Volume 2, Issue 10, October 2024 ISSN (E): 2938-3765

ETIOLOGY, EPIDEMIOLOGY AND TREATMENT METHODS OF MAXILLARY SINUS CYST: REVIEW OF LITERATURE

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Abstract

Cysts of the paranasal sinuses are benign, often asymptomatic formations. Most often, cysts are found in the maxillary sinuses (MSS). The purpose of the study is to summarize modern publications on diagnostics and treatment tactics for intracranial cysts. Material and methods. The review used publications presented in the information databases eLIBRARY, PubMed/MEDLINE, ScienceDirect, EBSCO, for the period from 2010 to 2024, which were found using the keywords: maxillary sinus cyst, clinical course, treatment. The analysis includes original studies on the problem of diagnosis and treatment of maxillary sinus cysts, as well as analytical reviews.

Keywords: cyst, maxillary sinus, computed tomography.

Introduction

Maxillary sinus cysts (MSCs) are a common finding during X-ray examinations of the paranasal sinuses (PSC). They make up from 89.5 to 92.7% of all cysts localized in the SNP [1–3]. The frequency of detection of intracranial cysts depends on the imaging method and varies widely - from 1.4 to 35.6% [1], on average, intracranial cysts are detected in 21.6% of those examined [4, 5]. The most informative methods for detecting SNP cysts are computed tomography (CT) and magnetic resonance imaging (MRI), which detect them with approximately the same accuracy [6] . The purpose of the work is to summarize modern publications on diagnostics and treatment tactics in relation to intracranial cysts.

Material and methods

The review used data from publications presented in the information databases eLIBRARY, PubMed/MEDLINE, ScienceDirect, EBSCO, for the period from 1972 to 2017, which were found using the keywords “maxillary sinus cyst, clinical course , treatment" . The analysis included original studies on the problem of diagnosis and treatment of maxillary sinus cysts, as well as analytical reviews.

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Results

The classification of cysts, which has not lost its relevance today, was proposed by M.I. Kadymova [7]: true or retention cysts; false or cyst-like formations; odontogenic cysts; cysts associated with developmental defects.

In the English-language literature, a distinction is made between secreting cysts (retention cysts) and non-secreting cysts (pseudocysts).

Retention cysts are formed as a result of obstruction of the excretory ducts of the glands of the mucous membrane [8]. Histological examination shows that retention cysts are bilaterally lined with ciliated columnar epithelium; the cyst wall consists of connective tissue with the presence of coarse collagen fibers [9] . On spiral CT (SCT), such cysts appear as round, homogeneous soft tissue formations on a broad base, with clear boundaries, without signs of bone destruction, and without connection with the roots of the teeth.

False (lymphectatic) cysts are located intramurally in the mucous membrane and do not have an internal epithelial lining, which is their only histological difference from retention cysts.

Presumable causes of the formation of false cysts are considered to be barotrauma, allergic and inflammatory diseases of the sinuses [3, 10, 11]. According to the results of the study by O. Berg et al. [10] revealed a high content of immunoglobulins, complement and antiproteases in aspirates from intramural cysts, which, along with the bacterial microflora present in them, supports the inflammatory theory of their origin; however, the content of immunoglobulin E (IgE) and eosinophils was within normal limits. The identity of the discovered bacterial flora with the microbiota of the oral cavity allowed the authors to suggest that the basis for the formation of intramural cysts is formed by the residual part of the dental layer.

Several prospective comparative studies have examined the associations between sinus cysts and sinus mucosal pathology and drainage disorders. J. Kanagalingam et al . [12] did not find a correlation between the occurrence of intracranial cysts and allergies, asthma, or block of the ostiomeatal complex. The lack of correlation between intracranial cysts and the state of the ostiomeatal complex was confirmed in other studies [13-15].

However, R. Harar et al. [14] noted that in the presence of a cyst, changes in the sinus mucosa, characteristic of chronic rhinosinusitis, are detected on SCT more often than in its absence (52.7 and 41.3%, respectively). The authors concluded that it is theoretically possible for a cyst to form due to transient obstruction of the ostiomeatal complex with subsequent preservation of the ICP after restoration of its patency.

The possible clinical manifestations of an intracranial cyst described in the literature are very diverse: headache and facial pain, difficulty in nasal breathing, postnasal drip, rhinorrhea, sudden discharge of amber fluid from the nose (which is associated with spontaneous rupture of the cyst), numbness of the upper lip, pain in the teeth, etc. [16-19] . However, in many cases, the description of symptoms does not contain evidence of their connection with the cyst.

In this regard, the study of F.V. is of interest. Semenova et al. [16] . The authors assessed the dynamics of complaints of 67 patients operated on for cysts of the upper jaw by questioning patients before and after the intervention, followed by data processing using mathematical statistics methods. Of the 14 symptoms indicated by patients as a reason to see a doctor, 4

disappeared after removal of the cyst: headache (mainly in the frontal region), a feeling of pressure in the projection of the affected sinus, difficulty in nasal breathing and clear nasal discharge/postnasal drip. numb (p <0.01). The authors concluded that these symptoms can most likely be associated with the presence of large cysts of the upper cervical spine.

If anatomical abnormalities are present, ICP cysts can cause unusual symptoms. N. Sharma et al. [20] described transient paresthesia in the facial area in a patient with an upper-crural cyst and dehiscence of the infraorbital nerve canal. The connection between paresthesia and the cyst was confirmed by its disappearance after removal of the cyst.

However, a number of prospective comparative studies did not reveal a correlation between intracranial cysts and sinonasal symptoms [12, 15]. S. Albu [15], in a prospective randomized study of 80 patients, found no correlation between cyst size and facial pressure or nasal obstruction or nasal discharge.

Often, ICP cysts do not manifest themselves at all and are an accidental finding. In a study conducted by the author of this review [21], asymptomatic cysts were identified in 37 out of 177 apparently healthy people (20.9%) who underwent SCT of the urinary tract for the purpose of occupational selection.

Patients with intracranial cysts often undergo surgical interventions in the absence of any complaints. Obviously, this is due to the fears of some doctors that cysts may grow larger and cause complications over time. In this regard, long-term observations using modern imaging methods that assess changes in the size of SNP cysts over time are of particular interest.

As follows from the summary of studies, an increase in the size of the cyst was observed only in 12.7% of patients, in 18.3% it disappeared, in 12.2% it decreased in size, and in 56.8% it remained unchanged.

Based on long-term observation of 18 patients J. Wang et al. [24] concluded that if

Since the size of the sinus cyst has not changed over 48 months, they will remain unchanged in the future, although P . Casamassimo and G. Lilly [25] did not note any dependence of changes in cyst size on observation time.

The most extensive research is work I. Moon et al. [2] - describes the dynamics of changes in the size of SNP cysts in 133 patients who underwent MRI of the brain for the purpose of preventive examination more than 2 times with a follow-up period of at least 24 months.

The average follow-up period was 40.38 ± 16.09 months (from 24.0 to 109.8 months). In 119 out of 133 patients, the initial study revealed cysts in the upper quadrant with sizes ranging from 13.35±9.22 to 15.49±6.94 mm. During follow-up from 24 to 36 months, the size of the cysts remained unchanged in 73% of patients, in 22% they decreased or disappeared, and only in 5% of cases there was an increase in the size of the cyst. Subsequently (more than 48 months), changes in the size of the cysts occurred in a greater number of cases: the sizes of 42% of cysts remained unchanged, 43% decreased or disappeared, and in 15% of cases the cysts increased.

Obstruction of the sinus anastomosis was detected only in 6 (4.5%) patients. The addition of rhinosinusitis during observation was registered in 4 (3.0%) of 133 patients, and in 3 of them there was an increase in the size of the cyst.

Summarizing the research data, it should be emphasized that spontaneous regression (reduction or disappearance) of the cyst occurred in 30.5% of cases. Results of Study I. Moon et al. [2], which

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had the longest observation period and the maximum number of patients included in it, showed that over time, an increasing number of cysts underwent regression, and the occurrence of complications was insignificant (3%).

Taking into account these data, the opinion of many researchers [12, 15, 25-28], who believe that the majority of patients with HF cysts do not require surgical treatment, is quite justified. I. Moon et al. [1] believe that only large cysts that cause obstruction of the sinus anastomosis require removal.

The development of modern rhinosurgery was marked by the introduction into practice of gentle methods for removing cysts of the upper jaw, which replaced the Caldwell-Luc method.

Today, the three most common surgical approaches are:

— gentle opening of the sinus through the anterior wall using a bur or trocar;

- endoscopic endonasal access through the middle meatus,

— endoscopic antrostomy through the lower nasal passage, as well as a combination of these approaches [26, 29—31].

In recent years, isolated publications have appeared on the use of the balloon sinoplasty method for the removal of cervical cysts [32, 33].

To select an adequate surgical approach, SCT of the SNP is of great importance, allowing to determine the localization of the cyst, while an important role is played by sagittal reconstruction, which makes it possible to assess the relationship of the cyst with the anterior and posterior walls of the sinuses [26, 34, 35].

In 70% of cases, cysts of the upper sinus are localized on the posterior-superior wall, in the lateral parts of the upper wall and in the area of the natural sinus anastomosis, which makes it possible to remove them by endonasal access through the middle meatus [26]. In cases where the cyst is localized on the anterior and medial walls of the upper jaw, as well as in the alveolar bay, the endonasal approach through the middle meatus often does not allow complete removal of the cyst and, therefore, other options or a combined approach are required.

A number of authors prefer antrostomy through the lower nasal meatus, explaining its advantage by the preservation of the natural anastomosis [28, 36], as well as convenience, simplicity of surgical technique and good visibility of the sinus [37].

Unfortunately, in the available literature, only a few studies have been found on the frequency of recurrence of intracranial cysts after the use of various sparing access techniques. One of these studies was published by T.V. Banashek-Meshcheryakova, F.V. Semenov [37]. The authors conducted a comparative analysis of the results of removal of intracranial cysts in 120 patients. The patients were divided into 3 groups of 40 people each and operated on via endonasal access through the middle and lower nasal meatus (2 groups) and extranasal access. During a postoperative observation period of 6 months, cyst recurrence was recorded in only 3 (7.5%) patients operated on through the middle meatus. There were no relapses with other access options.

Conclusion

Thus, ICP cysts in most cases are characterized by an asymptomatic course, tend to slow spontaneous regression or remain the same size and, as a rule, do not require surgical treatment.

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The indication for surgery is the presence of certain symptoms and large size of the cyst, causing irritation of the nerve endings of the sinus mucosa and/or obstruction of the sinus anastomosis from the inside. Endonasal endoscopic approaches in most cases allow one to obtain a good overview of the intracranial cavity and completely remove the cyst. To identify the optimal surgical approach for the removal of intracranial cysts, further studies of the incidence of complications and cyst recurrences when using different approaches are necessary.

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