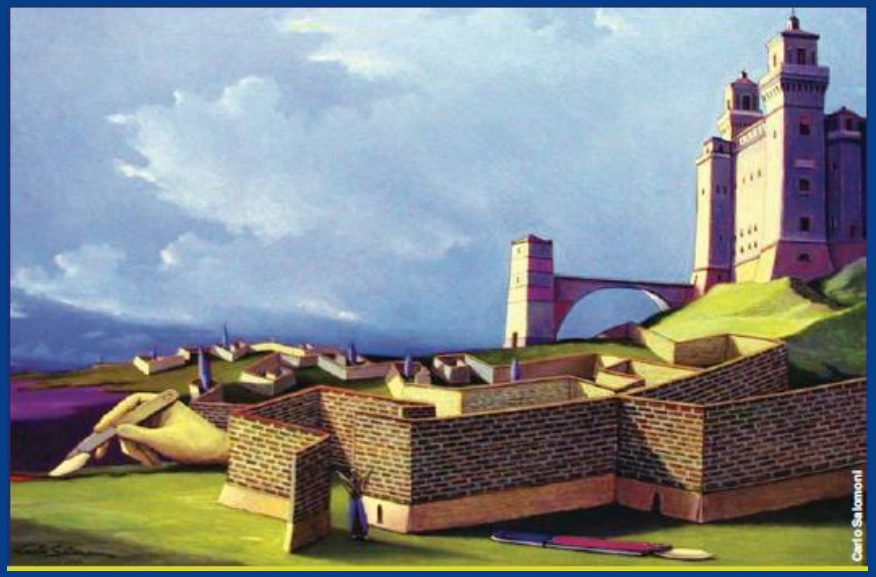

Results of Jugular PTA on symptoms of Menière's disease with concomitant CCSVI

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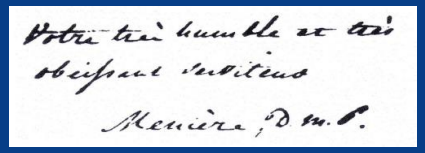
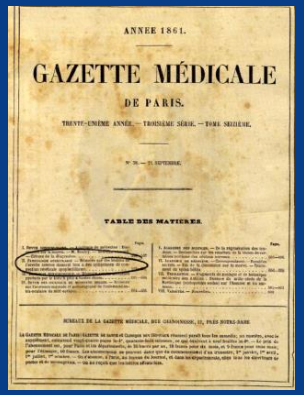
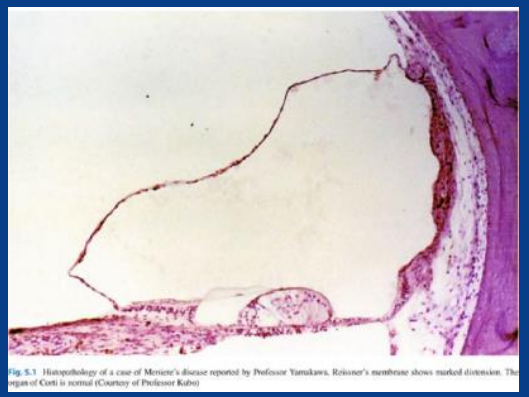






The syndrome was described in a young woman by the French Gynaecologist Prosper Menière in 1861 …. *but, probably, he missed the correct diagnosis*

«Meladie de l'oreille interne offarut les symptomes de la congestion cerebrate apoplectiforme» Paris, 1861

«Memoire sur des lesions de l'oreille interne donnant lieu a des symptomes de congestion cerebral apoplectiforme» Paris, 1861

In 1874, first Charcot defined the syndromic association «Vertigo, hypacusia, and tinnitus» as «Menière's disease»

In '30s of the 20th century, endolymphatic hydrops was recognized as its istopathological marker, considering it also as the main cause of MD symptoms (Hallpike,1938; Yamakawa, 1938, *indipendently)*

Diagnostic criteria for Menière's disease

Jose A. Lopez-Escamez[a,k,*], John Carey[b], Won-Ho Chung[c], Joel A. Goebel[d], Måns Magnusson[e], Marco Mandalà[f], David E. Newman-Toker[g], Michael Strupp[h], Mamoru Suzuki[i], Franco Trabalzini[f] and Alexandre Bisdorff[j]

AAO-HNS – American Academy Otolaryngology Head and Neck Surgery
CCBS – Classification Committee of the Bárány Society
EAONO – European Academy of Otology and Neurotology
ICVD – International Classification of Vestibular Disorders

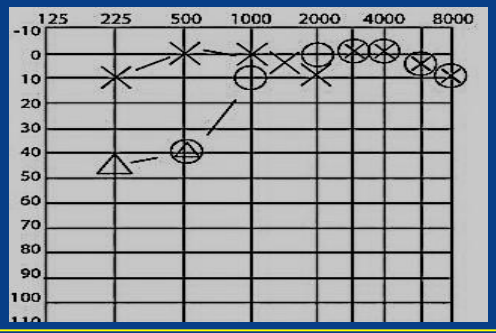
1. Definite MD

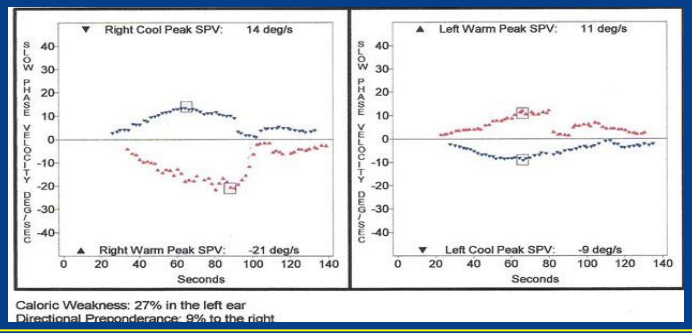
A. Two or more spontaneous[1] episodes of vertigo, each lasting 20 minutes to 12 hours[2]

B. Audiometrically documented low- to medium-frequency sensorineural hearing loss[3,4] in the affected ear on at least one occasion before, during or after one of the episodes of vertigo [5,6]

C. Fluctuating aural symptoms (hearing, tinnitus or fullness) in the affected ear[7]

E. Not better accounted for by another vestibular diagnosis [8]





Note that the last definition of MD (2015) is substantially identical to that Prosper Menière said in 1861!

ISNVD

International Society of Neurovascular Disease

9th annual meeting

May 30-31, 2019, University of Ferrara - Italy

Aula Magna - S. Anna University-Hospital, Cona Via Aldo Moro 8

At home of vascular surgeons what an Otologist could asK and what could he say to them?

CCSVI AND MENIERE'S DISEASE

Is it possible to hypothesize that CCSVI for either anatomical or functional alterations represents a predisposing factor for developing inner ear disorders like MD?

1. **Does an epidemiological link between MD and CCSVI exist?**
2. **Is treatment of CCSVI through Percutaneous Transluminal jugular Angioplasty (PTA) effective on MD symptoms?**

- In a previous session Dr. Aldo Bruno explained how we think CCSVI and Menière's disease could be linked
  - Jugular outflow venous disturbances could provoke venous hypertension in inner ear, disrupting inner ear fluids omeostasis and their flow
  - Open questions: links between CSF flow and pressure and inner ear fluids flow and pressure
- Prof. Robert Guerkov just told us what hydrops is and how we can see it
- Prof. Eleuterio Toro just presented his mathematical model on computational inner ear circulation, validating the effects of jugular stenosis on inner ear circulation
- I'm going to say if, in our experience, CCSVI and MD are epidemiologically linked and which are the results of PTA on MD symptoms, when CCSVI and MD are concomitant

Results of Jugular PTA on symptoms of Menière's disease with concomitant CCSVI

Our clinical series 2013-2019

520 Patients with definite Meniere's disease

250 men, 270 women

Age 54 +/- 15.3 years

102 healthy «non vestibular» subjects*

48 men and 54 women

Age 49.3 +/- 7.8

*** not relatives to Menière's disease patients**

CCSVI Positivity (Echo color Doppler assessment: Zamboni diagnostic criteria for CCSVI)

OUR DIAGNOSTIC RESULTS

- **416/520 MD Patients (80%)**
- **12/102 Healthy subjects (11.8%)**

P <0.001

In a large series of patients, CCSVI and MD are frequently associated conditions

Our Clinical series of concomitant CCSVI and MD

Vascular Surgeon: Aldo Bruno, Telese Terme, Benevento (Italy)

April 2013-April 2019

Therapeutic phase through PTA was primarily focused to correct anatomical and functional anomalies of CCSVI condition (primary outcome).

The collateral aim was the improvement of MD symptoms (secondary outcome*).

* Note that the secondary outcome was the most desired by MD patients (and by her/his Otoneurologist).

Our Clinical series of concomitant CCSVI and MD

Vascular Surgeon: Aldo Bruno, Telese Terme, Benevento (Italy)

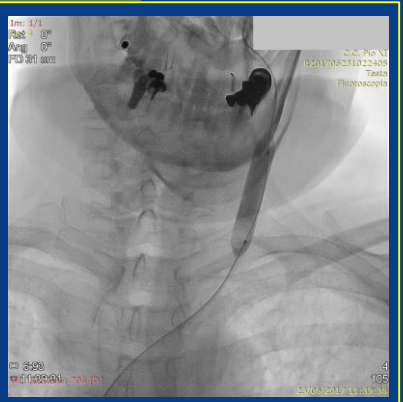
April 2013-April 2019

Therapeutic phase through PTA

151 PTA PROCEDURES

- 70 Male
- 81 Female

Mean Age: 47 years.



Unilateral Meniere's Disease : 105 cases
Bilateral Meniere's disease: 46 cases
Onset of the disease from 1 to 28 years

All patients, either unilateral or bilateral MD, were operated bilaterally

Dr Aldo Bruno presented the primary outcome (results on CCSVI anomalies)

24 month follow-up results of PTA on Meniere's disease symptoms

By Otologist Evaluation

24 month follow-up because:

- In a short time follow up the placebo effect could act on results
- American Academy of Otolaryngology (AAO) 1995-2015 guidelines recommended the evaluation of therapy after a 24 month followup
- In a 24 month follow-up PTA anatomic and functional results on CCSVI are stabilized

110 patients reached a 24 month follow-up
82 Unilateral MD, 28 Bilateral MD patients

Optimal expected benefits on MD symptoms

- Improvement of hearing
- Reduction of vertigo spells (number and intensity)
- Subjective reduction of tinnitus and fullness
- Improvement of Quality of Life

24 MONTH FOLLOW-UP

Hearing

Hearing loss is not significantly improved, but it appears stabilized

Only in 5/110 patients hearing improved in a clinical significant way (25-40 dB)

	PTA 0.5-3 kHz
Improved (>10dB)*	22 (20%)
Unchanged (± 10dB)	70 (63.6%)
Worsened (>10dB)	18 (16.4%)

Pre- Angioplasty Pure Tone Average: 52.9 dB
Post- Angioplasty Pure Tone Average: 49.8 dB
P=0.19 (NS)

24 MONTH FOLLOW-UP

Good outcome on vertigo spells control (number and intensity)

$$\frac{\text{Avg spells/month post-treatment (24 months recommended)}}{\text{Avg spells/month pre-treatment (6 months recommended)}} \times 100 = \text{Control Level}$$

AVG spells/month pre ± SD	2.9±1.3
AVG spells/month post ±SD	0.05±0.8

A 0 = complete control
B 1-40 = substantial control
C 41-80 = limited control
D 81-120 = insignificant control
E > 120 = worse
F Secondary treatment required due to disabling vertigo

Good outcome classes

«Benchmark»= Intratympanic (IT) gentamycin:
A+B class control ≈ 90-95%

Two main differences:

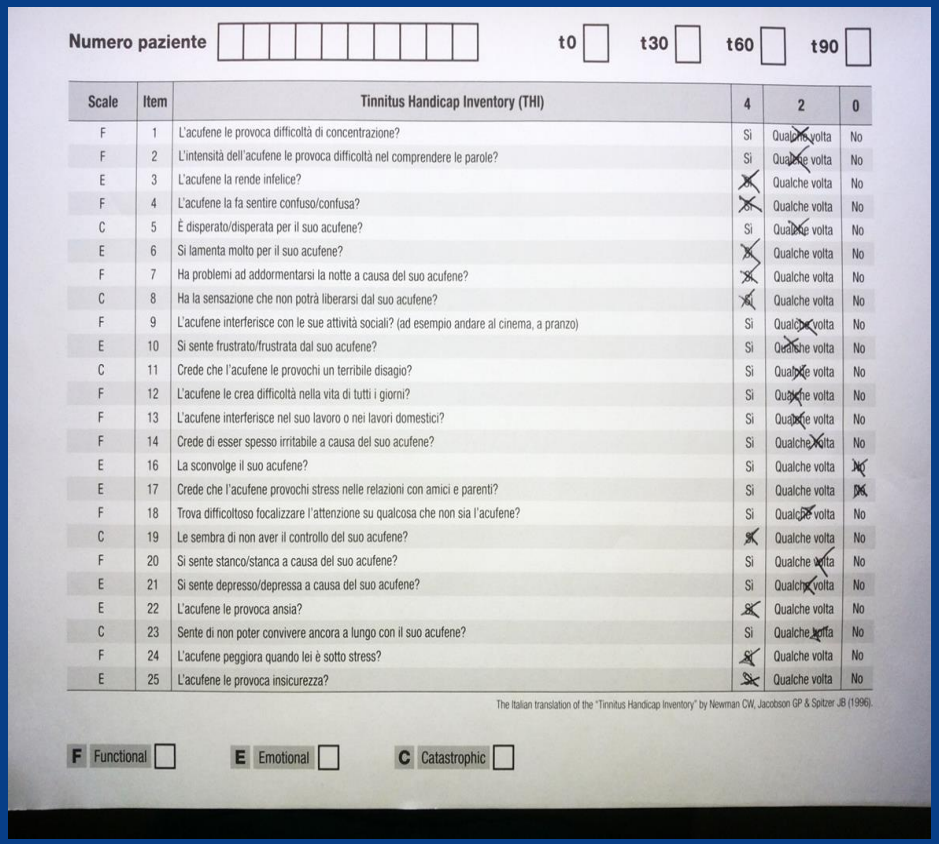
1. IT gentamycin works as a chemical subablative therapy on vestibular function, whereas PTA is a «conservative» approach to the inner ear functions
2. IT gentamycin works in a much shorter time than PTA

24 MONTH FOLLOW-UP

A good outcome for aural fullness, not for tinnitus

Tinnitus and fullness: subjective evaluations		
	TINNITUS	**FULLNESS**
Disappeared	0	0
Improved	39 (35%)	77 (70%)
Unchanged	60 (55%)	33 (30%)
Worsened	11 (10%)	0

Tinnitus
A structured judgment
(Tinnitus Handicap Inventory)



Numero paziente ☐☐☐☐☐☐☐☐☐☐ t0 ☐ t30 ☐ t60 ☐ t90 ☐

Scale	Item	Tinnitus Handicap Inventory (THI)	4	2	0
F	1	L'acufene le provoca difficoltà di concentrazione?	Si	Qualche volta	No
F	2	L'intensità dell'acufene le provoca difficoltà nel comprendere le parole?	Si	Qualche volta	No
E	3	L'acufene la rende infelice?	Si	Qualche volta	No
F	4	L'acufene la fa sentire confuso/confusa?	Si	Qualche volta	No
C	5	È disperato/disperata per il suo acufene?	Si	Qualche volta	No
E	6	Si lamenta molto per il suo acufene?	Si	Qualche volta	No
F	7	Ha problemi ad addormentarsi la notte a causa del suo acufene?	Si	Qualche volta	No
C	8	Ha la sensazione che non potrà liberarsi dal suo acufene?	Si	Qualche volta	No
F	9	L'acufene interferisce con le sue attività sociali? (ad esempio andare al cinema, a pranzo)	Si	Qualche volta	No
E	10	Si sente frustrato/frustrata dal suo acufene?	Si	Qualche volta	No
C	11	Crede che l'acufene le provochi un terribile disagio?	Si	Qualche volta	No
F	12	L'acufene le crea difficoltà nella vita di tutti i giorni?	Si	Qualche volta	No
F	13	L'acufene interferisce nel suo lavoro o nei lavori domestici?	Si	Qualche volta	No
F	14	Crede di esser spesso irritabile a causa del suo acufene?	Si	Qualche volta	No
E	16	La sconvolge il suo acufene?	Si	Qualche volta	No
E	17	Crede che l'acufene provochi stress nelle relazioni con amici e parenti?	Si	Qualche volta	No
F	18	Trova difficoltoso focalizzare l'attenzione su qualcosa che non sia l'acufene?	Si	Qualche volta	No
C	19	Le sembra di non aver il controllo del suo acufene?	Si	Qualche volta	No
F	20	Si sente stanco/stanca a causa del suo acufene?	Si	Qualche volta	No
E	21	Si sente depresso/depressa a causa del suo acufene?	Si	Qualche volta	No
E	22	L'acufene le provoca ansia?	Si	Qualche volta	No
C	23	Sente di non poter convivere ancora a lungo con il suo acufene?	Si	Qualche volta	No
F	24	L'acufene peggiora quando lei è sotto stress?	Si	Qualche volta	No
E	25	L'acufene le provoca insicurezza?	Si	Qualche volta	No

The Italian translation of the "Tinnitus Handicap Inventory" by Newman CW, Jacobson GP & Spitzer JB (1996).

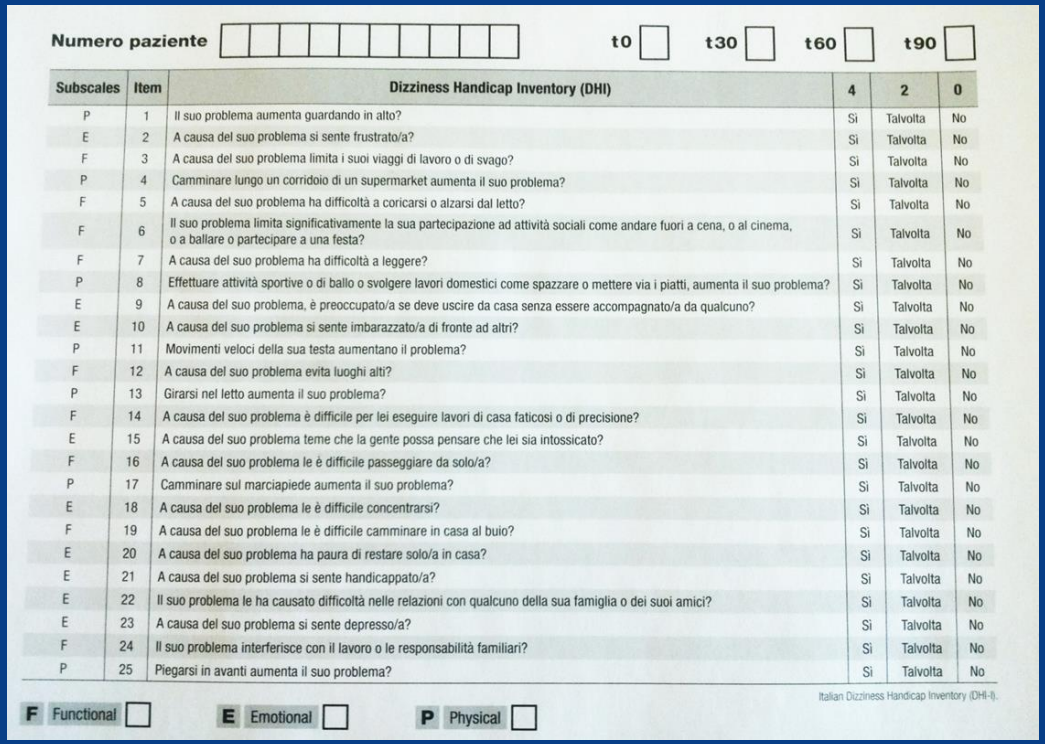
F Functional ☐ E Emotional ☐ C Catastrophic ☐

Pre-PTA		THI value	56.7
Post-PTA		THI value	49.9
P=0.32 (N.S.)			

The structured judgment confirmed the «brute» one:
poor outcome in tinnitus control

24 MONTH FOLLOW-UP

Quality of Life (Dizziness Handicap Inventory, DHI)



Numero paziente ☐☐☐☐☐☐☐☐☐☐ t0 ☐ t30 ☐ t60 ☐ t90 ☐

Subscales	Item	Dizziness Handicap Inventory (DHI)	4	2	0
P	1	Il suo problema aumenta guardando in alto?	Si	Talvolta	No
E	2	A causa del suo problema si sente frustrato/a?	Si	Talvolta	No
F	3	A causa del suo problema limita i suoi viaggi di lavoro o di svago?	Si	Talvolta	No
P	4	Camminare lungo un corridoio di un supermarket aumenta il suo problema?	Si	Talvolta	No
F	5	A causa del suo problema ha difficoltà a coricarsi o alzarsi dal letto?	Si	Talvolta	No
F	6	Il suo problema limita significativamente la sua partecipazione ad attività sociali come andare fuori a cena, o al cinema, o a ballare o partecipare a una festa?	Si	Talvolta	No
F	7	A causa del suo problema ha difficoltà a leggere?	Si	Talvolta	No
P	8	Effettuare attività sportive o di ballo o svolgere lavori domestici come spazzare o mettere via i piatti, aumenta il suo problema?	Si	Talvolta	No
E	9	A causa del suo problema, è preoccupato/a se deve uscire da casa senza essere accompagnato/a da qualcuno?	Si	Talvolta	No
E	10	A causa del suo problema si sente imbarazzato/a di fronte ad altri?	Si	Talvolta	No
P	11	Movimenti veloci della sua testa aumentano il problema?	Si	Talvolta	No
F	12	A causa del suo problema evita luoghi alti?	Si	Talvolta	No
P	13	Girarsi nel letto aumenta il suo problema?	Si	Talvolta	No
F	14	A causa del suo problema è difficile per lei eseguire lavori di casa faticosi o di precisione?	Si	Talvolta	No
E	15	A causa del suo problema teme che la gente possa pensare che lei sia intossicato?	Si	Talvolta	No
F	16	A causa del suo problema le è difficile passeggiare da solo/a?	Si	Talvolta	No
P	17	Camminare sul marciapiede aumenta il suo problema?	Si	Talvolta	No
E	18	A causa del suo problema le è difficile concentrarsi?	Si	Talvolta	No
F	19	A causa del suo problema le è difficile camminare in casa al buio?	Si	Talvolta	No
E	20	A causa del suo problema ha paura di restare solo/a in casa?	Si	Talvolta	No
E	21	A causa del suo problema si sente handicappato/a?	Si	Talvolta	No
E	22	Il suo problema le ha causato difficoltà nelle relazioni con qualcuno della sua famiglia o dei suoi amici?	Si	Talvolta	No
E	23	A causa del suo problema si sente depresso/a?	Si	Talvolta	No
F	24	Il suo problema interferisce con il lavoro o le responsabilità familiari?	Si	Talvolta	No
P	25	Piegarsi in avanti aumenta il suo problema?	Si	Talvolta	No

Italian Dizziness Handicap Inventory (DHI-I).

F Functional ☐ E Emotional ☐ P Physical ☐

Physical and emotional scales showed both the greatest involvement before PTA and the greatest improvement after PTA

pre PTA DHI value 59.3
post PTA DHI value 30.7
$P<0.0001$

Clinicians measure, patients feel.
What happened using a very simple patient-oriented assessment?

Better or worst? This is the question.
A simplified version of Glasgow Benefit Inventory

Better	85/110 (77%)
Unchanged	18/110 (17%)
Worse	7/110 (6%)

«Better» is significantly prevalent

78 patients reached also a 36 Month follow-up, substantially maintaning the benefits recorded at 24 Month follow-up

We can affirm that

- CCSVI and MD are frequently associated conditions
- PTA procedure cures anatomic and functional CCSVI anomalies
- In a two year follow-up, PTA procedure gives a good control of MD symptoms, particulary of vertigo spells- the most disabling symptom- and of aural fullness.
- For hearing loss, our data show its stabilization in a two year follow-up, if compared to medical conventional therapy *(soon to be published data)*

We cannot affirm that

- CCSVI is the major cause of MD
- PTA “cures” MD

The stasis of the venous flow in the head and neck may be considered a further etio-pathogenetic mechanism of MD, which adds to many other already known.

MD still remains a multifactorial disease

Most of the «dark side» is still to be studied.
Our most powerful weapons have to be both our knowledge and intellectual honesty, giving up on many of our current certainties, if necessary.