Journal on Surgery
www.journalonsurgery.org

*Case Report*

ISSN: 2691-7785

*Open Access, Volume 3*

# Nasopharyngeal Occupation as a Symptom of Fungal Otitis Media: A Case Report

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**Abstract**

**Background:** The symptoms of fungal otitis media are ear discharge,pain, itching, blocking and decreased hearing. There have been no reported cases of nasopharyngeal occupation as a symptom of fungal otitis media.

**Methods:** Case report.

**Results:** A 87 year-old male presented with progressive left head ache without blood in the snot, blurred vision, nausea, vomiting, neck mass, limb numbness, and movement disorders. Imaging demonstrated the pharyngeal recess disappeared and bulged out, which showed a typical image of nasopharyngeal cancer and considered to attribution of nasopharyngeal space occupying lesions. A nasopharyngeal biopsy was performed after local anesthesia with video-naso-pharynogo-laryngoscopes, and the result indicated inflammatory changes, and repeated test showed the same. Purulent secretion from the external auditory canal was collected and cultured, the patient was considered probably to be infected by yeast. Antifungal treatment was performed with Voriconazole for 30 days. After the first day of treatment, the headache disappeared. CT examination of temporal bones showed that the nasopharyngeal space occupying disappeared after antifungal treatment 30 days. Recurrence wasn't seen in the follow a year.

**Conclusion:** A nasopharyngeal occupation usually results from nasopharyngeal carcinoma and nasopharyngeal benign tumors. To our knowledge, this is the first reported case of nasopharyngeal occupation as a symptom of fungal otitis media.

***Keywords:*** Nasopharyngeal occupation; Nasopharyngeal carcinoma; Fungal; Otitis media; Headache.

**Manuscript Information:** *Received: Oct 03, 2023; Accepted: Nov 06, 2023; Published: Nov 13, 2023*

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**Citation:** *Huang J, Feng-bo Y, Da-zhong Y. Nasopharyngeal Occupation as a Symptom of Fungal Otitis Media: A Case Report. J Surgery. 2023; 3(2): 1129.*

## Introduction

Fungal otitis media (FOM) refers to a type of otitis media in which fungi are cultured in the contents of mastoid cavity in the middle ear. It is often complicated with chronic suppurative otitis media. It is reported that the incidence of FOM is as high as 48.9% [1]. FOM is often manifested as earache, itching, and purulent ear discharge [2]. We describe a novel case of nasopharyngeal space occupying,but it turned out to be FOM.

## Case report

A 87-year-old male patient was initially presented to hospital with a 30-year history of otopyorrhea that aggravated with earache in his left ear for 1 week. An examination revealed that his left external auditory canal swelled and ached with more purulent secretion. Computed tomography (CT) of the temporal bone indicated that mastoid air cells, tympanic antrum and tympanum were filled with the typical appearance of soft tissue mass, while the examination demonstrated no shadow 6 months ago. The initial diagnosis was: 1. Left chronic tympanitis during acute exacerbation with acute otitis externa; 2. right chronic tympanitis. Antibiotic therapy was performed with Cefoperazone Sodium and Sulbactam Sodium for two weeks. Then the swelling and aching external auditory canal was eased, and the purulent secretion significantly decreased. Two months later, the patient had a headache on the left side. The headache was expressed in persistent pain. There was no blood in the snot, blurred vision, nausea, vomiting, neck mass, limb numbness, and movement disorders. Anodyne was administered to relieve headache, then the patient went to hospital again after a week. The patient's past medical history is hypertension treated to be normal and without history of diabetes, coronary heart disease, or history of head injury. No obvious abnormal changes was demonstrated in general examination. Otolaryngology examination revealed that bilateral external auditory canals didn't swell, and there was a little bit purulent secretion in the left side. Large perforation of right tympanic membrane tension, no secretion in drum chamber. There are 2 medium sized perforations in the left tympanic tensions arranged back and forth, with a few white purulent secretions in the tympanic cavity. There is no pain, pressured the mastoid and the head. Auxiliary examination: on CT, scattered shadow existed in the mastoid, tympanic antrum, and tympanic cavity, which reduced significantly compared with the results 2 months ago, but the pharyngeal recess disappeared and bulged out, which showed a typical image of nasopharyngeal cancer and considered to attribution of nasopharyngeal space occupying lesions. It was postulated to be malignant tumors (Figure 1). Skull base detected by Magnetic Resonance Imaging (MRI) was demonstrated in Figure 2. The initial diagnosis: 1. Left nasopharyngeal space occupying lesions with undefined nature; 2. Bilateral chronic otitis media. Purulent secretion from the external auditory canal was collected and cultured, the patient was considered probably to be infected by yeast. A nasopharyngeal biopsy was performed after local anesthesia with video-naso-pharynogo-laryngoscopes, and the result indicated inflammatory changes, and repeated test showed the same. The patient was discharged on Cephalosporin for 1 week, but the headache wasn't eased. Subsequently, the patient went to the department of otolaryngology and head surgery at the West China Medical School of Sichuan University. Considering the possibility of nasopharyngeal cancer, a nasopharyngeal biopsy was also performed. Inflammatory changes were confirmed in two times of test. Bilateral external auditory canals didn't swell, and there was a little bit purulent secretion in the left side, large perforation of tympanic membrane in the right side, and no cancer cells in secretion of the tympanum. Amoxicillin was administered for 10 days for antibiotic therapy, but headache wasn't relieved. The positron emission tomography and computed tomography (PET/CT) suggested the presence of inflammation. Purulent secretion from the external auditory canal was collected and cultured again, the patient was still considered probably to be infected by yeast. It was assumed to be otitis media infected by epiphyte complicated with osteomyelitis in temporal bones. Antifungal treatment was performed with Voriconazole for 30 days. After the first day of treatment, the headache disappeared. Headaches didn't occur any more, and the subsequent secretion of left external auditory canal were collected for culture in the course of use and after the medication respectively, neither bacteria nor fungi were found. About one week after the end of antifungal treatment, the secretions in the left external auditory canal completely disappeared. Endoscopic examination of bilateral tympanic cavity showed no secretion, granulation tissue and polyps. Video-naso-pharynogo-laryngoscope revealed that the nasopharyngeal space occupying vanished, and the pharyngeal recess didn't bulge out. CT examination of temporal bones (Figure 3) and skull base detected by MRI (Figure 4) examinations showed that the nasopharyngeal space occupying disappeared. Recurrence wasn't seen in the follow a year.

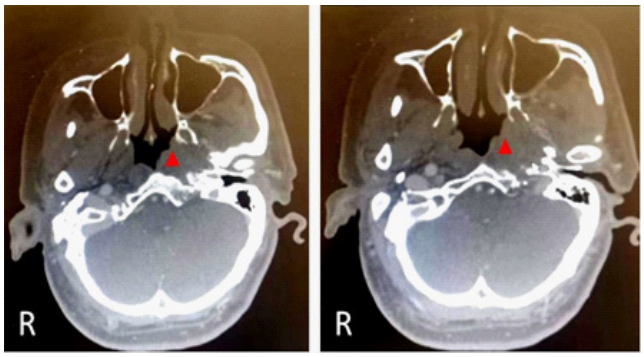


**Figure 1:** Representative coronal sections of a pre-antifungal treatment CT nasopharynx with contrast demonstrating the pharyngeal recess disappeared and bulged out (red triangle Δ).

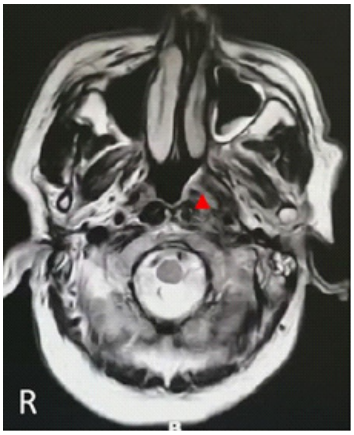


**Figure 2:** Representative coronal sections of a pre-antifungal treatment MRI nasopharynx with contrast demonstrating the pharyngeal recess disappeared and bulged out (red triangle Δ).

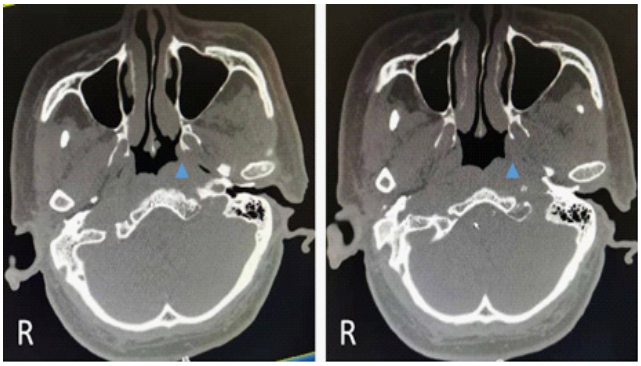


**Figure 3:** Representative coronal sections of a post antifungal treatment CT nasopharynx with contrast demonstrating the nasopharyngeal space occupying disappeared (bule triangle Δ).

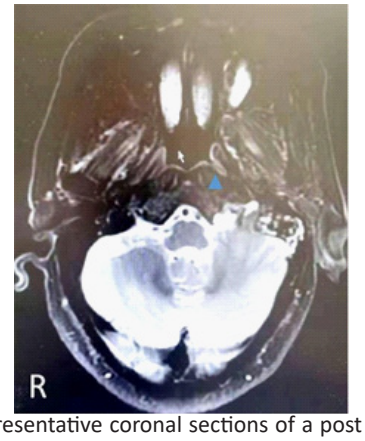


**Figure 4:** Representative coronal sections of a post antifungal treatment MRI nasopharynx with contrast demonstrating the nasopharyngeal space occupying disappeared (bule triangle Δ).

## Discussion

**Fungal otitis media:** Fungal otitis media (FOM) refers to a type of otitis media in which fungi are cultured in the contents of mastoid cavity in the middle ear. It is often complicated with chronic suppurative otitis media. It is reported that the incidence of FOM is as high as 48.9% [1]. The etiology of FOM may include application of antibiotics and glucocorticoid to chronic suppurative otitis media, which inhibits sensitive microbes, and then insensitive microbes, such as fungi, take the opportunity to proliferate, which is also called double infection [3-5]. Repeated recurrence of chronic otitis media resulting in sebaceous gland injury so that secretion acidity decreases, which lessens the inhibitory effect on fungi. Dampness of the external auditory canal is conducive to fungi growth. Patients' unhealthy lifestyles such as swabing ears with unclean items. Lower resistance, and impaired local immunity caused by increase of age, diabetes mellitus, and glucocorticoid administration [6].

Clinical manifestations of FOM are repeated recurrence of ear effusion, external ear eczema, complicated with itching and otalgia, tinnitus, and hearing loss of various degrees [1]. In recent years, with the rising of patients with diabetes, hematologic diseases, radiotherapy or chemotherapy, and the widespread administration of glucocorticoids, abuse of broad-spectrum antibiotics, the administration of immunosuppressants, and stuff like that have resulted in an increasing incidence in fungal otitis media. Main examination of FOM concludes laboratory identification of the fungus served as gold standard. Commonly used examinations are fungus microscope examination, fungal culture, histopathological methods, and fungal DNA detected [7,8]. These tests could aid the diagnosis of fungal diseases. Other tests could be video-otic-endoscope which facilitate to see hyphae and plaque in the ear canal, tympanic membrane and middle ear cavity whose tympanic membrane is perforated. FOM has similar manifestations with suppurative otitis media on temporal bone CT and ear MRI. At present, there may be no reports about specific image findings for fungal otitis media. Because the clinical manifestations of FOM are similar to those of suppurative otitis media, it is difficult to make a definite diagnosis based on clinical manifestations and physical signs alone, and it is more likely to cause misdiagnosis. However, if otorrhea occurs with protracted course, multiple treatments and long-term administration of multiple antibiotics are ineffective, or patients have underlying diseases such as diabetes, it should be predicted that FOM occurs, and it should be applied that microscopic examination of fugus, fungal culture and histopathological examination [9].

**The experience and lessons of this case:** Having a review of this case: the patient had a long history of chronic otitis media, the initial diagnosis was chronic tympanitis during acute exacerbation with acute otitis externa, and then the condition improved after antibiotic treatment, but two months later, non-specific symptoms of non-chronic suppurative otitis media occurred such as headaches and neoplasm in nasopharynx. Additionally, it was considered to be the nasopharyngeal space occupying, not excluding nasopharyngeal cancer because of the high similarity of its image findings with nasopharyngeal cancer and the patient's high-risk factors [10]. However, inflammatory changes were inspected by four pathological biopsies of two 3A grade hospital and PET/CT examination, and positive fungal culture results were obtained twice. The final diagnosis was fungal otitis media, and antifungal therapy was effective, and the long-term follow-up showed good prognosis.

### Why did this patient develop fungal otitis media?

Etiology could be that chronic otitis media caused the alterations of acidic environment of the middle ear and the external auditory canal, and reduced its resistance to fungi, antibiotics were administered by intravenous drip at hospital for two weeks and sequentially applied by ear drop for more than one month, which leading to the inhibition of bacteria and the proliferation of fungi in the middle ear and temporal bone so that double infection occurred, and the 87-year-old patient had impaired resistance although he did not have basic diseases such as diabetes.

### Why wasn't fungal otitis media early diagnosed?

Reasons could be the antibiotic therapy was initially effective, the main symptoms at the second visit to hospital are headache without typical manifestations of FOM such as itching, tinnitus, earache, and external ear canal eczema, examination indicated nasopharyngeal space occupation, similarity to nasopharyngeal cancer, patient's dwelling in high prevalence area of nasopharyngeal cancer, and the patient's belonging to high-risk group, and there are numerous fungi in the nature so that it weakened the testimonial power of a single positive fungal culture result.

**Why did patients have headache and nasopharyngeal space occupying?**

This is how headache and nasopharyngeal space occupying is developed: long-term chronic otitis media caused middle ear mucosal injury and fungal infection occurred after repeated antibiotic treatment. Subsequently, the temporal bone osteomyelitis occurred due to the severe fungal infection, resulting in headache, swelling of the peripheral soft tissue of the temporal bone, and lymphoid reactive hyperplasia in pharyngeal recess near the petrous apex, which demonstrated nasopharyngeal recess bulging out on CT, the typical images of nasopharyngeal carcinoma, causing misdiagnosis probably.

## Conclusions

Chronic suppurative otitis media is a common and prevalent disease in the otolaryngology. If repeated antibiotic treatment is performed and resistance is impaired, fungal otitis media would develop, severe fungal otitis media would cause temporal bone osteomyelitis, and then the temporal bone osteomyelitis would cause swelling of the peripheral soft tissue of the temporal bone and lymphoid reactive hyperplasia in pharyngeal recess near the petrous apex, which manifests as bulging pharyngeal recess in nasopharynx, especially similar to the nasopharyngeal carcinoma from endometrium on image. Patients could have headaches for this disease, which is resembling the symptoms of nasopharyngeal cancer. In clinical practice, it is easy to be misdiagnosed as nasopharyngeal cancer, and then repeated nasopharynx biopsies would be performed, which would induce patient's suffering without definite diagnosis. Under this situation, fungal culture of secretion in the middle ear should be done, and patient should be diagnosed as fungal otitis media on the basis of the findings of PET/CT examination. However, temporal osteomyelitis caused by fungal otitis media is rare and arduous to diagnose early. Since temporal osteomyelitis is deep infection, potent antifungal agents are required based on drug sensitivity assay. The therapeutic regimen is administering voriconazole for 1 month. Consequently, the advice to strengthen supervision of the antibiotics treatment of senile patients with chronic otitis media should be proposed. Multiple culture of secretion should be performed to detect alterations in pathogens early.

## Declarations

**Conflicts of interest:** None. The patient agreed with the publication of the case and provided informed consent for it.

**Disclosure:** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Author contributions:** Conceptualization: Da-zhong Y. Data curation: Jing Huang, Da-zhong Y, Feng-bo Y. Resources: Jing Huang, Feng-jiao L. Supervision: Feng-bo Y. Writing: Jing Huang, Feng-bo Y.

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