

A Hearing Impairment Patient Combined With Noise Exposure and Blood Pb Elevation

何國榮¹; 王肇齡¹; 何啓功^{1,2}; 戴嘉言¹; 莊弘毅¹
1.高雄醫學大學附設醫院職業及環境醫學科 2.高雄市政府衛生局
報告者: 何國榮醫師

Case Introduction

- Mr Lee
- A 50 year old man

Occupational History

- 在某大型造、修船廠工作超過20年，其主要工作為船艙電機、電器、及電路的維護及維修。而電器維修的工作包含**更換鉛蓄電池的零件(2000年12月~2001年1月)**，且部分的電池只能更換其中的電極版。
- 環境噪音測定顯示工作場所為**高噪音作業環境**，但在病患工作的早期並沒有使用任何聽力防護具。

Chief Complaint

- 
- Feb, 2001: Blood Pb: **89.9** ug/dL at health exam and tinnitus
 - April, 2001: Visit KMUH OEM OPD

Physical Examination

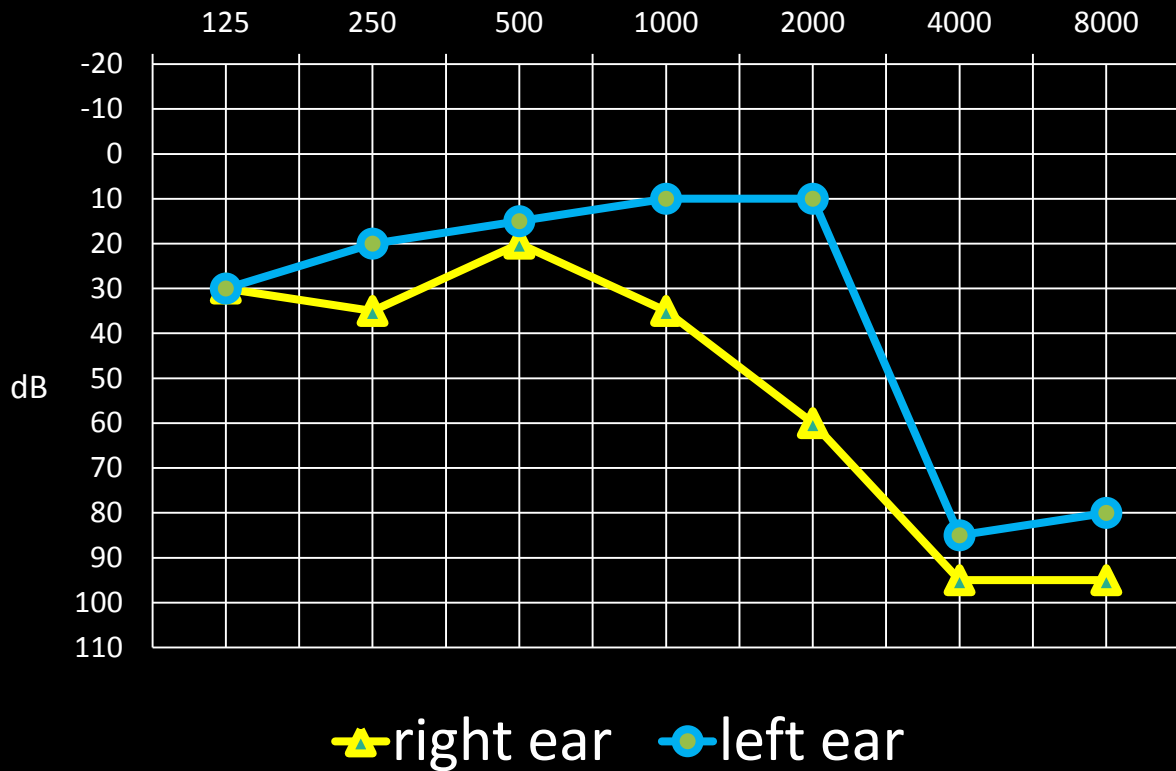
- Conscious: E4V5M6
- Conjunctiva: not pale
- Chest: Unremarkable
- Heart: Unremarkable
- Abdomen: soft, no tender point or rebounding pain
- Lead line in gum: negative
- Extremity: freely movable, no weakness
- Hearing: **bilaterally impaired**

Lab Data

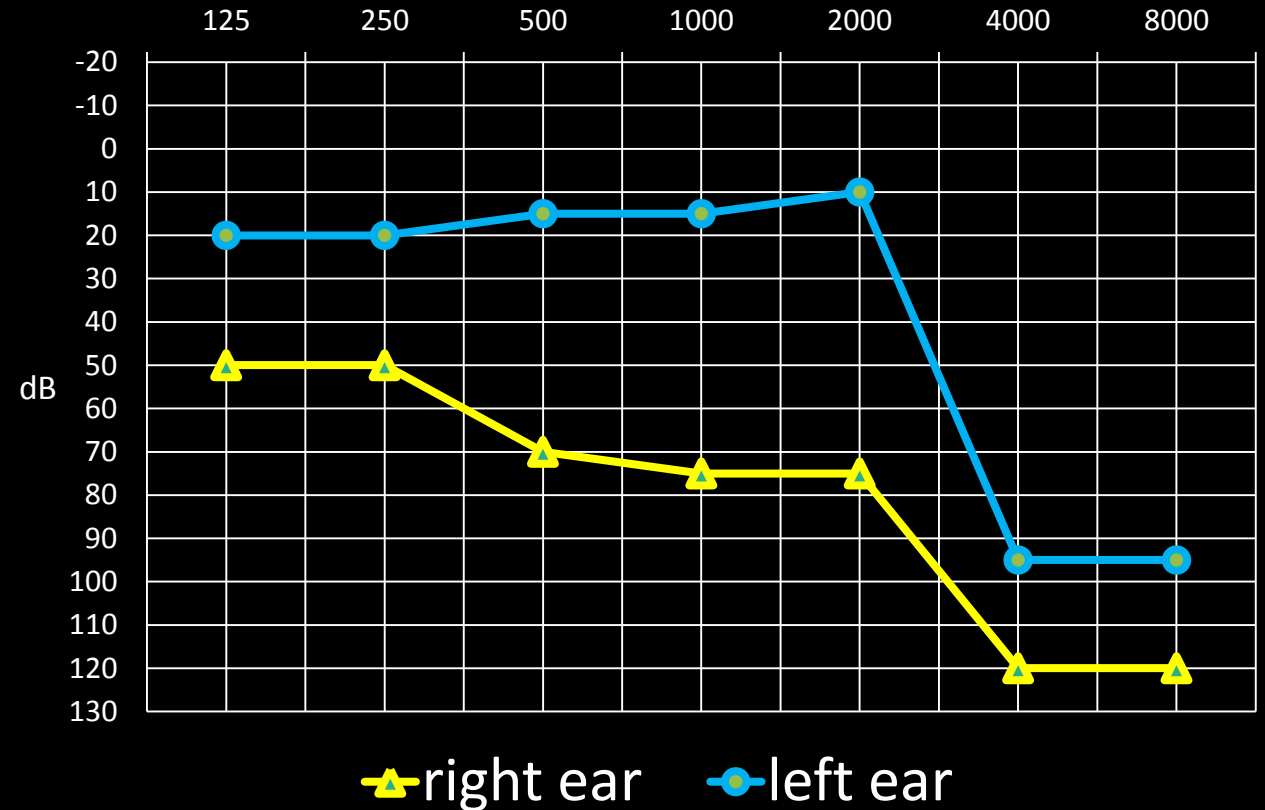
	WBC	RBC	Hb	Plt	BUN	Cr	ALT	AST	Blood Pb	Urine Protein
Feb,2001			15.5		33	2.8			89.9	
4/11,2001	10230	5.14M	16.2	118k	36.5	2.87	39	42	49.9	Neg
7/4, 2001					26.3	3.15	35	33	41.1	

Pure Tone Audiogram

PTA in Aug 18, 1999



PTA in April 11, 2001



ENT OPD

- Symptom: tinnitus, vertigo, right fullness(+)
- External ear: pseudocyst
- Impression: 1. Vestibular neuronitis
2. Bilateral sensorineural hearing loss

Diagnosis

1. Severe high pitch hearing impairment over the left ear and moderate to severe whole pitch hearing impairment over the right ear
2. Elevated blood Pb level
3. Renal insufficiency

Discussion

1. The BAER in children with high serum lead: significant linear regression relationship in the latent periods of wave II and wave IV

Nicolo Castellino, Pietro Castellino, and Nicola Sannolo inorganic lead exposure: metabolism and intoxication. Boca Raton, Fla.: Lewis Publishers, 1995.

2. Children with low to moderate lead absorption: constant prolonged BAER latency was found in repetitive test

[Otto D](#), [Robinson G](#), [Baumann S](#), [Schroeder S](#), [Mushak P](#), [Kleinbaum D](#), [Boone L](#). 5-year follow-up study of children with low-to- moderate lead absorption: electrophysiological evaluation. [Environ Res](#). 1985 Oct;38(1):168-86.

3. 5717 children: elevated hearing thresholds in 500Hz, 1000Hz, 2000Hz and 4000Hz increased significantly with increasing serum lead levels of both ears.

[Schwartz J](#), [Otto D](#). Blood lead, hearing thresholds, and neurobehavioral development in children and youth. [Arch Environ Health](#). 1987 May-Jun;42(3):153-60.

4. Both lead exposure and noise exposure could lead to hearing loss, and the former is significant in low audio such as 400-500Hz and the latter is in high audio such as 4000HZ

[Forst LS](#), [Freels S](#), [Persky V](#). Occupational lead exposure and hearing loss. [J Occup Environ Med](#). 1997 Jul;39(7):658-60.

5. Bilateral BAER tests on participants with elevated blood Pb levels (mean, 47.0 micrograms/dL) showed delayed wave latencies consistent with sensory-neural hearing impairment

[Counter SA](#), [Buchanan LH](#). Neuro-ototoxicity in andean adults with chronic lead and noise exposure. [J Occup Environ Med](#). 2002 Jan;44(1):30-8.



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