

Autoimmune Sensorineural Hearing Loss/Meniere's Disease possibly Triggered by Neurocysticercosis

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Abstract

Background: Meniere's disease (MD) occurs when an abnormal amount of fluid causes increased pressure in the inner ear or labyrinth, and its symptoms include vertigo, tinnitus, hearing loss, and a feeling of fullness in the ear. Various triggers for MD have been recognized, ranging from smoking and alcohol consumption to recent viral illness, allergies, and anxiety.

Case Report: a 37-year-old Hispanic male and native of southern Honduras presented with dizziness and tinnitus, which progressed to include left-sided sensorineural hearing loss. The patient was clinically diagnosed with Meniere's Disease and referred to otolaryngology. Laboratory work-up was positive for anti-HSP antibody and abnormal electrocochleography, left greater than right. His vestibulogramp was positive for both central and peripheral findings and bithermal caloric irrigations suggested abnormal peripheral function with a 57% weakness in the left ear.

Despite dietary and lifestyle modifications, as well as treatment with oral steroids, his symptoms persisted. Further history revealed that he had been treated for a tapeworm infection at age 14, in his Honduran village. An MRI of the brain then revealed a post-inflammatory calcification in the right parietal lobe as well as generalized volume loss, greater than would be expected for the patient's age. The patient was also referred to rheumatology and neurology and was diagnosed with neurocysticercosis.

Conclusion: To our knowledge, this is the first report of Meniere's disease possibly triggered by or concurrent with neurocysticercosis. This highlights the importance of a thorough work up to look for neurologic comorbidity for patients presenting with Meniere's disease

BACKGROUND/CASE REPORT

- ❖ Various triggers for MD have been recognized and range from smoking and alcohol consumption to recent viral illness, allergies, and anxiety yet the exact etiology and pathogenesis remains uncertain.
- ❖ An autoimmune etiology has been proposed in almost a third of patients although the immunological mechanisms involved remain uncertain

History of Presenting Illness and Clinical Course

- ❖ 37 y/o Hispanic male and native of Honduras presented with episodic vertigo, nausea, tinnitus and hearing loss.
- ❖ Sx exacerbated by dehydration and ingestion of salty foods
- ❖ Presumptively treated for Meniere's Disease with dietary, lifestyle modifications and oral steroids.
- ❖ Pt returned with unremitting sx;
- ❖ Focused history: diagnosed with tapeworm infection at age 14, in his home village, prior to arrival in the US
- ❖ MRI ordered and patient also referred to Rheumatology and Neurology.

DIAGNOSTIC WORK UP AND RESULTS

Laboratory Testing

CBC and CMP within normal limits

C-Reactive protein	1 mg/L	(0-10)
Sedimentation Rate	8 mm/hr	(0-15)
Anticardiolipin Ab, IgA, Qn	<9 APL U/ml	(0-11)
Anticardiolipin Ab, IgG, Qn	<9 GPL U/ml	(0-14)
Anticardiolipin Ab, IgM Qn	<9 MPL U/ml	(0-12)
Beta-2 Glycoprotein Ab, IgA	<9 GPI IgA units	(0-25)
Beta-2 Glycoprotein Ab, IgA	<9 GPI IgG units	(0-20)
Beta-2 Glycoprotein Ab, IgA	<9 GPI IgM units	(0-32)

Lyme IgG/IgM Ab NEGATIVE

ANA – NEGATIVE

Rheumatoid Arthritis Factor NEGATIVE

TSH 2.020 uIU/mL (0.450-4.500)

Anti 68kD (hsp 70) Abs POSITIVE (ABNORMAL)

ECOG: An ECOG was obtained using a slow rate alternating click presented at 70dB HL in the right ear and 90 dB HL in the left ear due to unilateral hearing loss. Responses were averaged to approximately 1500-3000 sweeps. The SP/AP ratios were averaged from the best 3 waveforms obtained. An SP/AP ratio of 50% or greater is considered abnormal. Right SP/AP Ratio = 67.4% and left SP/AP Ratio = 66.7%. ECOG morphology was considered very good, and results were consistent with hydrops or increased perilymphatic pressure bilaterally.

VNG: Testing showed no significant gaze, spontaneous or positional nystagmus. Saccadic eye velocity and latency were within normal limits. Visual pursuit was abnormal with low gain. Optokinetic tests were within normal limits bilaterally. The Dix-Hallpike test was negative both sides. Subclinical nystagmus was noted during head and body left testing (less than 3 degrees of left beating). Bithermal Caloric irrigations were suggestive of abnormal peripheral function with a 57% weakness in the left ear.

Audiologic evaluation showed significant low frequency sensorineural hearing loss (SNHL) in the left ear which persisted over time and then, over the course of a year, patient also developed low frequency hearing loss in the right ear (figures 2a and 2b). Such bilateral, fluctuating low frequency hearing loss is highly suggestive of Meniere's Disease.

MRI showed a 3 mm post inflammatory calcification in the right parietal lobe, confirming a diagnosis of Neurocysticercosis

FIGURE 1a and 1b Sequential Audiograms from 10/16/2020 and 12/3/2021

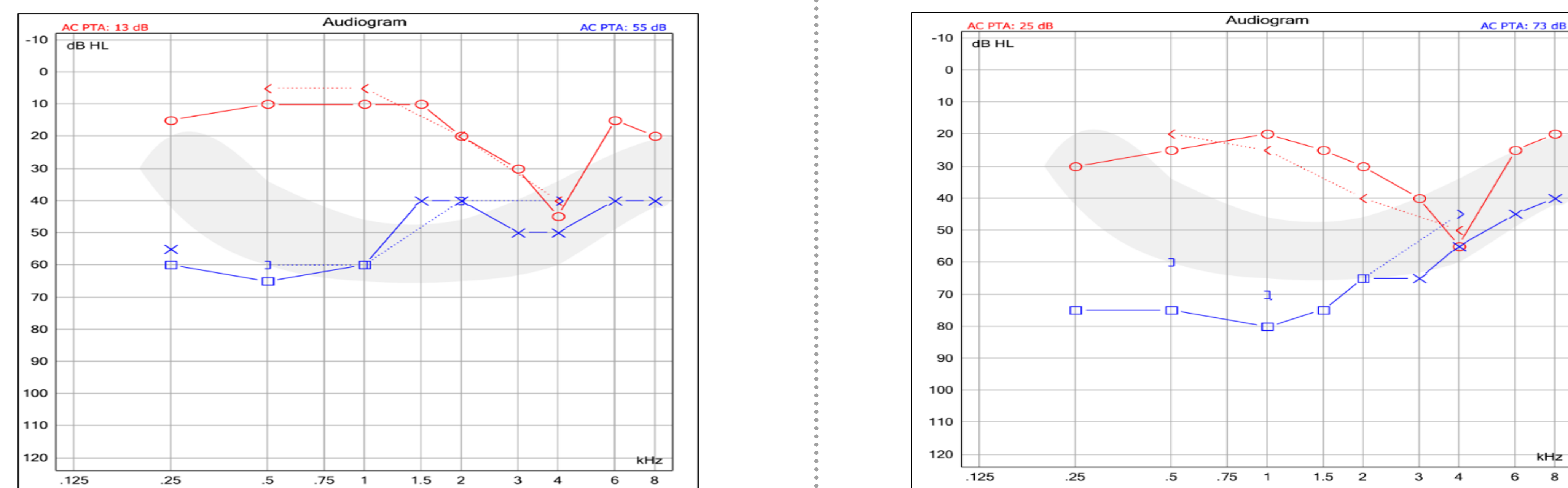
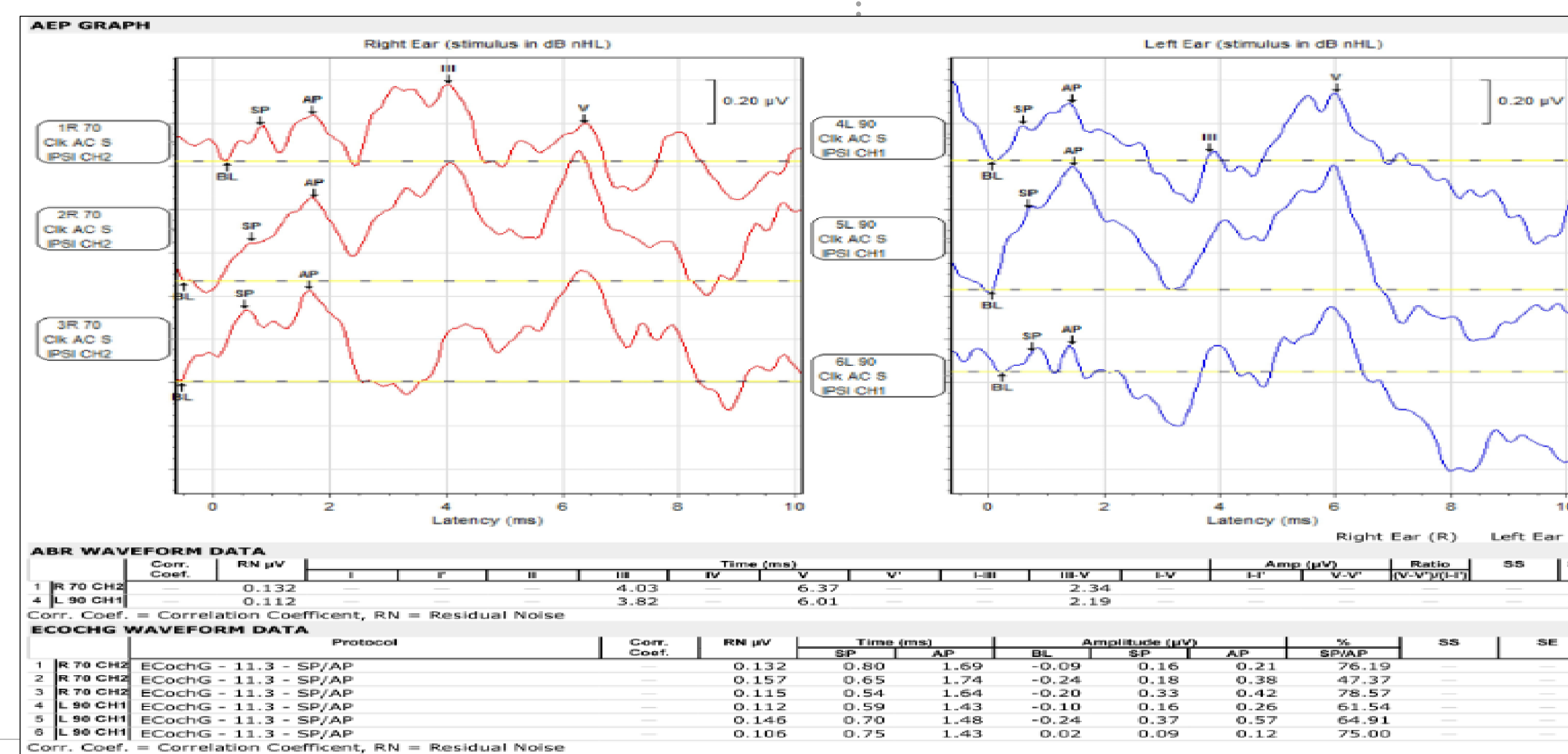
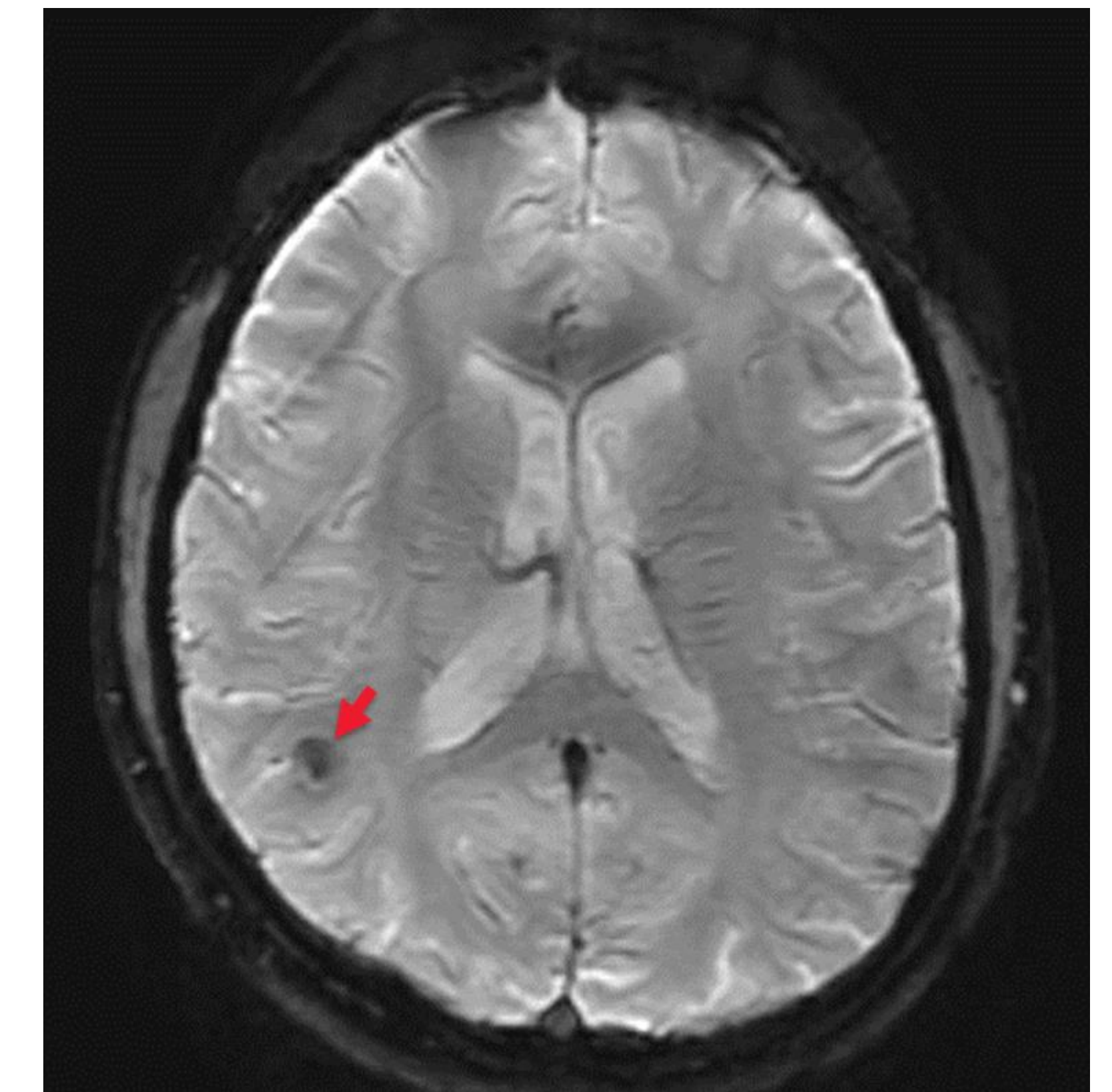


FIGURE 2: Electrocochleogram



RADIOGRAPHIC FINDINGS - MRI



CASE DISCUSSION/CONCLUSIONS

- ❖ Meniere's Disease: abnormal amount of fluid causing increased pressure in the inner ear; sx include vertigo, tinnitus, hearing loss, and fullness in the ear; triggers include viral illness, allergies and anxiety
- ❖ Approximately one-third of Meniere's disease cases seem to be of an autoimmune origin although the immunological mechanisms involved are not clear (Greco et al 2012).
- ❖ Neurocysticercosis typically seen developing countries; caused by the larval form of the parasite Taenia solium infecting the central nervous system; commonly presents with seizures
- ❖ Anti-HSP proteins seen in cases of MD are also seen in parasitic infections
- ❖ To our knowledge, this is the first reported case in the literature of Meniere's disease that may have been triggered by or concurrently with neurocysticercosis.
- ❖ This highlights the importance of a thorough work up to look for neurologic comorbidity for patients presenting with Meniere's disease as well as considering the environmental context for a patient's presentation.

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