

Audiovestibular Recovery in Acute Labyrinthitis following Early Intervention: A Case Report

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ABSTRACT

Background: Acute labyrinthitis is an infection in the inner ear, which is characterised by the sudden onset of vertigo, nausea, tinnitus and sensorineural hearing loss. Since incidences of acute labyrinthitis are rare, there is limited literature on the audiovestibular outcomes as well.

Objective: To report the symptoms, diagnostic evaluation, treatment, and outcome of a case of acute labyrinthitis to bring awareness of the early diagnosis leading to early recovery.

Case Report: A lady in her late 40's presented within two days of sudden-onset unilateral hearing loss associated with dizziness. Detailed audiological and vestibular assessments were suggestive of labyrinthitis. The patient was managed with appropriate medical therapy and early vestibular rehabilitation.

Conclusion: This report emphasises the importance of early intervention in restoring hearing and vestibular function. It highlights the importance for all clinicians to be aware of the need for early diagnosis, timely intervention, leading to early recovery of audio-vestibular function.

Key Words: Acute labyrinthitis, Intratympanic steroids, Vestibular rehabilitation, Case report

INTRODUCTION

Labyrinthitis is an inner ear inflammation characterised by the sudden onset of vertigo, nausea, tinnitus and sensorineural hearing loss.¹ The incidence and prevalence of labyrinthitis remain poorly defined. Nonetheless, available data suggest a higher incidence with increasing age.² Labyrinthitis can be caused by viral, bacterial, autoimmune or idiopathic. Earlier, bacterial labyrinthitis was a well-recognised complication of bacterial meningitis and otitis media, but it has become rare due to the use of antibiotics.³ Now, in the absence of meningitis or otitis media, labyrinthitis is most commonly presumed to be viral in origin, although a causative agent is rarely identified.⁴ In elderly patients, a vascular etiology has also been proposed.⁵ In the absence of an underlying cause, idiopathic labyrinthitis is the term used. Diagnosis is usually clinical, which can be confirmed with an audiovestibular test and radiological images like magnetic resonance imaging (MRI) of brain. Management varies depending on the etiology. The prognosis of idiopathic labyrinthitis was the worst of all the causes, with only 20% patients having normal

hearing recovery and 70% patients with residual vestibular symptoms.¹

We report a case of idiopathic labyrinthitis that presented to us within 48 hrs of the onset of symptoms. An audiovestibular test and an MRI brain was done. Early diagnosis with prompt management improved the audiovestibular symptoms significantly.

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This case report has been written to raise awareness of this cause as prompt management for hearing and vestibular rehabilitation can bring back hearing and balance in one's life.

CASE REPORT

A woman in her late 40's presented to the otolaryngology outpatient department in a wheelchair with a two-day history of sudden-onset severe dizziness and imbalance, which was aggravated by head movements and associated with nausea. She also noticed a sudden onset of hearing loss in left ear which was accompanied by tinnitus during the same period. She did not give any history which was suggestive of upper respiratory tract infection, loud noise exposure, head trauma, or ear discharge.

On general examination, the patient was conscious, oriented to time, place, and person, with stable vital signs. Otoloscopic examination showed normal external auditory canals and intact tympanic membranes in both ears.

A positive head impulse test, with a corrective catch-up saccade on rapid head rotation toward the affected left side, indicates left-sided vestibular hypofunction. Horizontal torsional nystagmus was seen toward the fast phase that is right side. Neurological examination was normal.

Pure tone audiometry showed profound sensorineural hearing loss in the left ear, while hearing thresholds were normal in the right ear. Cervical and ocular vestibular evoked myogenic potential (VEMP) testing showed absent waveforms on the left side, showing impairment of the left vestibular nerve. (Fig. 1a)

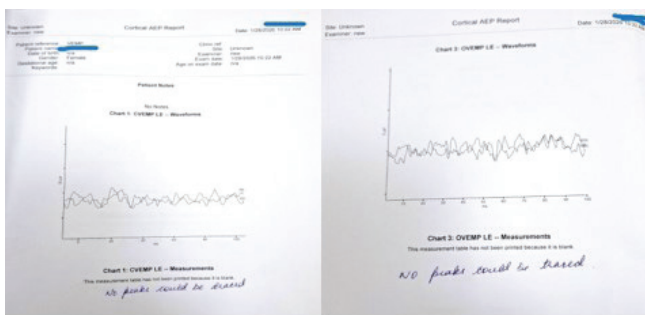


Fig. 1a: Both cVEMP and oVEMP were found to be absent on the left ear

In view of the acute onset of vestibular and cochlear symptoms and the absence of middle ear pathology or central pathology, a diagnosis of acute idiopathic labyrinthitis was made. She was admitted and started on oral prednisolone at a dose of 50 mg/day based on her weight, which was gradually tapered over three weeks. In addition, intratympanic dexamethasone (4 mg) was given on days 1, 3, and 5.

ANA (Anti-nuclear antibody) was negative, HIV test was non-reactive, complete blood counts were normal. MRI Brain revealed no brain pathology.

Significant clinical improvement was observed during follow-up. Hearing thresholds improved from profound to moderate,

and subsequently to mild sensorineural hearing loss within two weeks of treatment. (Fig. 1b) Vestibular rehabilitation therapy was initiated during the acute phase, consisting of 4 steps in lying down position for initial 3 days (Fig. 2) followed by exercises in the sitting position for 6 days (Fig. 3) and standing position in the next 6 days (Fig. 4).

By the end of two weeks, the patient was able to stand independently and perform vestibular exercises without support, with marked reduction in vertigo and imbalance.

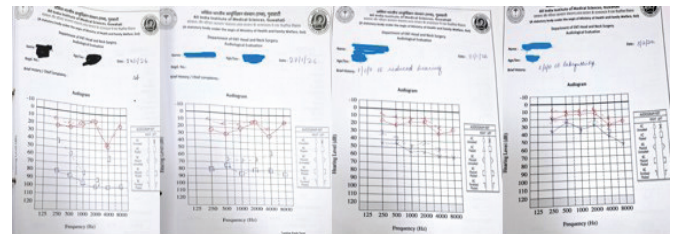


Fig. 1b: PTA showing profound hearing loss to mild sensorineural hearing loss after giving intratympanic and systemic steroids.



Fig. 2: Acute-phase vestibular rehabilitation in supine position: gaze shift to the affected and normal sides, lifting the affected leg with inward and outward foot movements, followed by head elevation using elbow support with forward gaze. Each position is held for 10 seconds

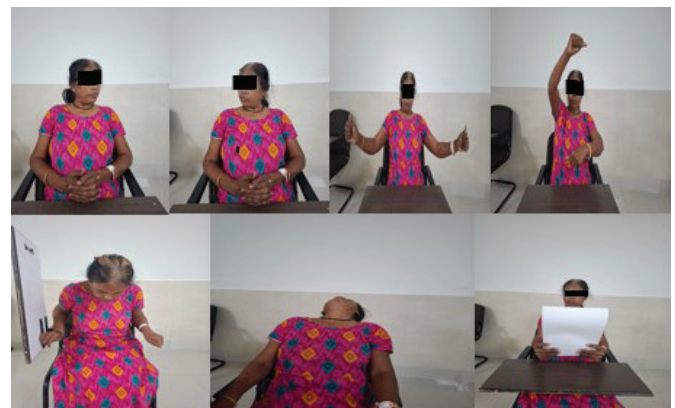


Fig. 3: Vestibular rehabilitation in recovery phase- in the sitting position: gaze is shifted toward the affected and normal sides, arm are outstretched followed with horizontal and vertical gaze movements, forward flexion and extension while holding a chair, and reading in the horizontal plane and vertical plane.



Fig. 4: Vestibular rehabilitation in recovery phase- in the standing position: patient is asked to stand straight with open eyes then with closed eyes, followed by standing in one leg first on the unaffected side later on the affected side. Arms are outstretched followed with exchanging the object from one hand to the other.

DISCUSSION

Acute Labyrinthitis is characterised by the sudden onset of vertigo, nausea, tinnitus and sensorineural hearing loss.¹ Indicating the involvement of both the cochlear and vestibular components of the inner ear. In the antibiotic era, suppurative labyrinthitis has become very rare; acute labyrinthitis is now most often presumed to be viral or idiopathic in origin.⁴ At present there is no worldwide criteria for labyrinthitis, as a result many have incorporated the diagnostic criteria by the Barany society for idiopathic labyrinthitis which is characterised by acute and sustained vertigo lasting for at least 24 hrs, unilateral sensorineural hearing loss presenting within 72 hrs of at least 30db in 3 consecutive frequencies, spontaneous horizontal torsional nystagmus and positive head impulse test.⁶ Prompt identification of the condition is essential for early management and recovery. Very simple yet effective test is the Head impulse test with refixation saccades helps in differentiating peripheral from central cause.⁷ VEMP (Vestibular evoked myogenic potential) which has two components, namely cervical VEMP (cVEMP) and ocular VEMP (oVEMP) is a relatively new entity used in the diagnosis of vestibular part of labyrinthitis. It tells us about the functionality of the vestibular nerve. If both cVEMP and oVEMP are absent it is suggestive that inferior and superior vestibular nerve are not functioning.⁸

MRI features in cases of acute labyrinthitis shows diffuse enhancement along the vestibulocochlear nerve along the intracanalicular course. For the management of sensorineural hearing loss there are studies suggesting that a combination of intratympanic corticosteroid with systemic steroid is better than monotherapy alone; however some study states that the outcome is the same with monotherapy or combined therapy.⁹ In the setting of idiopathic acute labyrinthitis, there is no role of antiviral therapy.¹⁰ Intratympanic steroid injection between dexamethasone and Trichloroacetic acid (TCA) shows almost similar results.¹¹ It is best when intratympanic and systemic

steroids are started as early as within 72 hours of onset of the symptoms. There are studies and randomised control trials that confirm that early vestibular rehabilitation helps in decreasing the perception of dizziness and early recovery, and thus improving the quality of life.¹² Surgery plays no role in cases of acute labyrinthitis.

Studies have shown that only around 20% cases improve in hearing and around 70% patients suffer with persistent balance issues.¹ Therefore, it is all the more important for prompt diagnosis and early intervention, as the earlier the intervention the better the outcome. Early audiovestibular assessment along with VEMP, helps in early diagnosis. Clinicians should be made aware of this condition to initiate early intervention and for better functional outcome.

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