

Functional Hearing Loss: A Few Case Reports

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Abstract

Functional hearing loss is a term used to describe hearing loss which appears greater than that can be explained on the basis of pathology of the auditory system (Martin, 1985). A review of literature suggests that a number of tests have been used to detect pseudohypoacusis. A majority of the clinicians may believe that objective tests yield more reliable information than subjective tests in detecting functional hearing loss. Though objective tests like immittance evaluation and auditory brainstem response are useful in a majority of the patients, it may not be possible to use them successfully with all the patients. Presented here are case reports of four patient's in whom functional hearing loss was suspected. The case reports highlight the variability in patients with functional hearing loss.

Introduction

Pseudohypoacusis or functional hearing loss is a term used to describe hearing loss which appears greater than that can be explained on the basis of pathology in the auditory system (Martin, 1985).

Individuals may exaggerate their hearing problem for various reasons. With the introduction of welfare measures to the hearing handicapped individuals, the number of patients with functional hearing loss has increased. We have encountered patients who feign hearing loss for the following reasons:

- to get monetary benefit i.e. to get monthly pension from the Government.
- to get compensation for hearing loss acquired after accidents.
- to apply for admission to postgraduate courses.

Individuals with functional hearing loss may have normal hearing or may show a functional overlay on an organic hearing loss. It is more difficult to identify patients with functional overlay on organic problems than those having functional loss or with normal hearing.

Case Reports

It is well known that indications to pseudohypoacusis and the tests that will help in identifying patients with functional hearing loss will vary from individual to individual. One of the indications of pseudohypoacusis is the absence of a shadow curve for air-conduction and bone-conduction signals in patients with unilateral hearing loss. An example of this is cited here.

A 60 year old patient (A) came with the complaint of unilateral hearing loss. He complained that he received a blow on the left ear which resulted in bleeding and a loss of hearing. The purpose of his visit was to obtain a report regarding his hearing problem. He had to produce this report before the court where he had filed a case of grievance against the accused.

Audiological evaluation was initiated with pure-tone testing. The audiogram showed normal hearing in the right ear and profound hearing loss in left ear (Fig. A-1). Absence of a shadow curve for air conduction thresholds indicated the possibility of pseudohypoacusis. Unmasked bone-conduction thresholds obtained by placing bone vibrator on right mastoid ranged between 60 & 70 dB HL across frequencies. Abnormal bone-conduction thresholds in the ear with normal air-conduction thresholds again suggested that the patient may be exaggerating his problem.

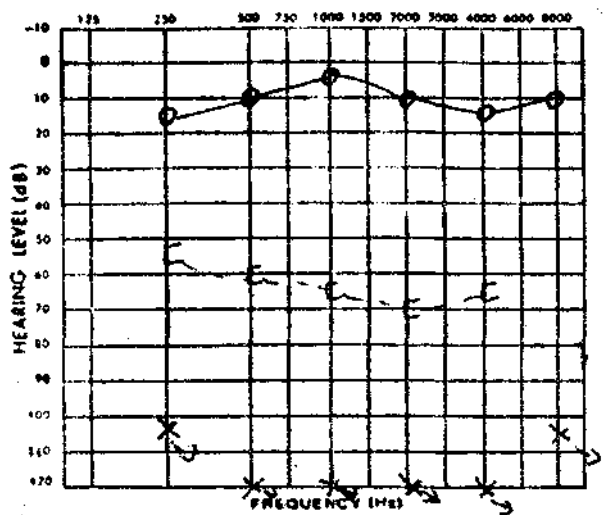


Fig. A-1, Pure-Tone Audiogram of patient 'A'

Both puretone Stenger and speech Stenger test results were positive. Contralateral interference level was around 70 dB indicating moderately severe hearing loss. Auditory brainstem responses complemented the results of the Stenger test. Repeatable wave forms were obtained in the right ear upto 40 dB nHL and in the left

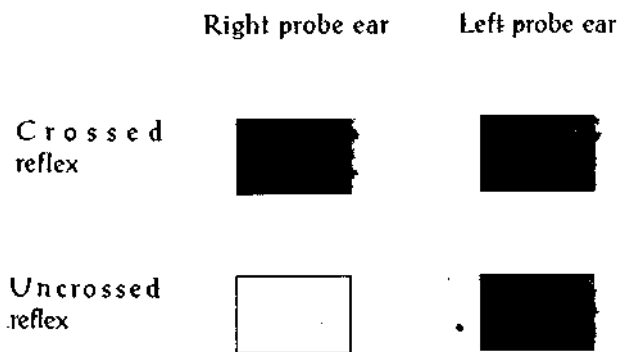


Fig. A-2 Jerger box pattern for the patient 'A'

ear upto 80 dB nHL. Immittance evaluation showed 'A' type tympanogram in the right ear and 'B' type tympanogram in the left ear. Acoustic reflex patterns showed an inverted 'L' Jerger box pattern (Fig. A-2) suggesting presence of an unilateral conductive hearing loss.

An interesting observation here was abnormal bone-conduction thresholds in the ear with normal air-conduction thresholds. This was possibly due to the Stenger effect (Left ear had conductive pathology). To test this finding, his bone-conduction thresholds were obtained again with right ear occluded. On occluding

his right ear, he responded at normal hearing levels. In this example results of the Stenger test and auditory brainstem response helped in detecting pseudohypacusis. However auditory brainstem response may not be helpful in establishing threshold in all the patients. This can be illustrated by the following example:

A 40 year old man (B) complained of hearing loss in the right ear after an accident. He required a certificate which he had to produce before the court as he was claiming compensation. He did not have any complaint regarding his left ear.

The initial audiogram showed normal hearing in the left ear and no response to puretone and speech stimuli at the maximum limits of the audiometer in the right ear. Unmasked bone-conduction thresholds were within normal limits. Again the absence of a shadow curve to the air conduction stimuli led to the suspicion of pseudohypacusis (Fig B -1).

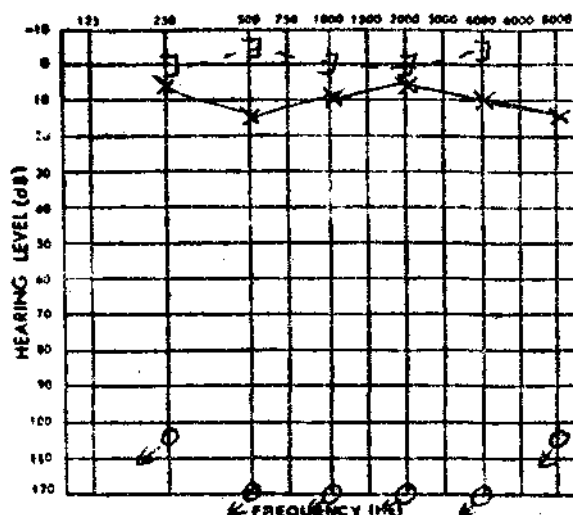


Fig. B-1, Pure-Tone Audiogram of patient 'B'

Auditory brainstem response (ABR) showed normal responses in the left ear. Wave 'V' could be identified till 20 dB n HL. When the right ear was stimulated there was no replicable waveform at 100 dB n HL suggesting the presence of a severe hearing loss or high frequency hearing loss. It has been reported that the ABR threshold correlates best with the audiometric hearing loss between 1000 Hz and 4000 Hz (Fria, 1980).

Immittance evaluation showed 'A' type tympanograms in both the ears. Acoustic reflexes were present at normal hearing levels when the left ear was stimulated. With stimuli to the right ear acoustic reflexes were present at 500 Hz & 1 KHz and absent at 2 KHz & 4 KHz. As the acoustic reflexes were present, Stenger test was

administered. Puretone Stenger test was positive. Puretone thresholds obtained using Stenger test showed high frequency hearing loss in the right ear (Fig. B -2). Again the absence of a shadow curve alerted the clinician to suspect pseudohypoacusis. However auditory brainstem response was not helpful in determining whether the functional overlay was existing or not. The above reports are examples of patients with unilateral hearing loss.

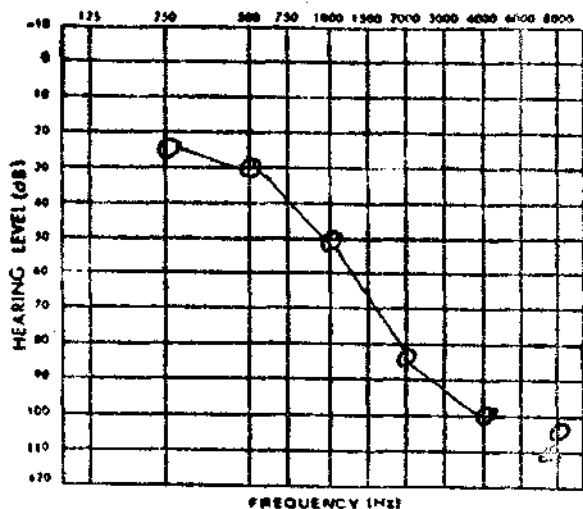


Fig. B-2, Pure-tone thresholds for Right ear obtained using 'Stenger test'

There are individuals who complain of hearing loss in both ears. Some of these patients report that they depend on lipreading for communication. The following is a report of one such patient.

A 28 year old man (C) complained of hearing loss and ear discharge in both ears. He reported that he was completely deaf and depends on lipreading for communication. The hearing loss was noticed consequent to typhoid. He had completed a Bachelor's degree in Education and requested for a certificate which would help him get employed.

The patient was first referred for otologic evaluation as he complained of ear discharge. The otologic examination revealed pus in both the ears and he was diagnosed as having chronic suppurative otitis media (CSOM) in both ears. He was advised medication and was referred for audiological evaluation to know the degree of hearing loss.

Initial audiogram showed profound hearing loss in both the ears (Fig. C-1). Unmasked bone-conduction thresholds were ranging from 40 to 50 dB across frequencies. Masked bone-conduction thresholds could not be obtained. As he had CSOM in both ears, immittance evaluation could not be carried out. His

response to pure tone stimuli was inconsistent. He seemed to follow normal conversation, with ease. He had no difficulty in repeating homophonous words like 'Appa' & 'Amma', 'Papa' & 'Mama' when spoken at normal conversational level. During speech audiometry he did not repeat spondees at maximum levels of the audiometer but would answer questions that were related to his problem.

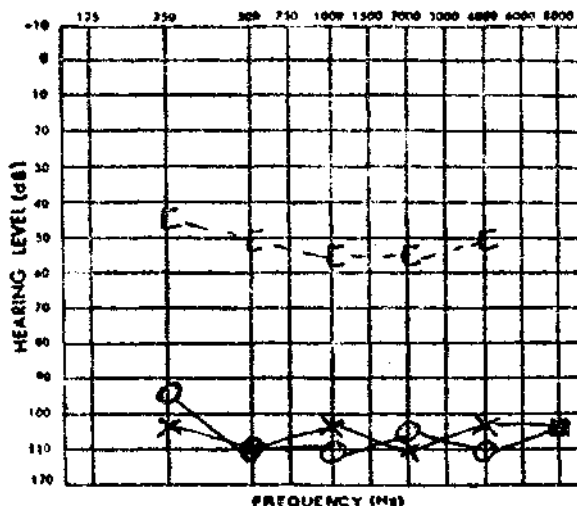


Fig. C -1 Pure-tone audiogram of patient 'C' [his admitted threshold]

To rule out pseudohypoacusis, ABR was tried. However, the testing could not be carried out as the impedance at the electrode site was not within the permissible limits for recording the ABR. Lombard test was administered by asking the patient to read a passage in Kannada and while he was reading, white noise was introduced through one of the earphones. The talk-over microphone and Vu meter was used to monitor the patient's voice level (intensity). Voice reflex was observed at 60 dB HL in the right ear and 65 dB HL in the left ear, thus indicating that the test was positive in both ears.

As the patient reported that he depended on lipreading, the 'Lipreading test in Kannada' (Subba Rao, 1981) was administered. His scores on the lipreading test are shown in Table - .

Table-1

Speech discrimination scores of patient-C for the Lipreading test.

Right ear	Intensity	Left ear
100%	70 dBHL	100%
75%	60 dBHL	85%
60%	50 dBHL	60%
20%	40 dBHL	30%

The patient was counselled and was informed that there was a discrepancy between the test results and his complaint regarding the hearing problem. The audiogram was repeated again and the results showed mild to moderate hearing loss in both ears. (Fig. C -2).

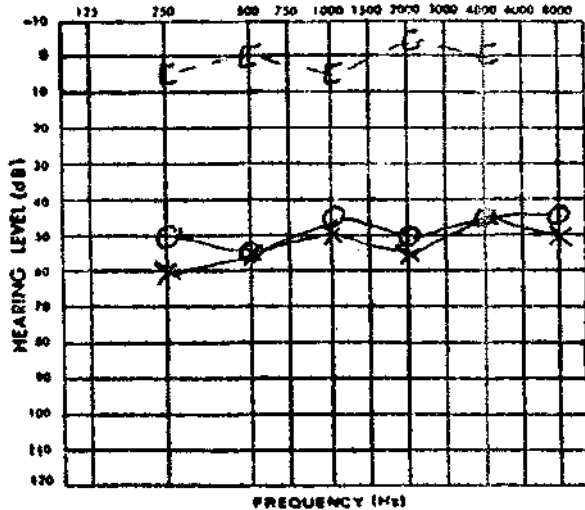


Fig. C -2. Pure-tone audiogram obtained after the patient was counselled

Here functional hearing loss was suspected as the audiogram showed profound hearing loss in both ears but the patient could follow normal conversation with ease. Also he did not show any difficulty in repeating homophonous words. Lombard test and Lipreading test helped in identifying pseudohypoacusis.

Subjective tests like the Lipreading test and the Lombard test can be tried with patients who are cooperative. However some patients report that "they cannot speak", testing such patients pose a challenge and requires skill of the audiologists. One such patient was encountered by the authors.

A 22 year old man (D) registered for a complaint of hearing loss since childhood. During speech evaluation, he would point to his mouth and say that he could not speak and hear, but was able to carry out verbal instructions without any visual clues. He wanted a physically handicapped certificate to get a monthly pension from the Government.

During the audiological evaluation his pure tone audiogram showed no response to stimuli through air-conduction and bone-conduction modes at maximum limits of the equipment. His responses were not consistent. He would sometimes reflexively raise his hand when the stimuli was presented. He seemed to be aware of the stimuli at 40-50 dB HL in both the ears. In

order to confuse him, his performance was tested with a hearing aid in 'off' position. He responded at 30-40 dB HL in a free field situation.

Immittance evaluation showed 'A' type tympanogram in both ears and acoustic reflexes were present at normal levels. ABR could not be carried out as the impedance at the electrode site was not within the permissible limits. The Lombard test and Lipreading test could not be tried as he reported that "he could not speak". Though he did not respond in the test situation, he would answer questions that were related to his hearing problem by nodding his head.

The clinical impression was that he had a "functional hearing loss". It was not possible to establish his actual thresholds.

Here functional hearing loss was suspected as acoustic reflexes were present. However no standard tests were helpful in determining his thresholds.

Discussion

In the above cases reports the indications for pseudohypoacusis that have been observed are absence of shadow curve in patients with unilateral hearing loss, absence of response to puretone stimuli at maximum level of the audiometer for all the frequencies, inconsistent responses to puretone, and over reliance on lipreading. These indications have also been reported in the literature (Martin, 1985; Chaiklin & Ventry, 1963; Jerger & Jerger, 1981; Hopkinson, 1978; Cooper, 1980). In addition to these there were other indications such as patients would follow normal conversation with ease (without visual clues) but the audiogram showed severe to profound hearing loss. During speech audiometry some patients do not repeat spondees but answer questions that are related to their problem at very low intensity.

A test battery should always be used in testing patients with functional hearing loss. The choice of the tests will depend on the individual being tested, his symptoms, his admitted thresholds and of course, the facilities available in the clinic. Though objective tests like immittance audiometry and auditory brainstem response are very useful in most of the patients, it may not be possible to use them successfully with all the patients. As reported earlier it may mislead the clinician at times. The Stenger test was found to be very useful for unilateral hearing loss patients. The Lipreading if used tactfully can predict thresholds in bilateral hearing loss patients.

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