

# Atypical fungal maxillar sinusitis - case report

## Grzybicze zapalenie zatoki szczękowej nietypowym przebiegu – opis przypadku

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### ABSTRACT:

Fungal sinusitis can be divided into invasive and non-invasive. Fungal ball of the sinus is a type of chronic non-invasive infection and it is most often related to the previous endodontic treatment. This case report describes non-invasive fungal rhinosinusitis in a patient with cough and obstructive sleep apnea syndrome. The patient did not present any other symptoms and he was treated by a therapeutic specialist. The patient underwent antibiotic therapy but no improvement was observed. Computed tomography of the face showed the lesion with calcification of the right maxillary sinus. It was decided to perform sinusotomy through the anterior wall of the maxillary sinus under endoscopic control. The lesion was removed during surgery and the sinus was rinsed. General condition of the patient improved after surgery. No cough or obstructive sleep apnea syndrome was found.

### KEYWORDS:

grzybniak, zatoki, grzybicze zapalenie zatok, aspergillus

### STRESZCZENIE:

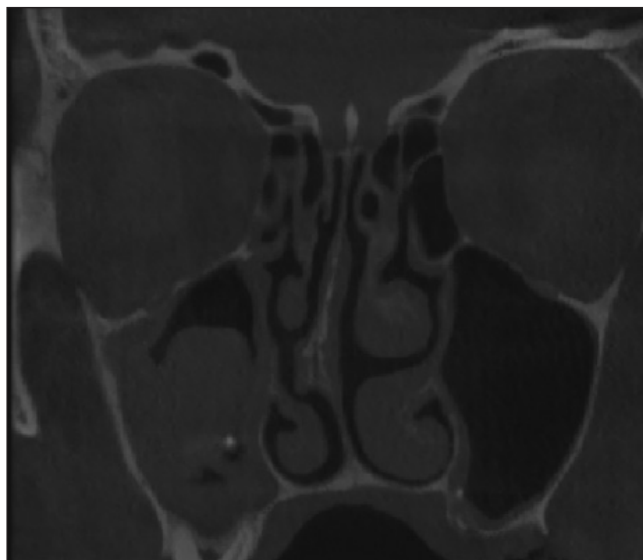
Infekcje grzybicze zatok przynosowych można podzielić na postać inwazyjną i nieinwazyjną. Grzybniak zatok to rodzaj przewlekłego nieinwazyjnego zakażenia. Najczęściej związany jest z przebyłym leczeniem endodontycznym. Opis przypadku dotyczy nieinwazyjnego grzybiczego zapalenia zatok przynosowych u pacjenta z kaszlem i zespołem bezdechu sennego. U pacjenta nie występowały inne objawy. Podczas leczenia zastosowano antybiotykoterapię, lecz nie zaobserwowano poprawy. Tomografia komputerowa twarzy wykazała zmianę ze zwapnieniami w zatoce szczękowej prawej. Podjęto decyzję o wykonaniu sinusotomii przez przednią ścianę zatoki szczękowej pod kontrolą endoskopową. W trakcie zabiegu usunięto zmianę oraz wypłukano zatokę. Stan ogólny pacjenta uległ poprawie po zabiegu operacyjnym. Ustąpił kaszel i objawy bezdechu sennego.

**SŁOWA KLUCZOWE:** mnogi przyzwojak, nerw twarzowy, guz na szyi, szumy uszne

## INTRODUCTION

Fungal rhinosinusitis is characterized by the prevalence of two basic forms - invasive and noninvasive. The noninvasive form most often concerns patients with immune disorders and may pose a threat to the patient's life due to development of intracranial complications. Mycetoma, also known as micetome, as well as allergic fungal sinusitis is classified as noninvasive. Mycetoma is one of the most common forms of inflammation and comprises an agglomeration of *Aspergillus* mycelial species. In most cases, it develops unilaterally with an odontogenic basis (1,2). In 1885, Schubert was the first to describe fungal rhino-tracheitis and sinusitis. It was a case of a female patient aged 75

with basic reported symptoms such as total lack of possibility to breathe through the nose and generous nasal discharge. The process was located in both nasal cavities and the right maxillary sinus. Pathological infiltration taken from the nasal cavity appeared to be a solid, dark brown tissue. The pathogen which caused the disease was *Aspergillus fumigatus*. The second case with a similar clinical course was described in 1889 by Siebenmann. The author observed a fungal infection of the left nasal cavity and left maxillary sinus with destruction of the side nasal wall. The patient reported hindered breathing through the nose, generous, fetid discharge from the left nasal cavity and intensified headaches. Two pathogens were identified simultaneously - *Aspergillus fumigatus* and *Aspergillus nidulans*.



**Fig 1.** CT of paranasal sinuses. Fungus ball in right maxillary sinus.

Aggressive progression of disease led to the patient's death.

In the recent years, there is an upward trend of fungal sinusitis. Loidolt et al. (3) observed, that around 10% of all patients operated due to chronic sinusitis suffered from fungal infection. Diagnostics of fungal sinusitis is repeatedly slowed because its clinical picture does not differ significantly from the clinical picture of bacterial inflammations. Basic clinical symptoms include headaches, nasal breathing disorder, chronic cough, fetid atrophic rhinitis.

## CASE REPORT

A 45-year-old female patient diagnosed with chronic obstructive pulmonary disease at an early stage of clinical advancement was referred by an internal care physician to the Otorhinolaryngology Department of Bogomolets National Medical University in Kiev. The patient reported wet, productive cough with an asthmatic component with no ENT symptoms at the same time. Within eight months prior to laryngological consultation, the patient remained under care of an internal medicine doctor. In this period, her physician applied anti-inflammatory and antibacterial treatment several times. Despite the use of various antibiotics, improvement of the clinical condition was not observed. The patient complained of more frequent episodes of paroxysmal cough at night and was not able to take a horizontal position during sleep. From the interview, it resulted that a year before she had been subject to dental treatment with root-canal treatment. Laryngological examination showed moderate swelling of the right nasal cavity mucosa with its congestion. No signs of persistent pathological content in the nasal cavities were obse-

erved. In the remaining laryngological examination, no variation from the correct state was discovered. The examining laryngologist referred the patient to an x-ray of the paranasal sinuses. Examination showed total opacification of the right maxillary sinus. To clarify the diagnosis and choice of treatment, the patient was referred for a CT scan of the paranasal sinuses. The result: bone structures of the maxillary sinus without signs of destruction. Right maxillary sinus was almost completely filled with homogeneous pathological content. There was a hyperintensive circular formation with dimensions of 6.2x3.5 mm within the described content, most probably a fragment of dental material excreted to the maxillary sinus lumen. Ostiomeatal complexes bilaterally patent (Fig. 1).

Surgery was performed after the patient has been prepared. Puncture of the maxillary sinus was done through the canine fossa using a trocar. A hole with a diameter of about 1.0 cm was made. Under the control of 0 degree and 30 degree endoscopes, pathological infiltration of soft consistency and gray-black color was removed. Maxillary sinus was rinsed and cleared of any residual content. The postoperative period was uncomplicated. The next day after surgery the patient reported significant improvement in the general condition. There was no cough at night, with no episodes of paroxysmal dyspnea in horizontal position. Antibacterial and antifungal treatment was used in the postoperative period. No complications or side effects of the therapy applied were observed. After being discharged from the ward, the patient was referred to the dentist for consultation and further treatment. Computed tomography examination of the paranasal sinus was performed 3 months after surgery. Result: right maxillary sinus free of pathological contents. Within the thickened mucous membrane, there are small (up to 2 mm) hyperdense fragments of excreted dental material. Ostiomeatal complexes are patent (Fig.3). The mucous membrane showed no signs of edema in laryngological examination, without signs of hyperemia. There was no evidence of pathological secretion within the nasal cavity. During the post-operative follow-up visit, the patient did not report ENT symptoms and ailments in the upper respiratory tract.

## DISCUSSION

Fungal sinusitis is a rare disease. Currently, more and more attention is paid to fungal pathogens of chronic rhinosinusitis (4). The analysis of literature indicates a quite rapid increase in the incidence of fungal sinusitis. Fungus ball diagnosis of Grosjean and Weber (5) in patients with sinusitis was done in 3.7% of all operated cases. The non-specific clinical picture or symptoms characteristic of other diseases within the upper respiratory tract that mask the underlying disease explains the

necessity of performing modern radiological examinations. Final diagnosis should always be made after full histopathological examination of the material obtained in surgery.

It should be emphasized that the invasive form of fungal sinusitis is characterized by a much more expressed clinic and symptomatology. It is more common in patients with immune disorders and may be life-threatening due to development of intracranial complications. In this situation, mortality can comprise up to 90% of cases (5,6).

Several theories explain the genesis of the fungus ball. The aerogenic theory assumes that fungal spores can accumulate in paranasal sinuses, initiating an inflammatory process in developing anaerobic conditions of different etiology. Another theory assumes that blockade of the ostiomeatal complex may be a primary and inflammatory factor, resulting in multiplication of fungal masses under anaerobic conditions. The aforementioned theories assume that periods of active growth in fungal flora can be interrupted by periods of remission. Exacerbating inflammation in sinuses may be a factor activating coexistence of a bacterial infection. In turn, purulent secretion becomes the ideal substrate for growth of fungal mass and further exacerbation of inflammation (7,8). One of the main theories that explain formation of a fungus ball is based on the toxic effect of zinc oxide on the sinus mucosa, which is the basic component of dental material. It becomes a factor inducing the inflammatory and necrotic process of mucosa at the moment of entering the sinus lumen during root-canal treatment (8).

Symptomatology of fungal sinusitis can be characteristic of bacterial inflammation: nasal breathing disorders, mucopurulent nasal discharge, headaches, unilateral pain in maxillary sinus projection, unpleasant odor from the nose. It should be noted that the disease may occur asymptotically or with symptoms that are not characteristic of sinusitis, namely: cough, fever, shaking chills, doubling in eyes (10). The disease may last for months or even years due to complete lack of symptoms or minor symptoms contributing to failure in diagnosis. A similar situation took place in this case. The patient was treated and remained under the observation of an internist for many months; he did not see the need for diagnosis. It was only computed tomography of the paranasal sinuses, recommended by a laryngologist consultant, that allowed to make the correct diagnosis and indicate the cause of chronic cough with nocturnal dyspnea.

The use of individual surgical access to the maxillary sinus should take into account the pathology within it. Each of the many accesses described in the literature have a number of advantages and disadvantages. Frequent methods of maxillary sinus surgery include ac-



Fig. 2. Pathological material taken from right maxillary sinus.

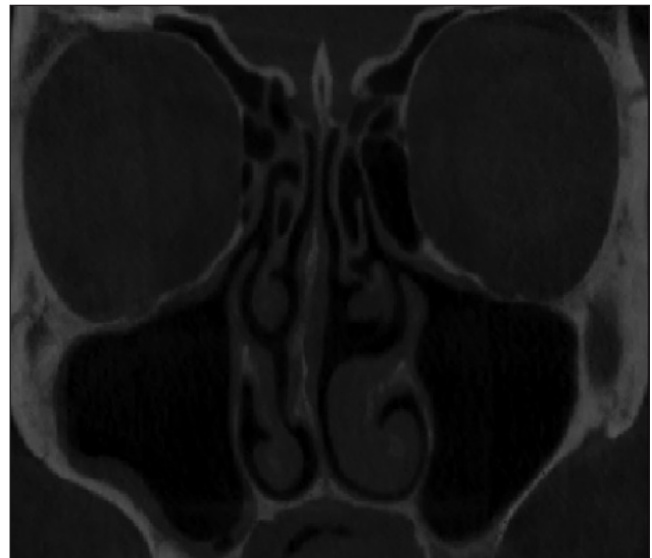


Fig. 3. CT of paranasal sinuses 3 months after surgery.

cess via the medial nasal cavity and the frontal wall of the maxillary sinus. The latter was successfully used in the case in question. The gold standard for treatment of fungal sinusitis is a surgical technique that uses a videoendoscope. It gives the possibility of minimally invasive and atraumatic removal of pathological infiltration from the maxillary sinus and elimination of infectious foci.

## CONCLUSION

Fungal sinusitis may be asymptomatic or present non-characteristic symptoms. Patients with symptoms of sinusitis following dental root-canal treatment should be particularly vigilant in diagnosis. Contemporary surgery of the paranasal sinuses should base on endoscopic techniques, and surgical access should be chosen individually in each case.

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