on day 40, followed by another evaluation examination on day 100.

PRINCIPLE

The VNG allows: to record and measure with great precision the horizontal, vertical, and tortional components of eye movements based on the detection of the iris print and to quantify in 3D the speed of the eye movements.

INTEREST

- Specify the central or peripheral origin of the lesions.
- Determine the labyrinth in question.
- Quantify the level of impairment.

MATERIAL The VNG includes the following equipment: DIVN 26.
- software (allows the position of the eye to be recorded and the video image to be processed), a mask equipped with infrared lighting and a camera, a SONY TV monitor, and a printer.
- The caloric test includes: an adjustable thermostat and an irrigation gun with adjustable flow, all of which constitutes a variotherm.

TECHNICAL

with conditions :
- absence of tympanic perforation (otherwise, stimulation will be carried out with hot or cold air)
- absence of taking neuroleptics, or anti-vertigo drugs 1 or 2 days before
- patient lying down, head and trunk raised 30° from the horizontal,

b) - Practical implementation:
• each ear is irrigated either with cold water 30° or with hot water 44° for 30 seconds, then we wait 30 seconds,
- the response is recorded between the 60th and 90th second after the start of stimulation.
- hot tests precede cold tests, cold stimulation inhibits the ampulla of the *horizontal SCC,* while hot stimulation activates it; this has the effect of inducing ocular nystagmus beating on the side opposite to the cold stimulation and on the side of the stimulation to the hot test.

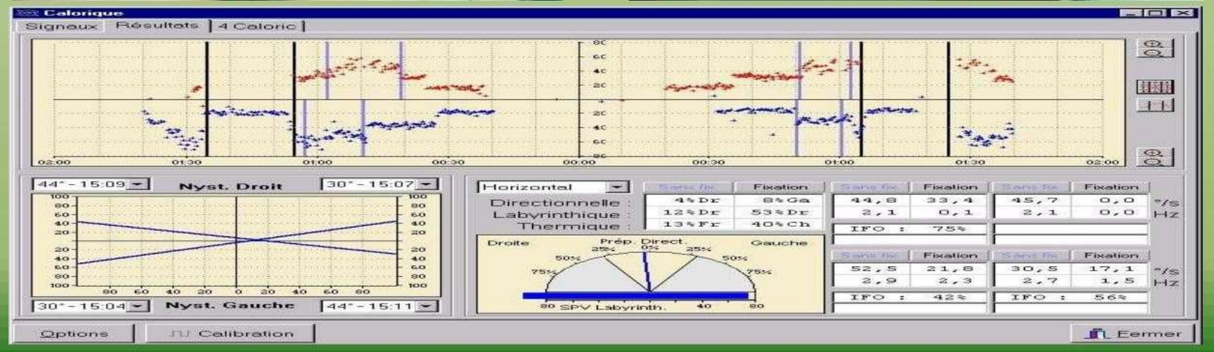
- nystagmus frequency and slow phase velocity amplitude are measured using video nystagmography.
- The values are then reported by the software on a graph: **FREYSS diagram,** which can be printed and then analyzed, which allows us to instantly visualize the parameters that we will analyze in our study. which are:

1-Reflectivity: the sum of the responses obtained for each of the two hot and cold stimulations for each of the two horizontal CSCs.
If R > 120 = hyper reflectivity
If R < 30 = hypo reflectivity
If R < 5 = areflexia

2- valence: it is the difference of the 2 reflectivities of the two ears / Sum of the reflectivities of the two ears * 100 (NV = < 15%)

3- directional predominance of nystagmus:
it is the sum of right nystagmus / sum of left nystagmus.
If the ratio > 1 = predominance of right nystagmus
If the ratio < 1 = predominance of left nystagmus

ý the existence of hypo reflectivity or vestibular hypo valence reflects the existence of an **asymmetry** of excitability between the ampullae of the right and left CSC, and corresponds to peripheral vestibular damage.



Results

ý Clinical data at the start of the study (d0):
The diagnosis of Peri-Lymphatic Fistula was made in **13 patients,**
Otoliquorrhea was discovered in 4 patients,
2 samples could be taken, a significant level of glucose was noted in 1 case,
• Other telltale signs of FPL:
Tullio phenomenon: 4 patients,
Valsalva vertigo: 1 patient.
ý The breach was radiologically latent in all cases
ý Clinical data at D40: Drying up of otoliquorrhea in the 4 patients.
-Unilateral hyporeflexia was found in 9 patients
-- Bilateral hyporeflexia in 3 patients
- Unilateral hyper-reflexia in 1 patient
-A contralateral directional preponderance was found in 6 Patients,
- ý VNG data at D 100 (3 months after the accident):
The percentage of recovery of vestibular function is **61.5% (8 patients).**
Directional preponderance and compensation have no localizing value.

VNG data at D40:
it was Ipsilateral in 4 other cases.

VNG data	Number of Patients (day 40)
Unilateral Hyporeflexia	09 69%
Bilateral Hyporeflexia	03 23%
Unilateral hyper reflexia	01 7.6%
Total	**13**

Preponderance Directional	Status at day 40	
	Ipsilateral	contralateral
Compensated	00	00
Uncompensated	04 40%	06 60%
Total	**10**	

STATUS At D40	STATUS A D100 (end of treatment)				
	Hyporeflexia Unilateral	Hyporeflexia Bilateral	Unilateral hypereflexia	Areflexia	Normal valence
Hyporeflexia Unilateral N=9 69%	**01** 11.1%	00 0%	00 0%	**01** 11.1%	**07** 77.7%
Bilateral hyporeflexia n=3 23%	**02**	00	00	**01**	00
Hyper reflexivity Unilateral N=01 7.7%	0	00	00	00	**01**
Areflexia N=00 0%	00	00	00	00	00
Total N=13 100%	**03** 23%	00 0%	00 0%	**02** 15.3%	**08** 61.5%

Directional preponderance j40	Status at day 100 (end of treatment)	
	Ipsilateral	Contralateral
Compensated N=0	03	04
Uncompensated N=10	01	02
Total N=10	04	06

Discussion

ý VNG is an essential examination for the objective evaluation and monitoring of vestibular lesions.
ý 100% of the VNG analysis was pathological on day 40
(only 80% was in Bénédict Bourgeois' study)
ý On day 40, the results of the VNG find:
Unilateral hyporeflexia 69% Bilateral hyporeflexia 23% Unilateral hyper-reflexia 7.6%
Figures which are similar to those published by Bourgeois (retrospective study 97 post-traumatic FPL, Nantes University Hospital)
ý The usual negativity of surgical exploration by retro-auricular route, the possible persistence of otoliquorrhea after intervention, the possibility of recurrence of the flow after spontaneous or post-operative drying up, and especially the occurrence of meningitis early or late, led us to reconsider the problem of this otorrhea.
ý 50 injured people with otoliquorrhea were followed between 1972 and 1977 at the Lille center. 12% of fistulas dried up spontaneously.
In our series the fistula dried up spontaneously in almost all cases.
ý An experimental study carried out at the University of SAO PAULO (Onishi, Fukuda) compared natural evolution to the surgical approach, the latter did not demonstrate statistically more effectiveness than natural evolution.
ý if there is a suspicion of perilymphatic fistula, medical treatment will be started:
fight against hyperpressure.
relieve disabling cochleo-vestibular symptoms. corticosteroids find
their place in the face of deafness.
ý surgery, in terms of FPL, represents the last diagnostic and therapeutic step. The indication and timing of surgery remain controversial in the literature

Conclusion

ý Spontaneous closure of the breach thanks to medical treatment associated with physical rest (supine decubitus) allowed us to obtain excellent results, with no patient having had a recurrence of otorrhea or meningitis.
ý Due to this risk as soon as the otorrhea does not dry up quickly, we believe it is legitimate to propose a simple and effective surgical intervention, the otological time allows an exact assessment of the lesions and the closure of the breach. ý The VNG carried out in good conditions allowed us an objective assessment of the evolution of the vestibular damage caused by the blast.

References

1. **GARTH** RJN.:Blast injury of the auditory system a review of mechanism and pathology. Laryngol Otol 1994; 108:925-929.
2. **LEIBOVICI D, GOFRIT ON:** Blast insulters. Bus versus open air bombings, a comparative study of injuries in survivors of open versus confined space explosion. J trauma 1996; 41:1030-1035.
3. **MESSERVY M, VINCEY P, BERTHELOT** B. Current aspects of auricular blast. Rev laryngology 1987; 108; 473-477.
4. **PATS B. LENOIR B. AUSSET** S. Blast and explosion injuries. EMC Anesthesia Resuscitation 1997; 36-725-D10: 11p.
5. **PESSEY JJ, DEGUINE O, WANNA** G. ENT pathology during explosions EMC 2004; 225 – 231