

## Case Report

### A Case of Chronic Otitis Media Surgery in an AIDS Patient

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#### Abstract

The number of human immunodeficiency virus (HIV)-infected patients requiring surgery is increasing. Unlike other types of surgery, few reports have described ear surgery in HIV-positive patients. Because the number of HIV patients requiring ear surgery is expected to increase, it is important to determine the correct course of treatment and optimal surgical methods, as well as to determine risks in these patients. This report describes a 56-year-old HIV-positive patient who underwent surgery for chronic otitis media.

**Keywords:** HIV; COM; Mastoidectomy; Infection

#### Introduction

Since its first description in 1983, the number of patients infected with the human immunodeficiency virus (HIV) has increased worldwide, with cases reported from virtually every country. The World Health Organization (WHO) estimated that, at the end of 2015, 36.7 million people worldwide were living with HIV. Including the 2 million people who started receiving treatment in 2015, 17 million were confirmed as receiving antiretroviral therapy, including seven of 10 pregnant women with HIV. An estimated 0.8% of adults aged 15-49 years are living with HIV worldwide [1].

HIV belongs to the family of human retroviruses (Retroviridae) and the subfamily of lentiviruses. The spectrum of manifestations has become well defined. Up to 84% of infected individuals show symptoms that may present to otolaryngologists. Identification of acute HIV infection is important for early administration of antiretroviral drugs, as early chemotherapy may reduce the initial decline in CD4 lymphocyte count, possibly increasing disease-free interval and life expectancy [2]. Few reports to date, however, have described ear surgery in HIV-positive patients. One study, of HIV-infected children in Brazil, found that 10.5% had acute otitis media (AOM) and 12.4% had chronic otitis media (COM). COM is rare in adults, especially in those who are HIV positive. This report describes an HIV-positive patient who underwent surgery for COM.

#### Case report

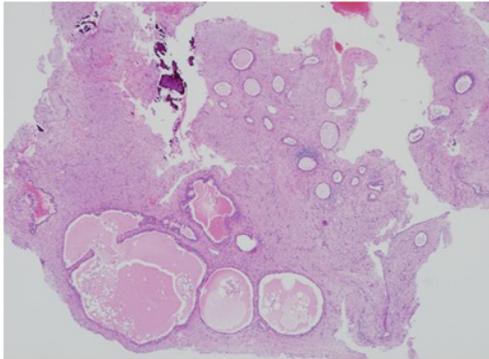
A 56-year-old man visited our institution due to a hearing disturbance in both ears. One year earlier, he had experienced symptoms of otorrhea for about two days. Hearing disturbance in his right and left ears started six and three months, respectively, before presentation. History taking by the outpatient department (OPD) showed that he had been taking medications for diabetes mellitus and panic disorder.

#### AB



**Figure 1:** Endoscopic findings of the (A) right and (B) left tympanic membrane.

He had previously experienced nasal symptoms, including nasal congestion and a runny nose, and had been diagnosed with left maxillary sinusitis. The patient claimed that he had been well until one month before admission, at which time he developed an intermittent stabbing headache. Physical examination of both ears under endoscopy showed a central large perforation of his right tympanic membrane (TM) and a small perforation at the antero-inferior quadrant of his left TM, along with a retraction at the postero-superior quadrant of the latter (Fig. 1). Both sides appeared flat on impedance audiometry.



**Figure 4:** Right middle ear cavity granulation tissue biopsy, showing inflammation and fibrosis.

Pure-tone audiometry of his right ear showed air conduction of 50 dB and bone conduction of 26 dB ear, whereas pure-tone audiometry of his left ear showed air conduction of 48 dB and bone conduction of 19 dB. Computed tomography showed soft tissue density in the middle ear cavity, mastoid antrum, and mastoid air cells on both sides of the temporal bone of both ears. The patient was preliminarily diagnosed with COM on both sides and was indicated for right intact canal wall mastoidectomy with tympanoplasty.

Preoperative laboratory tests showed that this patient was positive for antibody to HIV, had a high HIV RNA titer and low CD4 and CD8 cell counts (Table 1). The results were communicated to the patient, who was aware of these findings but had stopped anti-HIV treatment himself.

Date	2016.05.10	2016.02.23	2016.01.29
HIV-RNA titer (copies/ml)	<20	203	29539
T Cell (CD3) (56.0~86.0%)	73	79	76
T helper (CD4) (33.0~58.0%)	17	17	11
T suppressor (CD8) (13.0~39.0%)	55	61	65

**Table 1:** Changes in laboratory data after the patient started anti-retroviral treatment.

Because his HIV-RNA titer was high, he was started on highly active antiretroviral therapy (HAART), consisting of 1 tablet/day Stribild, a combination of elvitegravir, cobicistat, tenofovir disoproxil fumarate, and emtricitabine, prior to ear surgery. After taking the drugs for 3 months, his HIV-RNA titer decreased markedly.

For infection control, equipment such as microscopes and nerve monitors were protected using disposable surgical drapes. The surgeon and assistants wore protective clothing and were educated about taking appropriate precautions. The patient underwent right intact canal wall mastoidectomy with right tympanoplasty type I. All disposables and needles were disposed according to the appropriate protocols. There were no post-operative complications, except for mild OP site pain.

Two days after the surgery, the patient was discharged without any problems. A biopsy of the middle ear mucosa showed inflammation and fibrosis, but HIV-PCR of this tissue showed no evidence of HIV-RNA. Pure tone audiometry 4 weeks later showed air conduction of 27 dB and bone conduction of 12 dB in his right ear and air conduction of 60 dB and bone conduction of 35 dB in his left ear.

## Discussion

This case raises several concerns. The patient failed to inform medical personnel that he was HIV-positive and was not currently receiving treatment for it. Routine pre-operative laboratory tests showed that his HIV RNA titer was high. Had the operation been performed without protection, the medical staff would have been exposed to secondary infection. Beginning in 1998, specialty care institutions for HIV-positive patients were abolished in Korea, allowing patients to receive care without discrimination at all medical institutions throughout the country. There are no consequences to patients for not telling medical staff about their HIV infection status. However, medical staff members are at risks of infection. Despite the importance of patient confidentiality, medical staff performing invasive treatments must be provided with information about each patient's infection status. A study performed in 2007 found that, in treating HIV-infected patients, three nurses and one doctor had become infected through needle-stick transmission in hospitals [3], demonstrating that blind exposure of medical staff can result in HIV infection.

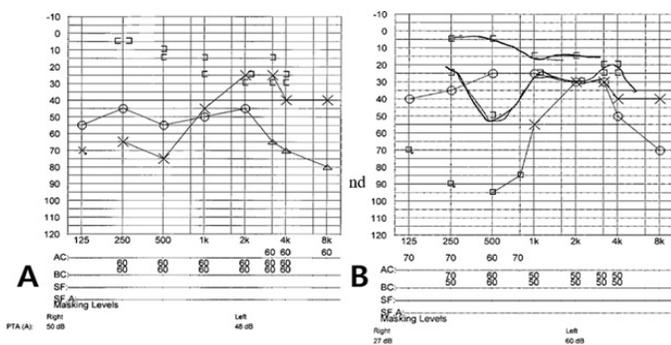
Our patient was unaware of the severity of his disease and his wife was unaware that he was infected. Patient confidentiality should therefore be breached if a third party is at risk. According to Korean law, infected persons, their spouses (including common-law spouses) and all sexual contacts should be notified of matters necessary to prevent the propagation of HIV. Many asymptomatic patients refuse treatment. Optimizing treatment and long-term survival outcomes of adults living with HIV requires understanding decision-making in the pre-HAART period [4]. The timing of surgery should be based on the severity of HIV infection, as estimated by HIV-RNA titer.

Increased serum HIV-RNA levels have been found to increase the risk of transmitting HIV [5]. If surgery is not urgent, it would be wise to postpone it until the patient's HIV RNA titer is under control. Assigning an admission room is another problem encountered when HIV patients must be hospitalized. Except for patients who are highly contagious, the Department of Health and Human Services refuses to assign an isolation room for HIV-positive patients. Moreover, after surgery, these patients lose blood and body fluids through the site of operation and other wounds, possibly exposing the environment of the recovery room to HIV.

Decisions are therefore needed about the facilities provided to HIV-positive patients, especially those who undergo surgery.

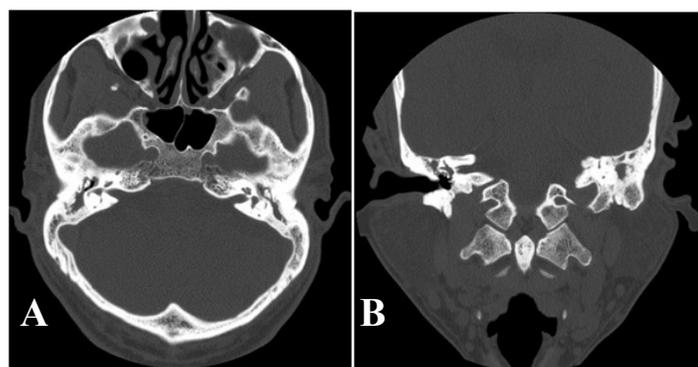
It is important to prevent infection during invasive procedures on HIV-positive patients. The risk of infection through percutaneous needle-stick injury has been reported to be 23 per 10,000 exposures, and the risk of exposure of the eye, nose, or mouth to HIV-infected blood has been estimated at 0.1%, whereas the risk of exposure by spitting or throwing bodily fluids is negligible. [6, 7] Thus, the cornea must be protected from exposure to infected bodily fluids, and it is necessary to prevent the transmission of infection from equipment exposed to patient bodily fluids. In operating on our patient, the surgeon and assistant wore protective goggles, two sets of gloves with two different colors, allowing any damage to the gloves to be instantaneously detected (Fig. 2). Precautions regarding the strict handling of bodily fluids and sharp instruments were instituted before, during and after surgery, as were appropriate isolation procedures.

Head and neck related diseases in HIV patients occur more frequently in intraoral and pharyngeal regions [9]. These diseases include candidiasis, herpes simplex, varicella zoster, hairy leukoplakia, recurrent aphthous ulcerations, xerostomia, and Kaposi's sarcoma (KS) [10]. Otolological manifestations of HIV include seborrheic dermatitis of the external ear, otitis externa with otomycosis, secretory otitis media, COM, sensory neural hearing loss, and vertigo [11]. Otitis externa is caused by *Pseudomonas aeruginosa*, whereas otomycosis is often caused by *Candida albicans*. Unlike other viral pathogens, HIV has no effects on cochlear end organs. Secretory otitis media due to nasopharyngeal lymphoid hyperplasia is common in HIV-positive patients, except in those with other malignant conditions of the nasopharynx such as KS. Although AOM has been observed in patients with end-stage HIV, there is no evidence that their immunodeficient state makes these patients more prone to developing AOM and its complications. Furthermore, there is no clinical evidence suggesting that COM, with or without cholesteatoma, is more prevalent in HIV-positive than -negative patients [12]. Biopsy specimens of the temporal bone region of seven HIV patients showed hypocellularity of the spiral ligament of the cochlea in one patient and striavascularis in another. Despite endosteal membrane elevation from the utricle, its definitive presence could not be confirmed, because the utricle could not be biopsied. Many HIV-infected patients are also superinfected with other viruses, such as cytomegalovirus and toxoplasma virus, making it unclear whether elevation of the endosteal membrane is a specific pathological consequence of HIV infection.



**Figure 2:** Pure tone audiometry in our patient (A) before and (B) after surgery.

Histopathological features of chronic inflammatory reaction and surrounding of marrow cells by plasma cells, multiple foamy histiocytes and necrotic exudates have been found at the petrous apex in patients with COM. However, these histopathologic findings were more likely due to COM itself than to HIV infection. To date, there is no definitive method for diagnosing COM in HIV patients and no specific pathological features. Furthermore, no significant differences have been observed between COM patients with and without HIV infection [13]. Similarly, despite HIV PCR tests, bacterial culture and biopsy of otitis media tissues, only inflammation and fibrosis were observed in this patient.



**Figure 3:** Axial (A) and coronal (B) non-contrast temporal bone CT images revealing fluid collection in the mastoid cavity.

Otolological manifestations have been observed in 80% of HIV-infected patients (Williams et al, 1987). In our series of 968 patients, 20% had otological manifestations, as shown by culture sensitivity of aural discharges and mastoid x-rays. Patients with these manifestations should be treated with appropriate broad-spectrum antibiotics, with mastoid exploration indicated for unresponsive patients [14]. Otolologic procedures are essential to these HIV-positive patients. Avoiding surgery or treatment because the patient is HIV-positive is both unethical and irresponsible. Because post-operative results may be related to patient level of immunity, providing stricter and more complicated treatments may

be essential, especially in patients with low CD4 cell counts or severe ear diseases [15]. Additional studies are required to determine the extent of compromised immunity. Because CD4 counts are commonly used, elective otologic procedures may be performed if CD4 counts are below a certain level as long as the procedure does not enhance patient risk. If a patient is severely immunocompromised, only mandatory surgery should be performed, in combination with intensive pharmacologic management and enhanced nutrition care.

## Conclusion

As the number of HIV-positive patients increases, otolaryngologists may more frequently participate in their treatment and/or surgery. HIV patients require intensive medical treatments, with surgery requiring the proper use of surgical instruments and the wearing of appropriate protective clothing. Furthermore, cautious post-operative care is required. As in all HIV patients, an accurate evaluation of the advantages and disadvantages of surgery is key. Knowledge of the patient's immune status should allow the surgeon to better inform the patient regarding the risks and benefits of surgery in relation to his/her underlying medical condition.

## Conflicts of interest

The authors have no conflicts of interest to report.

## Financial Disclosure Information

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