

CONE-BEAM COMPUTED TOMOGRAPHY IN THE DIAGNOSIS OF NASAL CAVITY FUNGUS BALL

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Purpose. To present the relevance of cone-beam computed tomography (CBCT) in diagnostics of nasal cavity fungus ball before surgery. **Materials and methods.** The clinical observation of the patient with nasal cavity fungus ball is provided. Patient's examination included anterior rhinoscopy, forward-viewing endoscopy, and CBCT.

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Results. After comprehensive clinical examination of the patient including CBCT accurate diagnosis was established: fungus ball in the left half of the nasal cavity. Endoscopic foreign body removal had been carried out with endotracheal anesthesia. It is required to perform histological examination.

Conclusion. The presented clinical case demonstrates the importance of CBCT application in pre-admission diagnostics of nasal cavity fungus ball.

Keywords: fungus ball, nasal cavity, cone-beam computed tomography.

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КОНУСНО-ЛУЧЕВАЯ КОМПЬЮТЕРНАЯ ТОМОГРАФИЯ В ДИАГНОСТИКЕ ГРИБКОВОГО ТЕЛА ПОЛОСТИ НОСА

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Цель исследования. Представить актуальность применения конусно-лучевой компьютерной томографии (КЛКТ) в предоперационной диагностике грибкового тела полости носа.

Материалы и методы. Приводится клиническое наблюдение пациента с грибковым телом полости носа. Исследование пациента включало переднюю риноскопию, эндоскопическое исследование полости носа при помощи торцевого эндоскопа и КЛКТ.

Результаты. После всестороннего клинического осмотра пациента был установлен диагноз: грибковое тело левой половины полости носа. Удаление грибкового тела осуществлялось эндоскопически под комбинированной эндотрахеальной анестезией. Дополнительно было выполнено патогистологическое исследование.

Вывод. Представленный клинический случай демонстрирует актуальность применения КЛКТ на дооперационном этапе диагностики грибковых тел полости носа.

Ключевые слова: грибковое тело, полость носа, конусно-лучевая компьютерная томография.

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Introduction. Fungal diseases of ENT organs are an actual problem of modern otorhinolaryngology. The main forms of ENT organs fungal diseases are pharyngomycosis, otomycosis, laryngomycosis, and fungal rhinosinusitis [1, 2]. The increase in the mycosis incidence is associated with many factors, including the widespread application of antibacterial drugs and steroids in medical practice. The majority of fungi



Fig. 1. Foto. Endoscopy of the nasal cavity.

A dense formation in the left inferior nasal meatus. The left inferior turbinate is enlarged.

Рис. 1. Фотография. Эндоскопия полости носа.

Плотное образование в передних отделах левого нижнего носового хода. Левая нижняя носовая раковина увеличена.

causing mycoses of ENT organs are opportunistic pathogens that cause the disease when immunological reactivity of the body decreases [3]. The main pathogens of ENT organs fungal diseases are mold fungi of the *Aspergillus* genus (up to 78%) and yeast-like fungi of the *Candida* genus. [4]. According to Russian authors, the incidence of fungal nasal and paranasal sinus infections among all inflammatory diseases of this region is up to 13% [5]. However, it should be noted that there are single references to isolated fungal lesion of the nasal cavity in the world literature [6]. Symptoms of this disease are non-specific and usually include difficulty in nasal breathing, nasal stuffiness and swelling of the nasal mucosa. Diagnosis of the nasal cavity fungus ball should be comprehensive, including clinical examination, endoscopy, radiological diagnostics and histological examination. Computed tomography is an important

part of the nasal cavity fungus ball diagnostics and planning of surgical treatment.

We describe a clinical case of a 29-year-old patient with a nasal cavity fungus ball, which required surgical treatment.

Purpose. To present the relevance of cone-beam computed tomography (CBCT) in diagnostics of nasal cavity fungus ball before surgery.

Materials and methods. The clinical observation of the patient with nasal cavity fungus ball is provided. Patient's examination included anterior rhinoscopy, forward-viewing endoscopy, and CBCT.

Case report. A 29-year-old patient was admitted to Clinic of ear, nose and throat diseases of Sechenov University with complaints of running nose, difficulty in nasal breathing, alternating nasal stuffiness and recurrent rinorrhea for a long time. The patient constantly uses nasal decongestants for many years. In past history the patient underwent rhinoseptoplasty (about 5 years ago). On examination change of the external nose shape, nasal arch deviation to the left, and the deviated nasal septum were found. The nasal septum is deviated to the right with the formation of a crest leaning against the inferior turbinate bone. Nasal passages are narrowed. Nasal cavity mucosa is pink, edematous.

At endoscopy there is a dark brown dense formation under the inferior turbinate penetrating the mucous membrane of the nasal cavity floor. The left inferior turbinate is enlarged. There is a poor mucous discharge in the nasal passages.

CBCT of the nasal cavity and paranasal sinuses showed the presence of formation (presumably fungal etiology) with a high density with distinct irregular contours in the region of the left inferior turbinate, not adjacent to bone tissues, 10.1 mm x15.2 mm x10.7 mm in size. Mucosal hypertrophy in the lower parts of both maxillary sinuses (in the right up to 2.3 mm, in the left up to 2.1 mm), in the left posterior cells of the ethmoidal labyrinth up to 2.1 mm is noted. Also, deviated nasal septum to the right up to 5.3 mm is detected. The right nasal passage is narrowed. The nasal mucous membrane is thickened.

The patient underwent surgical treatment. Endoscopic removal of the formation and reseptoplasty were performed. The formation was removed from the left side of the nasal cavity. It was



Рис. 2 а (Fig. 2 а)

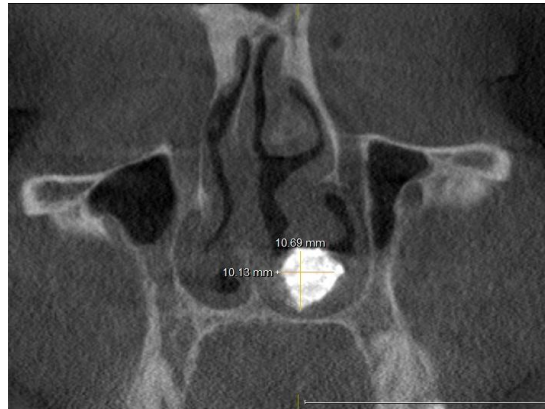


Рис. 2 б (Fig. 2 б)



Рис. 2 с (Fig. 2 в)

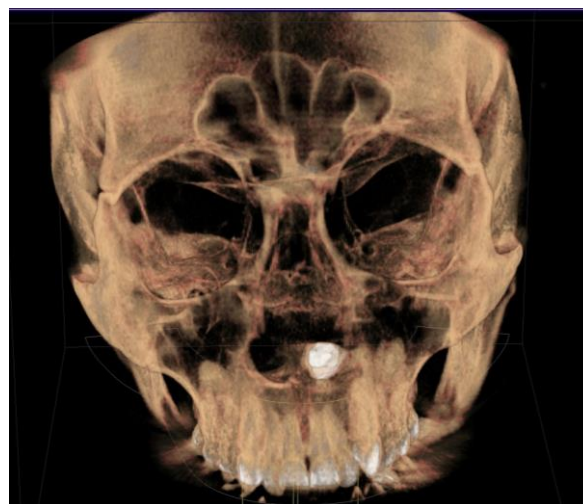


Рис. 2 д (Fig. 2 г)

Fig. 2. CBCT, axial plane (a), frontal plane (b), sagittal plane (c), 3D-model (d).

High density formation with distinct irregular contours in the region of the left inferior turbinate.

Рис. 2. КЛКТ, аксиальная плоскость (а), коронарная плоскость (б), сагиттальная плоскость (в), 3D-реконструкция (г).

Образование высокой плотности с четкими неровными контурами в области левой нижней носовой раковины.



Fig. 3. Photo. Gross specimen.

The Fungus ball.

Рис. 3. Фотография. Макропрепарат.

Грибковое тело.

dark brown dense structure about 1.5 cm x 1.5 cm in size located under the inferior turbinate closer to the nasal cavity floor.

The histological examination of tissues showed nasal cavity fungus ball.

The patient made a full recovery with complete resolution of his symptoms after 2 weeks.

Discussion.

The capabilities of cone-beam computed tomography (CBCT) and multislice computed tomography (MSCT) in the diagnosis of fungus balls of the nasal cavity and paranasal sinuses are completely comparable to each other and significantly exceed the traditional X-ray techniques for diagnostic information. The advantages of CBCT and MSCT in comparison with traditional radiography also include the lack of superposition, high contrast resolution and the possibility of obtaining 3D reconstructions [7]. Studies confirming the

possibility to establish a diagnosis of the fungus ball only on the basis of CT data are described [8]. This is due to the presence of certain CT - features of the fungus ball - a heterogeneous density of formation due to combination of contents soft tissue density (the presence of fungus ball masses and inflamed mucosa) with high-density inclusions relevant to the deposition of calcium salts and the formation of mycotic stones [9-11].

Conclusion. The presented clinical case demonstrates the informative value of CBCT in the

pre-admission diagnostics of the nasal cavity fungus ball. CBCT allows to define the diagnosis, determine the extent of the lesion, identify individual features of the nasal cavity structure, and plan optimal access during surgery.

Источник финансирования и конфликт интересов.

Авторы данной статьи подтвердили отсутствие финансовой поддержки исследования и конфликта интересов, о которых необходимо сообщить.

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