



DIAGNOSTIC TACTICS FOR CYSTIC LESIONS OF THE PARANASAL SINUS

Khayitov A.A.

Samarkand state medical university, Samarkand, Uzbekistan

e-mail: Alisherk75@mail.ru

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Abstract:

Inflammation of the paranasal sinuses (PNS) is the most common disease in the structure of pathology of the ENT organs. The origin of paranasal sinus cysts is usually associated with a chronic inflammatory process in the nasal cavities, and, according to some authors, the etiology of PNS is more related to allergies, therefore they are considered as a manifestation of allergic sinusitis. The aim of the study is to develop proposals and recommendations aimed at improving the early diagnosis of paranasal sinus cysts. The patients included in the study consisted of 66 women and 87 men (153 in total) aged 18 to 74 years, most of whom were of working age, with an average age of 31.4 ± 3.6 years. To assess the quality of life of the examined patients, we developed an electronic questionnaire "primary questionnaire for comparative diagnosis of diseases", and in order to select patients, we developed an electronic questionnaire "algorithm for early diagnosis of cystic sinusitis" and invited patients to fill them out. Based on a retrospective analysis of clinical cases in which patients have a PNS cyst, the main symptoms characteristic of these pathologies were identified. Computed tomography (CT), performed in coronary, axial and sagittal projections in all patients, has a clear advantage over X-ray examination, since it allows you to more accurately determine the size and composition of all pathological formations, their density (densitometry), as well as their location in the paranasal sinuses of the nose. Diagnosis of cystic lesions of the accessory nasal cavities should be based on comprehensive diagnostic measures, since they, in turn, have a direct impact on the choice of treatment tactics by patients.

Keywords: Paranasal sinuses, cystic formations, maxillary sinus, tomography, allergic sinusitis

Inflammation of the paranasal cavities (PNS) is the most common disease in the pathology of the ENT organs. Inappropriate use of antibiotics and high incidence of respiratory viral diseases - all this determines the annual increase in the number of patients with chronic sinusitis by 1.5-2.0%. One of the forms of chronic inflammation of the upper jaw cavity is its cystic damage.

In-depth scientific studies of the pathogenesis of cysts of the paranasal cavities have been taken into the center of attention by a number of researchers, who determine the urgency of the search for therapeutic corrections and rational methods of prevention (Alakhverdiev S.A., 2011; G.A. Gadjimirzaev, 2012; Baranskaya S.V., 2014; Sawatsubashi M., 2015; Kryukov A., 2019). Today, views on the diagnosis and treatment of cysts of the maxillary cavity are filled with new, effective information. However, there are no studies summarizing the treatment experience of a large number of patients with cysts in the nasal cavities. On average, cysts of paranasal cavities are detected in 21.6% of examined patients (Piskunov G.Z., 2009;

Lamkova A.Kh., 2011; Duncavage J.A., 2011; Kryukov A. I., 2015; Boyko N.V., 2019). Therefore, the high morbidity rate and the low effectiveness of conventional treatment methods make it necessary to search for and develop new local organ-sparing methods in the treatment of paranasal cavity cysts.

The origin of the cysts of the nasal cavities is usually associated with the chronic inflammatory process in the paranasal cavities. They are formed as a result of the exudation of the hypersecretion of the glands due to inflammation of the mucous membrane. Repeated inflammation plays a leading role in the development of true cysts, which cause persistent narrowing of the exit channels of the mucous membranes of the cavity. As a result of constant inflammatory process, their exudation and hypersecretion occurs against the background of blockage of the exit channels of the glands. The mucous membrane of the upper jaw cavities is rich in similar glands, therefore, numerous cysts are found on each wall of the cavity.



The results of clinical-laboratory and immunological examination of patients with cystic lesions of the paranasal cavities, given in the literature, testify to the general mechanism in the pathogenesis of the disease and the involvement of cellular immunity at the level of the mucous membrane of the nasal cavity, as well as immunopathological mechanisms manifested by bacterial sensitization. Out of the total number of sensitized patients, the most common type of sensitization is staphylococcal sensitization.

Chronic viral infection plays a major role in the formation of PNS cysts. Virological examination by immunofluorescent methods revealed viral antigens in epithelial cells. In case of viral infection of the glandular ducts, the movement of the cilia changes and slows down, which causes the secretion to be trapped and thickened in the glandular ducts. As a result, they become closed with dead elastic epithelial cells, which causes the gland to fill with fluid and its elongation, resulting in the formation of retention cysts. PNB is formed from the acinous glands of the mucous membrane of the cavity, they are the most in the maxillary cavity, and the least in the forehead cavity.

According to many authors, the etiology of PNS is more related to allergies, so they are considered as a manifestation of allergic sinusitis. Aerodynamic, toxic and infectious effects with constant and continuous influence change the structure of the mucous membrane of the upper respiratory tract. Due to the accumulation of histamine, acetylcholine, serotonin, and bradykinin-type mediators in it, the permeability of the capillary wall is disturbed, and the transfer of fluid from the vessels to the tissues occurs. The cyst is

formed by the accumulation of exudate in the special layer of the mucous membrane of the nasal cavity.

According to A.K. Lamkova (2011), an increase in the number and exposure of allergens, an unfavorable environmental situation (increasing the concentration of industrial gases, industrial dust and other human activity pollutants in the air far exceeding the permissible limits) are of great importance in the etiology of PNB cysts.

THE PURPOSE OF THE STUDY- development of proposals and recommendations aimed at improving the early diagnosis of paranasal cavity cysts.

RESEARCH METHODSThe patients included in the study consisted of 66 women and 87 men (153 in total) from 18 to 74 years old. Most of the patients were of working age, their average age was 31.4±3.6 years.

To assess the quality of life of the examined patients, we developed an electronic questionnaire "Initial questionnaire for comparative diagnosis of diseases" (DGU-20211236) and offered patients to fill them. When collecting the anamnesis of patients, they were asked the following questions, and then the data were recorded in a special questionnaire: In order to select patients, we developed an electronic questionnaire "Algorithm for early diagnosis of cystic sinusitis" (DGU 27394) and offered patients to fill it out. Based on a retrospective analysis of clinical cases in which patients had a PNB cyst, the main symptoms characteristic of these pathologies were determined. The questionnaire developed by us showed the symptoms of the disease (table 1).

1 table. Electronic survey questions

| Symptoms | Availability |
|---|---------------------------------------|
| Runny nose | load 0 1 on average obvious 2 |
| Headache | load 0 1 on average obvious 2 |
| Discharge from the nose | load 0 1 on average obvious 2 |
| Discharge of secretions along the back wall of the larynx | load 0 1 on average obvious 2 |
| Sense of smell | stored 0 decreased 1 burden 2 |
| Do you often get URVI? | load 0 yes, 1 up to 2 times a year |



| |
|--------------------------------------|
| yes, 3 times a year and 2 more times |
|--------------------------------------|

Each point is evaluated with 0.1 or 2 points. A total of 0 to 14 points can be scored. Completing the questionnaire was not difficult for any of the examined patients. According to the patients, the questions were formulated in a simple and understandable way. 0-3 points excludes ENT pathology, it is necessary to consult a neuropathologist or therapist to confirm the diagnosis. 4-8 points - there is a possibility of ENT pathology, additionally it is necessary to conduct PNS CT. 9-16 points, ENT pathology, full comprehensive examination is recommended.

Diagnostic puncture of the maxillary cavity is the simplest possible method for diagnosing PNB cysts, but it is not always a reliable method for cyst detection. On puncture, cystic fluid is detected only in 19% of subjects. Often, based on the nature of the contents of the cyst, its morphological structure can be suspected. The color and sedimentation of false cysts differ from true cysts as follows: true cysts are orange, and false ones are pale yellow; true cysts do not gel, but fake cysts do.

Also, as an additional examination method, especially in outpatient settings, PNB ultrasound can be used, which allows to identify about 80% of cysts.

X-ray examination and computed tomography data are of decisive importance for the short-term solution of the problem. On X-ray, false and real cysts are visible as clear, smooth, sharply demarcated, semicircular, oval, spherical, rarely irregularly "cushioned" shaped single structureless formations located in the lower and lower-lateral parts of the upper jaw cavity.

If the usual methods of X-ray examination do not solve the question of the content of the shadow in the cavity, the X-ray method is used, which is performed by injecting a contrast substance. For this purpose, iodolipol is often used, as well as verografin, iodamide, urografin, omnipak, in which a synthetic polymer is added to increase viscosity. On a direct contrast X-ray, if the contrast material enters the cyst cavity, the cyst interior is usually depicted as a well-defined rounded formation against the background of the unchanged cavity.

In cases where the contrast material does not enter the cyst cavity, the cyst is defined as a filling defect. Traditional methods of x-ray diagnosis of damage to the nasal cavity allow to have an informative diagnostic image, but the radiological similarity of diseases of different nature, the complexity of shadow interpretation, especially the large number of anatomical variants of the structure of the ENT organs,

make the actual situation difficult, and sometimes distorts it. Another shortcoming of traditional X-ray methods, which limits their informativeness in determining the pathology of the ENT organs, is the inability to see the entire complex of soft tissues in hidden areas, especially at the border of anatomical areas.

In contrast to radiography, computed tomography allows to determine the nature and spread of the process, to obtain information about the degree of densification of soft tissues, about the condition of inclined bony surfaces, for example, the back side wall. Computed tomography results agree with operative data in 70% of cases, and standard X-ray data only in 56% of cases. Therefore, the availability of preoperative computer tomograms prevents the surgeon from making unnecessary interventions in intact spaces, helps to plan the process and size of the future operation. In computed tomography, true and false cysts are identified as a single irregularly rounded formation with a wide base attached to the lower and lower-lateral wall of the cavity. An important diagnostic feature of retention cysts is retention of bony walls in their direct junctions. The characteristics of odontogenic cysts are the presence of a preserved bony border around the cyst (in 87% of cases) and their direct connection with the tooth roots (in 98.9% of patients): the presence of a bone tissue defect adjacent to the apex of the affected tooth root (or to the absent tooth site) in the area of the alveolar axilla, out displacement, if the size of the cyst is large - thinning or complete disappearance of the lower sections of the lateral wall of the upper jaw cavity is observed. The density of cysts varies, from 3 UN to +60 UN, depending on the composition of the cyst (serous, purulent, cholesteatoma).

The advantage of magnetic resonance imaging is that it can be performed in different planes without changing the patient's position. This method of examination is not related to the use of ionizing radiation, and the presence of side effects of magnetic fields has not been proven. In contrast to computed tomography, magnetic resonance imaging distinguishes soft tissues well, which makes it possible to differentiate between normal, inflamed, hypervascular and tumor tissues. However, a major disadvantage of magnetic resonance imaging is that when T1 and T2 are scanned sequentially, many normal and pathologically changed tissues can have the same characteristics, and these characteristics of tissues can change significantly under the influence of the pathological process. For example,



cysts of the nasal cavities will have a low intensity signal

most reliable diagnostic method in cystic sinusitis is

| bussines | One sided | | | Double sided | | | total | | | Chi-square | R |
|-------------------|-----------|-------|------|--------------|------|------|-------|-------|------|------------|-------|
| | abs | M(%) | m | abs | M(%) | m | abs | M(%) | m | | |
| Maxillary cavity | 77 | 50.32 | 2.98 | 56 | 36.6 | 2.98 | 133 | 86.92 | 0.00 | 70,511a | 0.000 |
| Forehead socket | 3 | 1.96 | 1.23 | - | - | - | 3 | 1.96 | 1.58 | 248,820b | 0.000 |
| A globular cavity | 2 | 1.3 | 0.72 | - | - | - | 2 | 1.3 | 0.72 | 243,209b | 0.000 |
| The main chef | 15 | 9.8 | 1.01 | - | - | - | 15 | 9.8 | 1.42 | 254,518b | 0.000 |

on a T1-weighted image and a T2-weighted image. Since the images are similar, it is difficult to distinguish such cysts from swollen polyps in tomograms. Thus, the

computerized tomography of the lateral cavities of the nose (table 2).

2 tables. The result of the location of cysts in the paranasal cavities

From the data presented in Table 2, it can be seen that in 86.92% of the examinees (133 people), cysts were observed in the upper jaw, where the process was recorded on one side (77 patients - 50.32%), compared to those on both sides (56 patients - 36.6%) were more.

Research results The main complaint of patients with a cyst in the paranasal cavity is a dull headache that occurs periodically, which is observed in the forehead area or on the side of the upper jaw where the cyst is located. In very rare cases, patients complain of

pain in the neck, head, temples, and a feeling of heaviness in the head. Headache is noted in 80.7% to 67% of cases of cystic sinusitis.

One of the main symptoms when assessing the quality of life of patients is headache, 136 (98%) patients reported this complaint, 97 (70%) patients complained of nasal discharge. Weakness was detected in 84 (61%) patients. 48 (34.5%) patients reported an unpleasant sensation observed in the projection of the maxillary cavity. In 108 (78%) patients, mucus flow along the back wall of the larynx was detected.

3 tables. Structure of patient complaints:

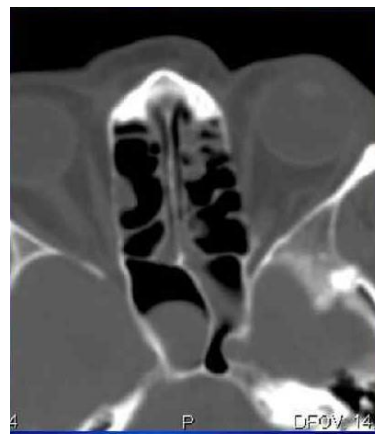
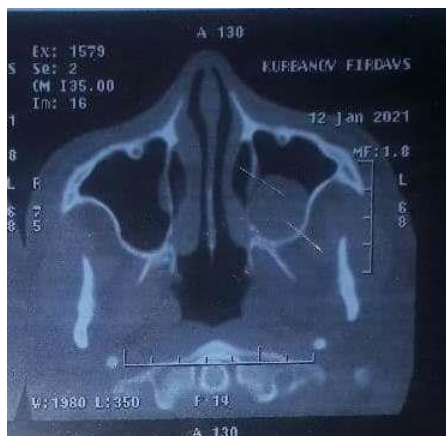
| Complaints | abs | M±m,% | Chi-square | R |
|--|-----|------------|------------|-------|
| Headache | 147 | 97.84±1.23 | 127,259 | 0.000 |
| Discharge from the nose | 105 | 69.78±3.89 | 21,763 | 0.000 |
| Runny nose | 126 | 83.45±3.15 | 62,223 | 0.000 |
| infirmity | 9 | 6.43±4.15 | 0.650 | 0.001 |
| Separation comes from behind the wall of my people | 116 | 77.70±3.53 | 42,655 | 0.000 |
| A feeling of discomfort in the area of vacuity | 51 | 34.53±4.03 | 13,302 | 0.000 |
| Decreased sense of smell | 69 | 46.76±4.23 | 0.583 | 0.445 |

All patients underwent computed tomography, which was performed on the Semens Somatom Sensation Cardiac apparatus (Germany). The examination was performed in axial, coronal and sagittal projections. The analysis of computed tomography allows us to conclude that when the examination is performed in axial and coronal projections, a large amount of information is obtained,

since the sphincter and maxillary cavity, as well as almost all structures of the nasal cavity, fall into the section cavity at the same time. Computed tomography performed in coronal, axial and sagittal projections has clear advantages over x-ray examination, as it allows to more accurately determine the size and composition of all pathological formations, their density (densitometry), as well as their location in the side

cavities of the nose. It should be noted that the data of computed tomography and magnetic resonance imaging have become an important navigational

material for more accurate, more careful and safer implementation of surgical interventions.



1 picture– Computed tomogram of the side cavities of the nose. A subtotal shadowing of the left maxillary cavity and the left basal cavity is seen with a high-contour domed appearance..

SUMMARY For the diagnosis of cystic lesions of the paranasal sinuses, it is necessary to use extensive diagnostic measures such as anamnesis collection, traditional examination methods of ENT organs, modern endoscopic methods, X-ray methods, and quality of life assessment. This, in turn, has a direct impact on choosing the right treatment tactics for patients.

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