Acute-Onset Unilateral Psychogenic Hearing Loss in Adults: Report of Six Cases and Diagnostic Pitfalls

Naoki Oishi^{a,b} Sho Kanzaki^a Chinatsu Kataoka^a Mami Tazoe^a
Yasuhiko Takei^b Keiichi Nagai^b Naoyuki Kohno^b Kaoru Ogawa^a

^aDepartment of Otolaryngology, Keio University School of Medicine, ^bDepartment of Otolaryngology, Head and Neck Surgery, Kyorin University School of Medicine, Tokyo, Japan

Key Words

Psychogenic hearing loss, unilateral • Acute onset • Adults

Abstract

We encountered 6 rare cases of acute-onset unilateral psychogenic hearing loss in adults. All were women in their 20s and 30s. Three cases had severe hearing impairment characterized by hearing loss at every frequency; 2 cases had profound hearing impairment, and 1 case had low-frequency hearing impairment. Of the 6 cases, 3 had a history of hearing loss, and 1 had a history of psychogenic visual disturbance. All 6 cases were initially diagnosed as having idiopathic sudden sensorineural hearing loss; all subsequently received steroid therapy. Three cases were not diagnosed as being psychogenic in origin until otoacoustic emissions and auditory brain responses were performed. Although the presence of distinctive clinical features (age, gender, and past history) is important for suspecting psychogenic hearing loss, objective audiological tests such as otoacoustic emissions are essential for diagnosing some cases. Compared to the existing reports of similar cases, our cases had a poorer prognosis (only 2 cases were cured).

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Introduction

Nonorganic or psychogenic hearing loss (PHL) is defined as hearing loss that cannot be explained by anatomic or physiologic abnormalities, and is differentiated from malingering and factitious disorders [1, 2]. In PHL, a discrepancy exists between the actual hearing threshold and the measured pure-tone threshold of a patient. Although experienced clinicians may easily detect PHL using conventional audiology procedures [3], more advanced audiology tests have been used to diagnose PHL, including auditory brain responses (ABRs) [4], transient-evoked otoacoustic emissions (TEOAEs) [5, 6], and distortion-product otoacoustic emissions (DPOAEs) [7]. These tests have helped clinicians to diagnose PHL more accurately than before. However, it is still rather challenging to diagnose an adult case of PHL, because PHL is very rarely encountered among adults [8, 9], except for in the military population [10]. Moreover, unilateral PHL is less frequently reported than the more common bilateral PHL [11], which in Japan occurs about 10 times more often than unilateral PHL [12]. Therefore, unilateral PHL in adults is considered to be very rare. When unilateral PHL in adults occurs suddenly, it can be very difficult to

Fig. 1. Initial audiogram of a 32-year-old woman complaining of acute-onset hearing loss. The patient's hearing loss was diagnosed later as psychogenic.

Fig. 2. DPOAE of her right ear showing normal ear function. This finding was inconsistent with the patient's audiogram (see fig. 1).

be distinguished from idiopathic sudden sensorineural hearing loss (ISSHL). Adding to this difficulty is the fact that there are very few reports that describe the clinical course of acute unilateral PHL in adults [13, 14]; thus, the characteristics of such cases remain unclear.

We encountered 6 adult cases of acute unilateral PHL in our hospitals. Here, we present these cases, along with a brief literature review. We also discuss the diagnostic pitfalls associated with unilateral PHL.

Case Reports

From 2002 to 2008, we encountered 6 adult PHL patients (all aged over 20 years) at Keio University Hospital and Kyorin University Hospital, who had experienced sudden and unilateral hearing loss. We reviewed the charts of each patient and examined them for the following clinical data: age, gender distribution, days from onset prior to the first hospital visit, degree and type of hearing impairment, past history, psychological findings, and prognosis.

Representative Case Report

A 32-year-old woman came to the emergency department at Keio University Hospital because of sudden hearing loss in her right ear. She had experienced tinnitus the day before. She also had aural fullness and hyperacusis. Pure-tone threshold testing revealed right-side sensorineural hearing loss (fig. 1). These signs

and symptoms led us to diagnose her with ISSHL. Thus, we started giving her daily steroid injections.

The patient's hearing threshold worsened day by day, and on the third day of steroid injections, her right-side hearing levels diminished profoundly. A speech recognition hearing test performed on the third day produced a score of 5% (at 100 dB), which was consistent with the pure-tone hearing test results. On the fourth day, we performed otoacoustic emission (OAE; DPOAEs and TEOAEs) and ABR tests, all routine tests for ISSHL. Contrary to our expectations, the test results showed that the patient had normal hearing function in her right ear (fig. 2). We stopped the steroid injections and consulted a psychotherapist.

Psychotherapy revealed that the patient was very anxious due to her stressful job as an elementary school teacher. The stress was thought to be the main cause of her PHL. She quit her job, which freed her from stress, and regained normal hearing levels within 6 months.

Features of the Six Cases

The details of all 6 cases are described in table 1. The mean age of the patients was 29 years (ranging from 21 to 39 years). All were women. Three of the patients visited a hospital within 2 days of onset, while the other 3 waited more than 7 days after onset before first visiting a hospital. The degree and type of the initial hearing loss was profound at about 100 dB HL in 2 cases, severe at 70 dB HL (with flat-type audiogram) in 3 cases, and moderate at 50 dB HL (with impairments at low frequencies) in 1 case.

Three cases had a history of hearing loss that had recovered, and 1 case was under psychiatric therapy for obsessive-compulsive disorder. All of the cases at first received steroid injections in

Table 1. Clinical features of 6 acute-onset PHL cases

Case No.	Gender	Age years	Lesion site	Days of treatment after onset	Hearing loss dB HL	Type of audiogram	Past history
1	female	21	right	1	60	flat	psychogenic visual disturbances
2	female	21	left	2	65	flat	–
3	female	24	right	7	106	profound	hearing loss
4	female	32	right	1	66	flat	hearing loss
5	female	37	right	7	50	low-frequency impaired	–
6	female	39	left	36	110	profound	hearing loss

Table 2. Psychological findings, stressors, treatment and prognosis of 6 acute-onset PHL cases

Case No.	Psychological findings	Stressor of PHL	Treatment	Prognosis
1	being treated for predisposing OCD	anxiety due to change in medication	continuing psychiatric therapy for predisposing OCD	no improvement
2	neuroticism and very high anxiety, tendency for alexithymia	family trouble	psychological counseling	fluctuations
3	–	family trouble	only observation (refused psychological counseling)	no improvement
4	high anxiety	much stress and frustration from work (teacher)	only observation (quit her job)	cured
5	very aggressive, perfectionism, tendency for alexithymia	sexual harassment, stalking	psychological counseling	cured
6	mild depression, high anxiety	stalking	drop out within 1 month	no improvement

OCD = Obsessive-compulsive disorder.

line with their initial diagnosis of ISSHL. However, we suspected that 3 of the cases may be psychogenic: in 1 case, hearing in the contralateral ear started to worsen and the ability to communicate improved more than would be expected on the basis of the patient's audiogram; in the second case, the patient spoke on a telephone, placing the receiver on the affected ear, and in the third case, the patient had obsessive-compulsive disorder and had a history of psychogenic visual disturbances. The 3 remaining cases presented with a disease course similar to that of ISSHL, even before OAE and ABR tests were performed to determine whether their hearing loss was indeed functional.

Of the 6 patients, 4 received a psychogenic assessment by psychotherapists. The assessment revealed that all 4 patients had predisposing psychogenic factors and were subjected to stressors predisposing them to PHL (table 2). The patient with obsessive-compulsive disorder and the patient who refused the psychological consult did not receive psychogenic assessment.

Two cases received a favorable prognosis of 'curable', whereas 4 cases received a poor prognosis of 'no improvement'.

Discussion

In the present report, we describe very rare cases of acute-onset unilateral PHL in adults. Many terms besides PHL have been used in the literature to describe the discrepancy between the actual hearing threshold and the measured pure-tone threshold in the absence of organic diseases: nonorganic hearing loss, pseudohypacusis, conversion deafness, and functional hearing loss [8, 15]. PHL is categorized as a conversion disorder by the American Psychiatric Association [16], and is differentiated from malingering and factitious disorders [1, 2].

PHL usually occurs bilaterally [9] and mostly in children [8, 12]. Acute-onset PHL is very rare, with only 2.5% of sudden hearing loss cases being psychogenic [17]. These reports indicate that the cases reported here are

very rarely encountered; thus, it is important to clearly document the features of these cases.

All of our cases were initially diagnosed as having ISSHL and all initially received steroid therapy. We initially diagnosed these patients with ISSHL for two reasons: (1) the ability of patients with unilateral hearing loss to communicate rarely decreases; (2) there was no discrepancy between the patients' ability to converse and measured hearing levels. Because all cases presented with ISSHL-like symptoms on their first hospital visit, unnecessary steroid therapy could not be avoided initially.

ABRs, TEOAEs, and DPOAEs are very helpful and reliable for diagnosing PHL [4–7]. In 3 of our 6 cases, ABR and OAE results provided the first evidence that these cases might have PHL rather than ISSHL. As shown in the representative case we described above, some PHL cases resemble ISSHL in terms of clinical symptoms and are thus difficult to distinguish from ISSHL solely on the basis of conventional hearing tests. ABR is a standard test used to verify the behavioral thresholds in nonorganic hearing loss [18]. However, using ABR as an initial diagnostic test and performing it on every patient with suspected PHL is time-consuming. On the other hand, OAEs are easy to perform and are time-saving. Therefore, OAEs can be very valuable tests for distinguishing PHL from ISSHL. They can be used routinely to assess ISSHL patients on the first consultation, with the aim of avoiding unnecessary steroid use. It should also be emphasized that the positive response of OAEs alone in a patient with poor audiometric hearing levels is not sufficient to diagnose PHL, because a patient with vestibular schwannoma [19] or auditory neuropathy [20] can be involved. Thus, ABR should be performed to diagnose PHL in a patient with poor audiometric results and positive OAEs.

Other conventional audiometric tests such as acoustic reflex have been used in the detection of PHL [15]. The acoustic reflex obtained by patients presenting with profound hearing loss can raise the possibility of PHL. However, it is difficult to detect PHL based on acoustic reflex thresholds, unless reflexes are elicited at sensation levels of 10 dB or lower, according to the patient's alleged pure-tone thresholds [15]. By contrast, TEOAEs are absent in ears with hearing losses >35 dB HL at 1 kHz, and DPOAEs are absent in ears with hearing losses >40–60 dB HL at 1–4 kHz [21]. These reports suggest that, although the acoustic reflex is useful for some PHL patients, OAEs are more sensitive to detect PHL than acoustic reflex.

There are many distinct epidemiological differences between the PHL of our cases and ISSHL. Our PHL patients were in their 20s and 30s, while many ISSHL patients are in their 50s and 60s [22]. All of our PHL cases were women, which is consistent with the finding that conversion disorder occurs 2–10 times more frequently in women than in men [16]. By contrast, ISSHL occurs at about the same frequency in women and men [23]. Five of our 6 cases presented with severe or profound hearing loss characterized by flat-type audiograms. However, patients with ISSHL can present with different types of hearing loss, and only about 50% of these patients have hearing loss characterized by flat-type audiograms [19]. Half of our PHL patients first sought hospital treatment more than 7 days after onset, whereas nearly 80% of ISSHL patients typically seek hospital treatment within a week after onset [22]. This suggests that, unlike ISSHL patients, PHL patients may not be fully aware of the severity of their hearing impairment despite the presence of severe or profound hearing loss.

Another remarkable feature of PHL patients is that most have a history of hearing loss. In ISSHL, hearing loss usually occurs once in a patient's life [24]. However, 50% of our PHL patients had experienced previous hearing loss. Taken together, the presence of these features is important in suspecting PHL in patients that present with unilateral hearing loss at their first consultation.

Most of the cases in our study had predisposing psychological or psychiatric conditions, and all were subjected to stressors related to the onset of PHL. Most cases of conversion disorders usually have a good prognosis within 2 weeks of onset [16], and most reported cases of acute-onset conversion deafness are cured [13, 17]. However, in our cases, only 2 out of 6 cases were cured, with 1 case taking 6 months and the other taking as long as 1 year to be cured. Another case experienced fluctuations in PHL for years despite proper psychological assessment and therapy. The other 3 cases did not recover at all: one did not want psychological assessment and underwent surveillance for more than a year; another case, who received psychiatric therapy for obsessive-compulsive disorder, did not recover, even after more than 6 months of visiting our hospital; the remaining case left follow-up within a month of visiting our hospital even though her residual profound hearing loss persisted. Although past case reports described good prognoses for acute-onset PHL cases [8, 13, 17], our cases indicate that some adult acute-onset PHL cases could have poor prognoses and thus should be observed carefully.

Conclusions

We encountered 6 rare cases of acute-onset unilateral PHL in adults. When an adult patient presents with sudden unilateral hearing loss, if the patient is a young female, has severe or profound hearing loss characterized by a flat-type audiogram, and has a history of hearing loss, then the patient should be considered to be a candidate for PHL. Because some cases of PHL cannot be distinguished from ISSHL solely on the basis of clinical in-

formation and conventional audiologic procedures, we recommend using OAE and ABR tests, two tests that are useful for diagnosing PHL accurately. OAEs especially are thought to be valuable diagnostic tools to use on a patient's first hospital consultation. The prognosis for acute-onset unilateral PHL in adults can be poor; thus, patients presenting with the signs, symptoms, and epidemiological characteristics described in the present report should be observed carefully.

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