

## KABAKULAĞA BAĞLI İŞİTME KAYBI: VAKA SUNUMU VE DERLEME<sup>1</sup>

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### ÖZET

Çocukluk çağındaki işitme kayıpları konuşma, lisan öğrenme, zekâ gelişimi, okul başarısı gibi önemli konularda olumsuz etkiye sahiptir. Bu derlemeyle; 12 yıllık izlemi olan, kabakulağa bağlı unilateral işitme kaybı yaşayan bir vakadan yola çıkarak kabakulağa bağlı işitme kaybının literatürdeki yerini belirleyip, ileride yapılacak çalışmalara katkı sağlamayı hedefledik. 20 yaşındaki erkek hasta, 8 yaşında iken soğuk havada dışarıya çıktıktan 2 gün sonra aniden duymamaya başladığını, şikâyetlerine ateş ve ağrının eşlik ettiğini belirtmiştir. Tedavi için geç kalındığı söylenen hasta kabakulağa bağlı unilateral işitme kaybı teşhisi ile hayatına devam etmiştir. Literatür taramaları ile konumuzla ilgili çalışmaları değerlendirdik. Kabakulakta klinik olarak en sık %60-70 parotit, %25 epididimo-orşit, %1-10 ensefalit ve %4 geçici yüksek frekans işitme kaybı görülmektedir. Literatüre göre unilateral kalıcı işitme kaybı 1/20.000 vakada görülmektedir. Yalnızca çocuklarda değil yetişkinlerde de kabakulak virüsünün tama yakın işitme kaybına ve ciddi komplikasyonlara yol açabileceği rapor edilmiştir. İşitme kaybına ve kabakulak şüphesine erken müdahalenin önemi hakkında aile bilgilendirmeleri yapılmalı, aşılamanın önemi vurgulanmalıdır. Kabakulağa bağlı işitme kayıpları çeşitlilik gösterdiği için vaka çalışmalarının değerlendirilmesinin faydalı olacağını düşünmekteyiz.

#### Anahtar Kelimeler

- Kabakulak
- İşitme kaybı
- Kulak
- Anatomi
- Parotis bezi

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## HEARING LOSS DUE TO THE MUMPS: CASE REPORT AND REVIEW

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### ABSTRACT

Childhood hearing loss has a profoundly negative impact on speaking, language learning, intellectual development, and school achievement. In this review of a 12-year follow-up case with unilateral hearing loss due to mumps, we aimed to contribute to further studies by determining the role of mumps-associated hearing loss in the literature. A 20-year-old male patient had a sudden onset of hearing loss with fever and pain after 2 days of going out in cold weather when he was 8. The patient, who was said to be late for treatment, continued her life with the diagnosis of unilateral hearing loss due to mumps. We evaluated the literature and studies related to our topic. The most common clinical findings in mumps are parotitis (60-70%), epididymo-orchitis (25%), encephalitis (1-10%), and transient high-frequency hearing loss (4%). Unilateral permanent hearing loss occurs in 1 / 20,000 cases according to the literature review. It has been reported that the mumps virus may lead to almost complete hearing loss and serious complications not only in children but also in adults. Parents should be informed about hearing loss and suspicion of mumps and the priority of vaccination should be emphasized. Since mumps-associated hearing loss may be variable, the evaluation of case reports would be beneficial.

#### Keywords

- Mumps
- Hearing loss
- Ear
- Anatomy
- Parotid gland

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## INTRODUCTION

Mumps is an acute, infectious, and common disease. Paramyxovirus is accepted as the main virus causing mumps (1). Although it is common in children at primary school age and adolescents, there are also cases where it is seen in adults (2). One of the most obvious clinical manifestations of mumps is swelling of the parotid gland (3). Parotid gland, which is the largest salivary gland of the body, is located in the front and bottom of the external auditory canal, on the side of the face. Its canal, parotid duct, opens to vestibulum oris at the upper second molar tooth level. Acute viral infection of the salivary glands causes temporary xerostomia (4). The ear, which is the hearing and balance organ of the body, is examined in three sections as the outer ear, the middle ear, and the inner ear. The inner ear consists of the bone labyrinth and membrane labyrinth. The organ of corti, which is a part of the membranous labyrinth, converts mechanical sound stimuli into impulses, and the organ of corti, which receives these impulses, cochlear nucleus, colliculus inferior through the cochlear nerve, and then temporal lobe, where the hearing cortex is located (5).

The causes of hearing loss identified so far can be classified as autoimmune, infectious, metabolic, neurological, traumatic, and vascular. However, the etiology of sudden hearing loss is unknown in many patients. These patients are classified as idiopathic, and numerous hypotheses are argued in this context. The most common among these are circulatory failures, rupture of the cochlear membrane, and viral infections (6). Unilateral hearing loss is that the hearing threshold is normal ( $\leq 15$  dB) in one ear, and 20 dB and above in the other ear (7). Unilateral hearing loss may be innate or may be due to environmental factors based on different causes. The most common among the postnatally acquired causes is the sensorineural hearing loss caused by neurotropic viruses (CMV, paramyxovirus) (8). Unilateral hearing loss is a clinical condition, which is neglected continuously today. It was reported that unilateral hearing loss during childhood causes difficulty in determining the localization of sounds and understanding speech in noisy environments (9). Behavioral problems like delay in speech and language learning, weakness, and attention deficits in school success, concentration impairment, irritability, and timidity can be seen in such children. Although hearing loss may be identified at earlier ages with hearing screening programs today, there is no definitive evidence-based approach in the treatment (10). Hearing loss is the most common sensory disorder, and the prevalence in our country is 0.17% according to the National Neonatal Hearing Screening Program data. In school-age children, on the other hand, unilateral hearing loss increases because of acquired causes and prevalence increases up to 3-5% (11). Sudden sensorineural hearing loss is seen in 1/20.000 cases in adults. Although it is rarer in the pediatric population, the prevalence is not known (12). Mumps-related hearing loss cannot be treated and results in cognitive and social negative consequences (10). Today, the only known method for the protection of mumps is vaccination (13).

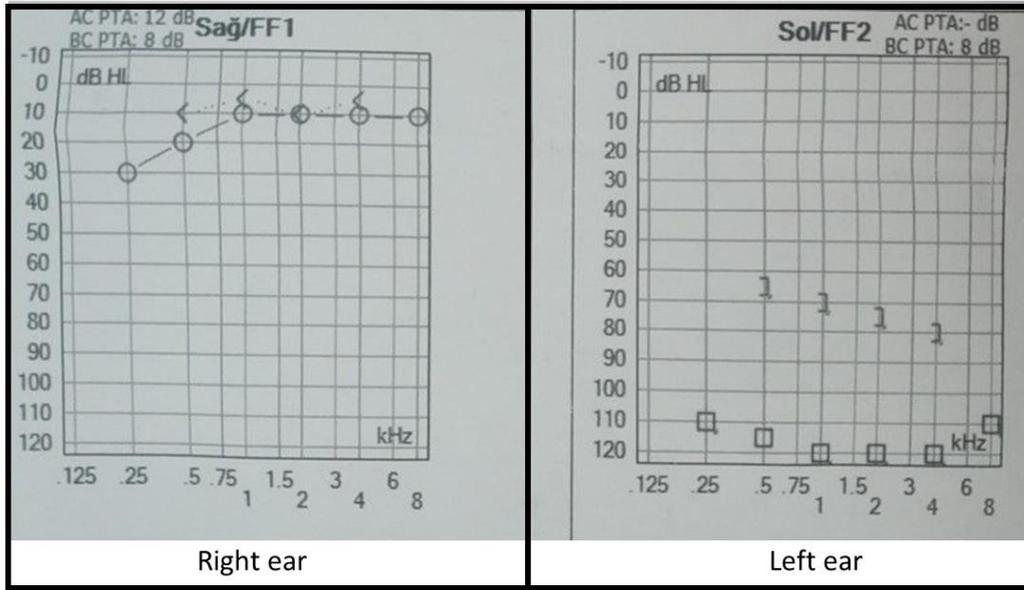
The present review of ours was conducted to draw attention to this issue on anti-vaccination discourses, which have recently become widespread. With this review, our purpose was to determine the place of mumps-related hearing loss in the literature, to raise awareness for this rare condition, and to contribute to future studies based on a case with a 12-year follow-up due to mumps-related unilateral hearing loss.

## THE CASE

The patient who is the subject of this study is a 20-year-old medical student, and he was not vaccinated against mumps in childhood. At the age of 8, 2 days after going outside in the cold, he suddenly stopped hearing anything. Afterward, complaints of pain and fever were accompanied.

When the patient and his family applied to the university hospital due to complaints and hearing loss, a diagnosis of mumps infection was made. It was stated that unilateral hearing loss was due to mumps infection. The patient was hospitalized for a while for anticoagulant, vasodilator, and anti-inflammatory

drug treatment; however, there was no improvement. According to the audiogram of the patient, although the hearing threshold in the right ear is elevated at low frequencies, his hearing seems normal. In the left ear; however, he could not even hear the sound of a jet plane, whose hearing threshold corresponds to 120 dB (Fig.1).



**Figure 1.** Audiogram results of the patient.

From the first diagnosis of hearing loss to the present, the patient applied to university and training and research hospitals again; but there was no change in hearing loss in the left ear. The patient continues his life with unilateral hearing loss.

## DISCUSSION

Mumps is a common childhood infection that is caused by a paramyxovirus. The most obvious clinical symptom is the swelling of the parotid gland (13). Although mumps progresses calmly, it is one of the diseases that must be considered in the vaccination program because of its complications like hearing loss and infertility (2). Although unilateral hearing loss that stems from various reasons is diagnosed early with hearing screening programs today, there is no evidence-based method for its treatment (10). The pathogenesis of mumps-related hearing loss has not yet been fully elucidated. One of the most likely hypotheses of the pathogenesis of hearing loss is the endolymphatic labyrinthitis, caused by the virus, and spread through the hematogenous route after the primary invasion (3). It is hypothesized that not identifying the pathogenesis completely, drug transition being low in the endolymphatic labyrinthitis, which is the most likely hypothesis, the transition of drugs becoming nearly impossible with inflammation, therefore the treatment is inadequate, and the lack of a treatment or method not being developed yet are influential in the failure of the treatment (2).

According to our literature review, most studies conducted on mumps-related hearing loss were conducted in Japan. We believe that this is the result of mumps being an endemic disease in Japan. Mixed vaccination became a routine practice in Japan in 1989; however, when the aseptic meningitis cases increased after vaccination, it was banned in 1993. Single mumps vaccination was started as of 1999. Mumps cases were reported to increase again between 2000 and 2001 (Table 1). Also, the type of hearing loss and recovery status after mumps-related hearing loss were reported with certain cases in

Japan (14, 15, 16, 17, 18) (Table 2). In these cases, it was reported that the patients did not have mumps vaccines and that the majority of hearing loss was bilateral. All patients started to use cochlear implantation after mumps-related hearing loss, and no spontaneous healing was detected (Table 2). Although mumps progresses calmly, it is one of the diseases that must be considered in vaccination programs because of complications like hearing loss and infertility (2).

In Turkey, the mumps vaccine was added to the national vaccination calendar in 2006 under the name of MMR (Measles-Mumps-Rubella). Vaccine doses are applied in the 12th month and the primary school 1st grade. Vaccination campaigns are organized for adults who were not vaccinated when they were children (19). No studies were detected in the literature about mumps-related hearing loss in Turkey except for 2 case reports (2,20). One of these cases was a 4-year-old girl who was not vaccinated against mumps and who had bilateral hearing loss after mumps reported by Unal et al. (20). The other one was reported by Gedik et al. as a 28-year-old male patient who was not vaccinated against mumps, which is a very rare case. Bilateral hearing loss occurred after mumps in this case. This case showed that the mumps virus can lead to nearly full hearing loss and serious complications not only in children but also in adults (2). It was reported that there were no improvements in both cases.

In the world, mumps-related hearing loss has almost disappeared in developed countries with high vaccine protection. The Measles-Mumps-Rubella vaccine was introduced in 1967 in the United States and has been routinely administered since 1977. A second dose was recommended in 1989 (21). The first dose is administered between 12 and 15 months, and the second dose is administered between the ages of 4 and 6 before the child starts school. For adults over the age of 18, at least one dose is also recommended. It is not recommended for those who are born before 1957 because they are assumed to carry natural mumps immunity (22).

Mumps vaccine is routinely administered in the form of mixed vaccination in 16 European countries (23). The first dose is administered between 11 and 14 months, the second dose is administered between 15 and 23 months (24). We did not find any studies conducted on mumps-related hearing loss in the United States and European Countries. We believe that the introduction of the vaccine in a routine manner many years ago at an early age might have effects on the rare prevalence of the disease in these countries.

## RESULTS AND CONCLUSION

As a result, it is considered that pre-contact immunization against mumps infection, which brings serious clinical problems like hearing loss and sterility, can contribute to the solution of these social and psychological problems. Families must be informed about the importance of early intervention in hearing loss and mumps suspicion, and the importance of vaccination must also be emphasized. We believe that it would be useful to evaluate the case studies because mumps-related hearing loss shows variations.

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