

Ayurvedic Management of Sensory Neural Hearing Loss: A Case Report

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ABSTRACT:

Sensorineural hearing loss (SNHL) is known issue for children who suffer from bacterial meningitis, and it can result in lasting damage to their hearing and speech abilities. Traditional treatments are limited and mostly aimed at helping patients adapt to the condition. This case report focuses on a 7-year old boy who developed bilateral sensorineural hearing loss after suffering from Pneumococcal meningitis. His condition was further worsened by acute mastoiditis and Cerebral venous sinus thrombosis, with the right side being more affected. He was advised to use a hearing aid, but the parents chose a different treatment approach. In Ayurveda, this condition is related to *Badhirya*. [Hearing loss] It occurs due to an imbalance in *Vata* and *Kapha* doshas, which affects the sense of hearing, *Shravanendriya* [Ears], . The Ayurvedic treatment plan included internal medicines [*Rajanyadi choornam* one teaspoon with honey and ghee, *Ashtachoornam* one teaspoon with hotwater, *Krimigna Vati* one tablet each twice a day, *kombanjadi Gulika* one tablet each twice a day, *Gopi chandanadi Gulika* one tablet each twice a day, *Rasna dasamoola ghritham* one teaspoon twice a day, *Aswagandha choornam* and *Swetha sankupushpi choornam* half teaspoon each with milk] and external treatments for 21 days, with follow-ups every three months. After three treatment cycles, the results of the Pure Tone Average (PTA) showed improvement in both ears. In the right ear, the PTA improved from 117 dBHL to 106.6 dBHL, and in the left ear, it improved from 120 dBHL to 68.3 dBHL. The right ear was affected by Acute mastoiditis and Cerebral venous sinus thrombosis. This case shows the possible role of *Ayurveda* as a complementary treatment for Post-meningitic sensorineural hearing loss. Clinically, there was noted improvement in the left ear, along with a slight improvement in the right ear.

KEYWORDS: Acute mastoiditis, *Badhirya*, Cerebral venous sinus thrombosis, Pneumococcal meningitis, Sensorineural hearing loss (SNHL), *Shravanendriya*, *Vata Kapha doshas*.

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INTRODUCTION:

Hearing is the ability to detect sound by sensing vibrations through the ears. It is one of the five main senses and involves a complex interaction between the ears and the brain. This ability is necessary for daily tasks like listening to music, identifying the direction of sound and communication. In children, significant hearing loss can affect speech and reading development, which in turn can hinder academic performance and future career opportunities. Hearing loss that occurs later in life, such as during a gradual decline, can lead to social withdrawal and feelings of isolation and depression. If not treated, hearing loss in midlife is the most preventable risk factor for cognitive decline and dementia [1,2].

Currently, hearing loss is the most common sensory disorder among humans and is a widespread chronic condition in older adults. According to the World Health Organization [3], approximately 432 million adults and 34 million children globally have disabling hearing impairments, and this number is expected to rise to 700 million by 2050, which would represent about 10% of the world's population. As people get older, the chance of experiencing hearing difficulties increases, with about 60% of adults over 50 facing some level of hearing problem [4]. *Acharya Susruta* classified 28 *Karna-Rogas* in the *Uttara Tantra*, and *Badhirya* is one of them [5]. In *Ayurveda*, the sense of hearing (*Sravanendriya*) is linked with the *Akasha Mahabhoota*. Sound (*Shabda*) travels through *Vata*, aided by the presence of *Akasha* (space), and reaches

the *Indriya Adhishthana* (Ears), where it is transmitted through the *Indriya to Sravana Buddhi*, which is responsible for sound perception. Thus, *Vata* plays a crucial role in the normal hearing process. According to *Acharya Sushruta*, when *Vata Dosh*a becomes imbalanced and combines with *Kapha*, it resides in *Shabdhanuvaha Sira*, and without proper treatment, the person will likely develop *Badhirya* [6]. *Acharya Dalhana* has noted that not only *Vata Dosh*a but also *Rakta*, *Pitta*, and *Kapha Dosh*as can settle in *Shabdhanuvaha Sira*, causing *Badhirya* [7]. Meningitis is the most common cause of acquired severe to profound sensorineural hearing loss (SNHL) in children. Similarly, deafness is the most common long-term neurological complication of this disease. One important consequence of meningitis is the development of labyrinthitis ossificans, in which new bone forms inside the otic capsule [8]. Labyrinth ossification can happen within days of meningitis, complicating cochlear implantation. Among the various microorganisms causing bacterial meningitis, *Streptococcus pneumoniae* is associated with more severe hearing loss. Vaccines are available for meningitis. The MMR vaccine, which protects against mumps, measles, and rubella, also offers some protection against meningitis, which may occur as a complication of these diseases. Pneumococcal vaccines also help in preventing hearing loss due to otitis media: the use of the 13-valent pneumococcal vaccine has been shown to reduce the occurrence of pneumococcal otitis media in children.

Timely treatment of bacterial meningitis with appropriate antibiotics is essential. Broad-spectrum antibiotics should be administered early and adjusted based on bacterial isolation and antibiotic sensitivity results. Ceftazidime is a first-line treatment for preventing otogenic and meningogenic labyrinthitis as it reaches higher concentrations in the perilymph and cerebrospinal fluid (CSF) compared to other CSF-penetrating agents such as cefuroxime and cefotaxime. Evidence is growing that corticosteroids can reduce the incidence of hearing loss in both children and adults. The greatest benefit is achieved when corticosteroids are given early in the course of meningitis. Several human and animal studies have shown that steroid-induced immunosuppression may help reduce hearing loss associated with bacterial meningitis [9]. Every newborn should be tested for hearing loss as soon as possible, as well as individuals who have had meningitis.

The most accessible test is OAE, which can indicate the presence of hearing loss. For more in-depth evaluation, evoked-response audiometry is highly effective in detecting SNHL and is useful for diagnosing hearing loss in young, uncooperative children [10]. While temporal bone CT scans can effectively show ossification related to meningitis, MRI provides additional information when partial ossification has occurred. Early detection of deafness following meningitis is thus essential. Therefore, it is important to prioritize patients with meningitis for cochlear implantation [11]. Susruta has mentioned general treatment approaches for *Karnaroga*. It

includes *Snehana*, *Swedana*, *Ghritha pana*, *Rasayana Sevana* [according to *Dalhana Teeka – Mamsa Rasa Sevana*], avoiding excessive work, taking baths except for the head, avoiding sexual activity, and limiting excessive talking [12]. *Acharya Charaka* [13] and *Acharya Vagbhata* [14] have recommended daily *Karnapurana* to prevent ear diseases. The treatment modalities mentioned for *Badhira* are *Snehavirechana*, *Raktamokshana*, *Bastikarma*, *Murdhabasti*, *Nasya*, and *Dhupana* etc [15]. According to *Acharya Vagbhata* poor hearing associated with *Sopha* and *Kleda*, should be given *Vamana therapy*[emesis] [16].

CASE HISTORY:

Presenting complaints: Hearing loss in both ears (Right > Left) since 1 year
Known Case of Post-pneumococcal meningitis

History of Presenting Illness

A 7-year-old male child, born of a non-consanguineous marriage, was apparently healthy until 15 December 2024, when he developed high-grade fever associated with earache. This was followed by intermittent headache, and later altered sensorium with disorientation, for which he was immediately hospitalized.

On evaluation, ear discharge culture revealed *Streptococcus pneumoniae* (Gram-positive diplococci), and the child was diagnosed with pneumococcal meningitis. During the course of illness, he developed complications including acute mastoiditis and cerebral venous sinus thrombosis.

In view of mastoid involvement, the patient underwent cortical mastoidectomy in December 2024,

during which purulent material was drained from the mastoid and attic regions.

Following recovery from the acute illness, the parents noticed sudden onset of hearing loss in both ears on 24/12/2024, with the right ear being more severely affected. Since then, the hearing loss has been persistent. The child is able to perceive loud sounds such as clapping, clicking, screaming, and music; however, he is unable to differentiate or comprehend speech sounds, resulting in significant impairment of verbal communication. There is no history of associated symptoms such as vomiting, vertigo, seizures, syncope, visual disturbances, or facial asymmetry.

A hearing aid was advised during prior consultation; however, the parents sought alternative management options, concerned about the impact of hearing impairment on the child's speech development and quality of life. The child was admitted in our IPD for evaluation and management of hearing loss and is currently completed 3sets of IP admissions for 21 days at 3 months interval

Past History

History of Pneumococcal meningitis
He developed complications including acute mastoiditis and cerebral venous sinus thrombosis. No history of recurrent otitis media or hearing impairment before the present illness

Birth History

Full-term child
Delivered by Lower Segment Cesarean Section (LSCS)
Birth weight: 3.62 kg
No NICU admission

No perinatal complications

Developmental History

Developmental milestones appropriate for age before illness

Post-illness: speech perception affected due to hearing loss

Past Surgical History

Cortical mastoidectomy - December 2024

Family History

No family history of hearing loss, neurological illness, or hereditary disorders

Personal history

Bowel -1 time/day

Appetite -good

Micturition- within normal limits

Sleep-sound

Dasavidha pareeksha

Dushya- Rasa, Rakta

Desha-sadarana

Bala-avara

Kalam-adana

Agni-samagni

Prakruthi-kapha

Vaya-bala

Satwa-avara

Sathmya-shadrasasathmya

Ahara-misra ahara

Samprapthi ghatakas

Dosham: Vata, Kapha

Dushya -rasa,raktha

Srotas: sabda vaha

Srotodusti: , vimarga gamana

Adhistana: sravanendriya

Roga margam-bahyam

Ashta sthana pareeksha

Nadi -Pitta Pradhan Kapha

Jivha -upaliptham

Mala- Samyak (1times a day),agrathitham

Mutra ---Samyak

Shabda- Vikruthi

Sparsha -Anushnasheeta

Druk- Prakruth

Akruti- Madhyama

THERAPEUTIC INTERVENTION:

The therapeutic intervention was given for a period of 21 days at regular interval of 3 months as shown in table-

Diagnosis : Bilateral profound sensorineural hearing loss 4.

Table 1: Diagnostic Assessment

Ear	Right	Left
Pinna and surrounding area	Normal	Normal
Tragus sign	Negative	Negative
External auditory canal	Mild wax	Mild wax
Tympanic membrane	Retracted	retracted
Cone of light	Present	Present

Table 2:Tuning fork tests

	Right	Left
Rinne's test	Negative	Negative
Weber's	No lateralisation	No lateralisation
ABC	Reduced	Reduced
Schwabach test	Reduced	Reduced

Table 3:PTA-on27/12/2024

Ear	PTA[dBHL]
Right	117
Left	>120

Table 4: Therapeutic Intervention

Medicines	Dose	Route
<i>Rajanyadi choornam</i> with honey and ghee	1 tsp twice daily after food	Internally
<i>Ashtachoornam</i> with hotwater	1 tsp twice daily before food	Internally
<i>Krimigna vati</i>	1 tablet twice daily after food	Internally
<i>Komanjadi Gulika</i>	1 tablet twice daily after food	Internally
<i>Gopi chandanadi Gulika</i>	1 tablet twice daily after food	Internally
<i>Rasna dasamoola ghritham</i>	1 tsp twice daily after	Internally

	food	
Swetha sankupushpi choornam +Ashwa gandha choornam With milk	1 tsp twice daily after food	Internally
<i>Rasnadi choornam +ksheera balam tailam</i>	<i>Thalam</i>	Locally
<i>Asana vilwadi tailam</i>	Application over head	Locally

Table 5: Procedures:

Name of procedure	Days	Medicines
<i>Thakra panam</i>	1 day	With one tsp <i>Ashtachooranam</i>
<i>Vicharana snehapanam</i>	3days	<i>Rasna dasamoola ghritham</i>
<i>Abhyanga and ushma swedam</i>	2 days	<i>Lakshadi tailam +Dhanwantaram tailam</i>
<i>Virechanam</i>	1 day	<i>Gandarva erandam 10 ml+milk+thriphala kashayam</i>
<i>Ksheera dhooma nasyam</i>	5days	<i>Rasna dasamoola ghritham</i>
<i>Yoga vasthi</i>	8 days	<i>Sneha vasthi[kalyanaka ghritham+dhanwantaram mezhupakam] Kashaya vasthi[honey,sainadavam, kalyanaka ghritham+dhanwantaram mezhupakam ,satapushpa kalkam, dasamoola kashaym,]</i>
<i>Shirovasthi</i>	7 days	<i>Ksheerabala tailam+karpasasthyadi tailam</i>
<i>Karna pooranam</i>	14 days	<i>Asana vilwadi tailam</i>

Table 6: PTA before treatment and after treatment

Date	Right ear [PTA]	Right ear	Left ear[PTA]	Left ear
27/12/2024	117dB	Profound hearing loss	>120dB	Profound hearing loss
23/08/2025	106.6dB	Profound hearing loss	76.6dB	Severe sensorineural hearing loss
20/12/2025	106.6dB	Profound hearing loss	68.3dB	Moderately Severe sensorineural hearing loss

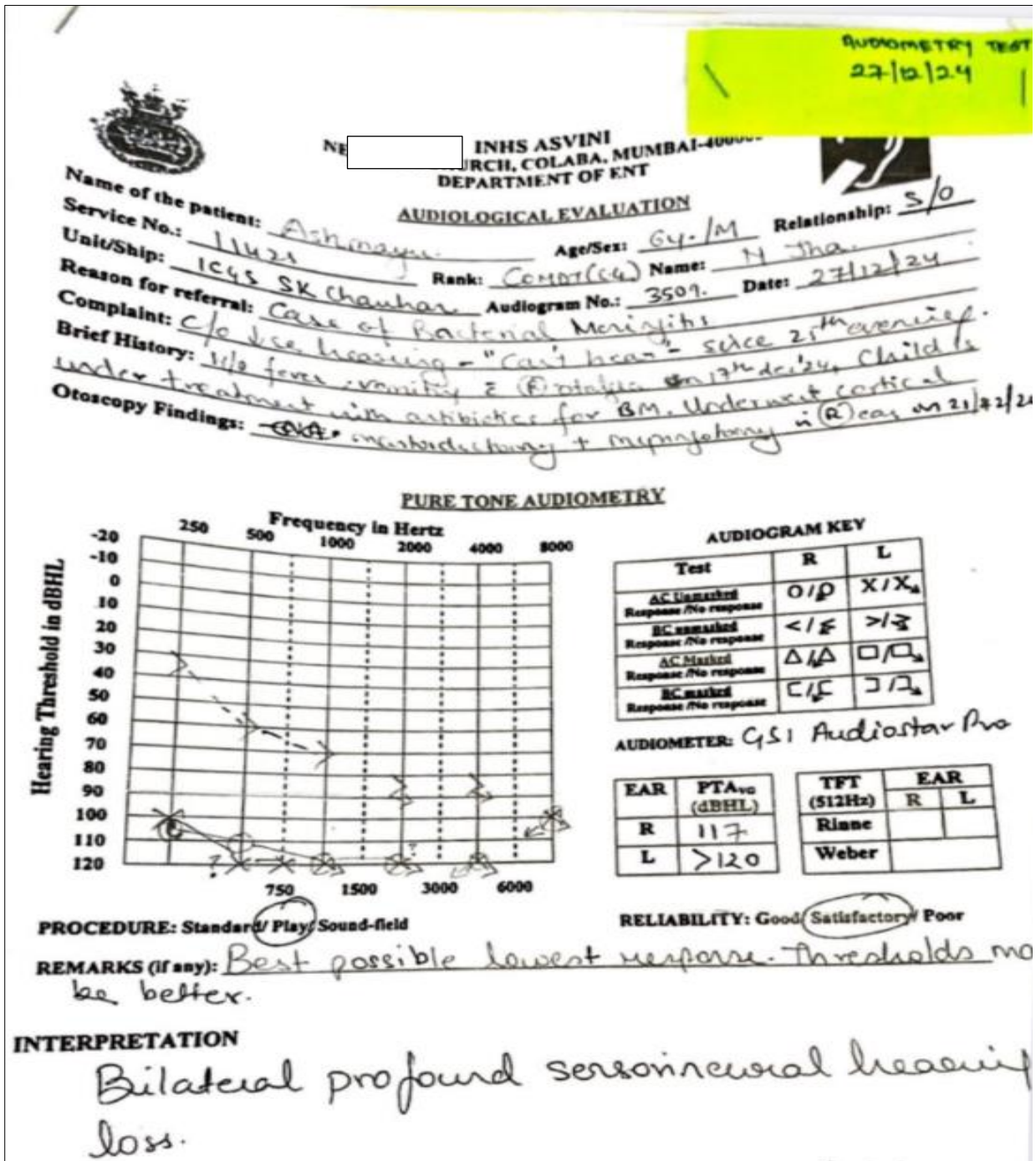


Figure-1 : PTA before treatment on 27/12/2024

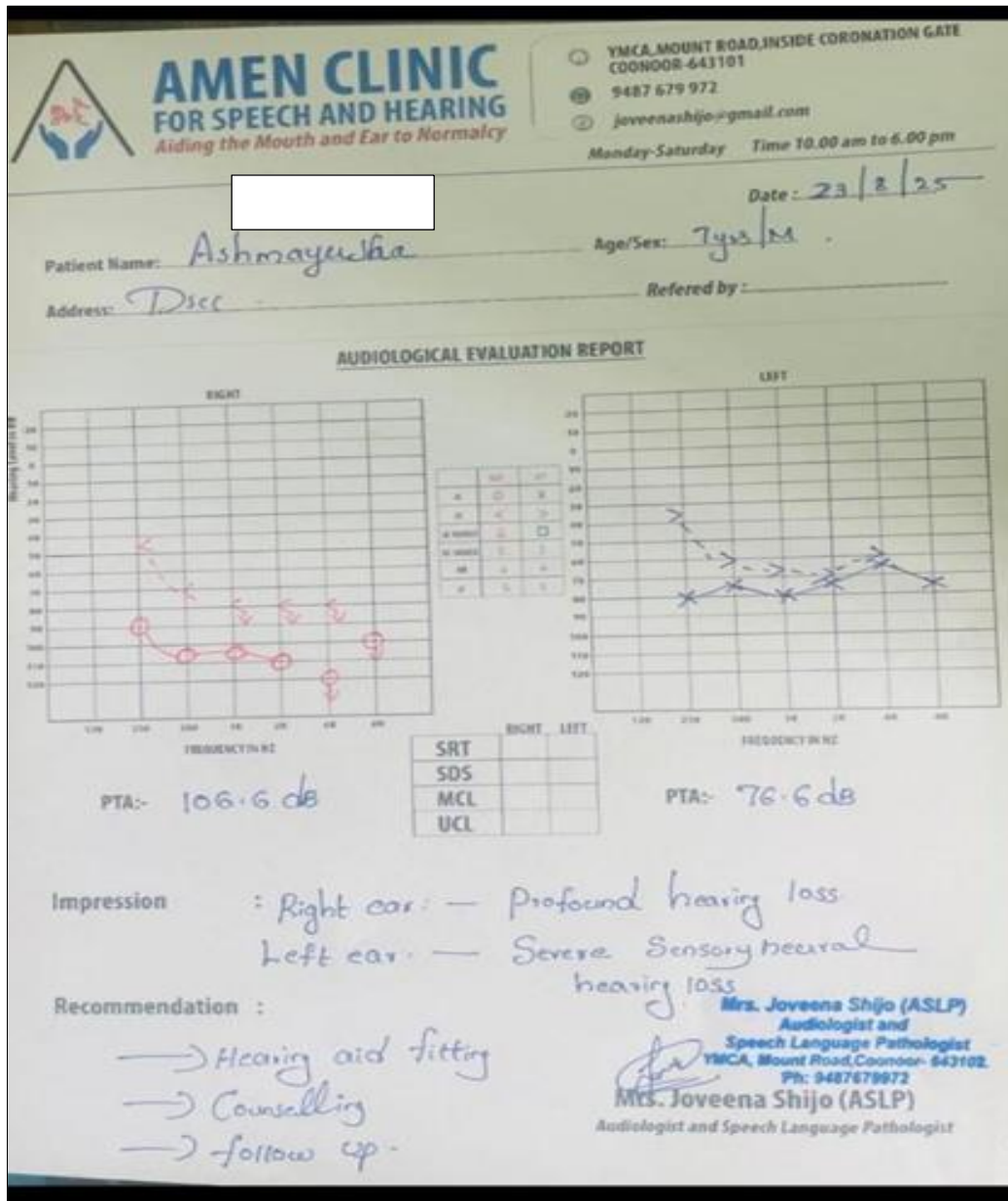


Figure-2 : PTA during treatment 23/8/2025

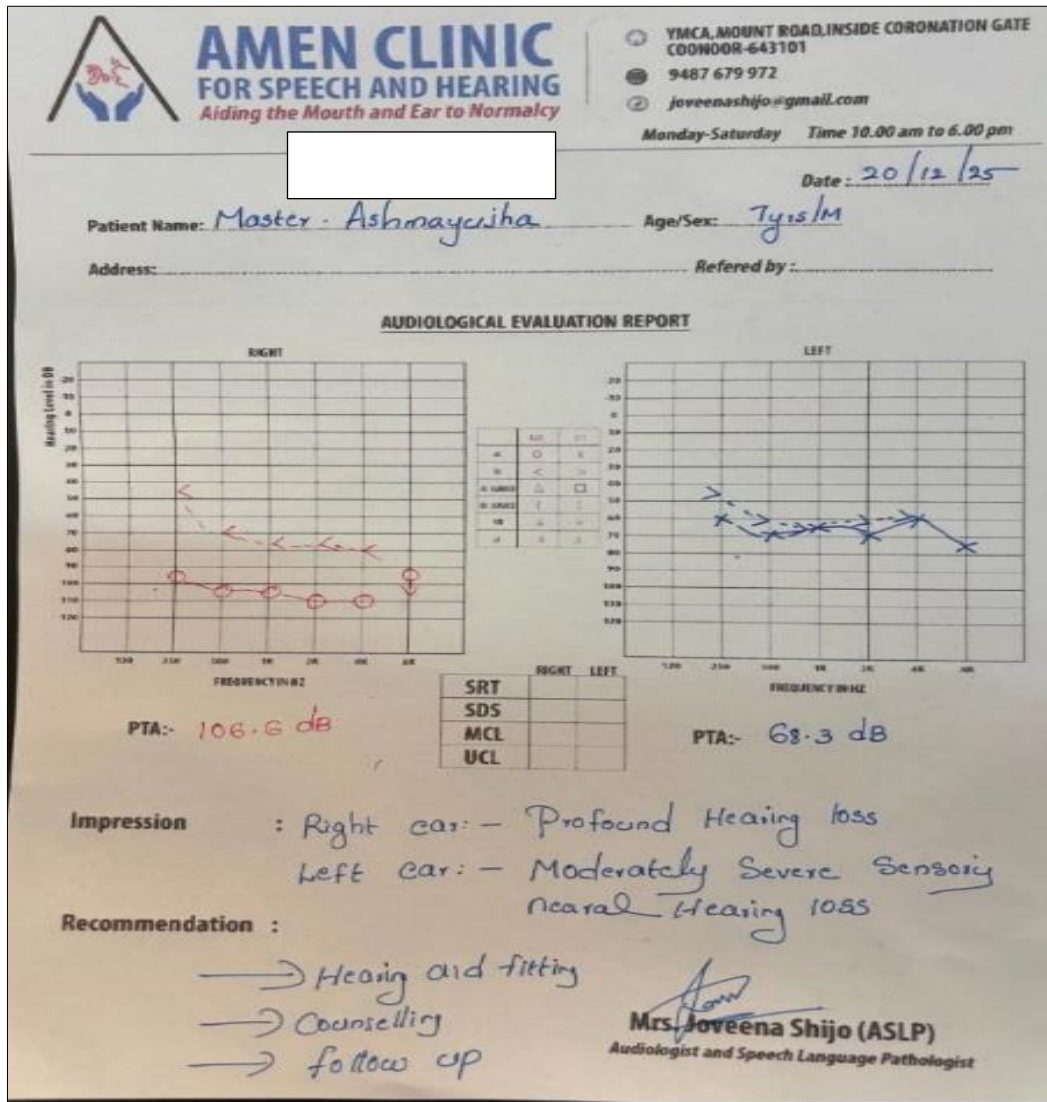


Figure-3: PTA after treatment 20/12/2025

RESULTS:

A 7-year-old male patient with Post-meningitic bilateral Sensorineural hearing loss was followed up for approximately one year. Serial pure tone audiometry (PTA) evaluations were performed during the course of treatment. The initial PTA [Figure 1] dated 27 December 2024 demonstrated profound bilateral sensorineural hearing loss, with thresholds of 117 dB in the right ear and greater than 120 dB in the left ear. They consulted and underwent first IP admission in May 2025. The patient subsequently

underwent two inpatient admissions at three-month intervals and was started on internal medical therapy, which is being continued at present. Follow-up PTA on 23 August 2025 showed persistent profound hearing loss in the right ear (106.6 dB) [Figure 2] with no significant improvement. In contrast, the left ear demonstrated marked improvement, with PTA improving to 76.6 dB, consistent with severe sensorineural hearing loss. A further PTA assessment [Figure 3] on 20 December 2025 revealed no change in the right ear, which remained at

profound hearing loss (106.6 dB). The left ear showed additional improvement, with PTA improving to 68.3 dB, indicating moderately severe sensorineural hearing loss. The patient continues on medical treatment with ongoing audiological follow-up.

DISCUSSION:

Sensorineural hearing loss (SNHL) is a well-recognized sequela of Post-meningitis, resulting from inflammation-induced damage to the cochlea, auditory nerve, or central auditory pathways. In modern medicine, the management of Post-meningitic SNHL is largely limited to hearing rehabilitation with hearing aids or cochlear implantation. However, Ayurveda offers a different therapeutic perspective by addressing both the functional impairment and the underlying pathophysiology at the level of *Dosha, Dhatu, and Srotas*. It is possible to use the "*Vata Vyadhi Chikitsa Siddhanta*" to manage *Badhirya*.^[17] In addition to these, *Ayurveda* provides a variety of treatment modalities for managing *Badhirya*, such as *Ghritapana* (consuming medicated ghee), *Rasayanasevana* (as per *dalhana mamsa rasa sevana*), *Nasya* (nasal drops), *Snehana* (oleation therapy), *Swedana* (sudation therapy), *Snehavirechana* (purgative therapy), *Sirobasti*, *Karnapoorna* (filling the ear with medicated oil)^[18]. *Badhirya* is mainly caused by *Vata and Kapha doshas*. Therefore, treatments like *Vatahara*, *Bruhaniya*, *Shodhana* have shown positive results. In this case *Ashtachoornam* mixed with [butter milk] *thakram* is given internally to

promote *agni ,ama pachana*, and *vata kapha hara* action. Most of the drugs are possess *katu lavana rasa* and *rooksha theekshna laghu guna* helps in *ama pachana , agni deepana* . *Krimigna vati* helps in deworming and providing proper absorption of drugs and nutrition to the body. It provides immunity and prevent further complications. *Rajanyadi choornam* with honey and ghee is given as immune booster .Ingredients possess *Deepana* and *pachana* properties. Childhood is inherently a *Kapha*-predominant stage of development. While this dominance is physiologically normal, it can turn unfavorable when combined with conditions such as recurrent allergies, infections like meningitis, matoiditis or other complications. Ongoing imbalance of *Kapha* in children may contribute to the development of *Shiro Abhishyanda*, which can gradually influence the health of the ears. For this reason, maintaining *Kapha* equilibrium and ensuring proper functioning of *Agni* (the body's metabolic and digestive capacity) are key strategies in both the prevention and management of pediatric ear disorders.

Furthermore, *Rajanayadi choorna*^[19] is recognized for its antioxidant and immune-supportive properties. By strengthening the body's defense mechanisms, it helps reduce susceptibility to infections, thereby minimizing the likelihood of complications that could potentially worsen hearing impairment. In addition the formulation exhibits anti oxidant and immunomodulatory activities,

playing a key role in strengthening the immune system.

Kombanchadi Gulika is formulation in *Sahasrayogam* for *vata kapha hara* action. *Gopi chandanadi Gulika* also explained in *Sahasrayogam* for *vata kapha hara*.

Rasna dasamoola ghritham explained in *Ashtanga Hridaya chikitsa sthana kasa chikitsa adhyaya*, in *vata rogas* it can be used as *pana*, *navana* and *basthi*. it is useful in *urdhwa anila rogas*. This preparation, containing *Aja Mamsa* (goat meat) along with the *Jeevaniya* group of herbs, is especially beneficial for strengthening immunity and delivering profound nourishment, particularly in children. The *Ghrita* (ghee), characterized by its *Snigdha* (unctuous and smooth) quality, supports the enhancement of *Bala* (strength). In children, it helps to improved vitality, growth, and overall development. The primary objective of administering *Snehapana* within this regimen is to regulate and optimize *Agni*, thereby promoting proper formation and sustenance of the *Dhatu*s. *Swetha sanku pushpi choornam* and *Aswa gandha choornam* having *rasayana*, *Medhya* action.

Local application of *Rasnadi choornam* and *ksheera bala tailam* as *thalam* provides *vata kapha samana*, *ushna theeksna* and *indriya prasada* action. *Asana vilwadi tailam* used in *karna rogas*, it can be used to apply over head and can be used as *karna poorana*. it is explained by *sahasrayogam taila yoga prakaranam* as *Nayana karna shiro hitham uthamam*.

Internal medications, *thalam* and *shiro abhynga* [Head massage] mainly acts on

vata hara, *kapha hara*, *brimhana*, *balya* action. Local application as *thalam* enhances absorption, acts directly on *shira marma*, and their action on hearing loss is understood mainly through *vata kapha* balance and *indriya prasada*. *Lakshadi tailam* and *dhanwantaram tailam* used for *abhyanga* [oil massage]. It is administered as *poorva karma* before *sodhana therapy*. It facilitates the dosha elimination. *Lakshadi tailam* and *Dhanwantaram tailam* strengthens muscles and joints and supports deep tissue nourishment and strengthens ear ossicles. *Mrdu virechanam* with *Gandarva erandam* and milk is done to correct *Dosha vaishmya* by eliminating vitiated *Doshas* from *Koshta*. Classical texts mention that properly administered *Virechana* [Purgation] brings about *Indriya prasada*, *Agni deepana* [Increases digestive fire], and the promotion of *Dhatu poshana*. [Nourishment to tissues] *Ksheera dhooma nasyam* with *Rasna dasamoola ghritham* provides *Dridendriya* (giving strength to sense organs) and *Ghrita* [Ghee] functions as *Yogavahi* (bioenhancers), enhancing therapeutic efficacy by facilitating absorption and delivery of the active phytochemical into deeper tissues, including the structures of the ear. *Ksheeradhooma* with *bala* [*Sida cordifolia*] also alleviates the Increased *Vata* in *Srotra*. *Shirovasti* provides *Indriya prasada* and treats diseases of *Vataja* origin. *Ksheerabala tailam*, used in this case, is known for its *Indriya prasada* and *Brimhana* action. The ingredients are *Bala*, *Tilataila*, and *Ksheera*, which are known to be

Balyam[beneficial for strength], which means they help strengthen and stabilize the middle ear structures, and *Karpasastyadi tailam*. Most of the drugs are *Vata kapha haram* and help in giving strength to nerves and muscles.

Yoga Vasti is a specialized Ayurvedic detoxification and rejuvenation therapy within *Panchakarma*, regarded as the primary treatment for balancing *Vata dosha* and treating musculoskeletal disorders. *Basti* is considered the half-treatment for all *Vata*-related disorders because it directly reaches the root of *Vata* in the colon. It involves the administration of a series of medicated oil (*Anuvasana*) and decoction (*Niruha*) enemas over 8 days[5 *anuvasana vasthi* and 3 *niruha vasthi*]. It acts by purifying the body, removing toxins, and providing deep nourishment to tissues by stabilizing *Vata*, *Basti* helps improve the overall function of the nervous system, including the auditory nerve.

Asana vilwadi thailam used as an Ayurvedic solution to relieve hearing loss, tinnitus, and earaches. *Asana vilwadi thailam* primarily used to treat disorders of the head, eyes, and ears. In the context of hearing loss, it is valued for its potential to strengthen auditory nerves and manage symptoms like tinnitus and ear aches. The oil is believed to strengthen the nerves associated with hearing, which can help sharpen the sense of hearing. Ingredients like *Asana* (*Pterocarpus marsupium*) possess anti-aging properties that may support cell and tissue regeneration in the inner ear, potentially slowing or stopping age-related hearing loss. It pacifies

aggravated *Vata* and *Kapha doshas* in the region above the neck.

CONCLUSION:

Sensorineural hearing loss following meningitis results from inflammatory damage to the cochlea, auditory nerve, or central pathways. Conventional care focuses on rehabilitation with hearing aids or cochlear implants.

In *Ayurveda*, this condition resembles *Badhirya*, involving *Vata-Kapha* vitiation affecting the *Shabda Vaha Srotas*. Management emphasizes *Vata-Kapha shamana*, *Agni deepana*, *Ama pachana*, *Rasayana*, *Indriya prasadana*, and *Dhatu poshana*.

Internal medications support metabolism, immunity, and tissue nourishment. *Panchakarma* therapies like *Virechana* and *Basti* help systemic balance, especially *Vata* regulation. Local treatments such as *Nasya*, *Shirovasti*, and *Karna Poorana* aim to strengthen auditory function.

Improvement in the left ear suggests benefit in partial cochlear damage, while profound damage in the right ear may limit recovery.

Consent of the patient:

The consent of the patient has been taken for publication of the case details and accompanying images without disclosing the identity of the patient.

Conflict of interest: The author declares that there is no conflict of interest.

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