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Diagnosis of Odontogenic Sinusitis

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Abstract: Odontogenic sinusitis is an inflammation of the mucous membrane of the maxillary sinus, resulting from the spread of the pathological process from the main source of infection located in the upper jaw. The main manifestation of the disease is a clear headache, which increases when the head is bent, purulent or serous nasal discharge, lacrimation and intoxication syndrome. Diagnosis is based on the collection of anamnestic data, general examination, rhinoscopy, sinus puncture and radiation imaging methods. Treatment includes antibiotic therapy, washing with antiseptics, surgical sanitation of the sinus cavity and the main lesion.

Key words: Causes, Pathogenesis, Classification, Symptoms of odontogenic sinusitis, Acute sinusitis

Odontogenic sinusitis is a common disease. The prevalence is from 3 to 52%, the average pathology occurs in 35-43% of the population. This variant of maxillary sinus injury accounts for approximately 14% of bacterial infections requiring treatment in the dental surgery department. This type of sinusitis accounts for 20-24% of the total number of inflammatory diseases of the maxillofacial area.

Among all forms of sinusitis, 80 to 96% have an odontogenic etiology. According to statistics, the disease is often observed in people with a pneumatic structure of the maxillary sinus, which is associated with the thinness of the bone walls and its penetration into the alveolar process. Men and women suffer equally often.

Reasons

This form of sinusitis is a complication of the inflammatory process in the tooth or upper jaw area. It is almost always caused by a mixed pathogenic microflora, which may include staphylococci, streptococci, diplococci, enterococci, gram-positive and gram-negative rods, and yeast fungi. Conditions often complicated by odontogenic sinusitis include:

Diseases of molars and premolars. Usually these are infectious lesions of upper jaw teeth, odontogenic periostitis and osteomyelitis, chronic periodontitis, purulent periodontitis and purulent jaw cysts.

Endodontic therapy. The disease can occur as a result of dental treatment of premolars and molars, in which the apical hole is drilled, filling material, intraosseous implant elements, etc. are introduced into the sinus cavity.

Injuries. Traumatic injuries to the teeth and/or upper jaw accompanied by perforation of the wall of the maxillary sinus and the formation of a hematoma are the least common cause of the development of this form of sinusitis.

Pathogenesis

The pathogenesis of odontogenic sinusitis is associated with the spread of bacterial microflora and its metabolic products (toxins) into the maxillary sinus cavity from the primary foci of infection - affected teeth or wounds in the upper jaw. This is possible due to the structural features of the alveolar processes of the upper teeth 6 and 7 (rarely 5 and 8), which are separated from the sinus only by a thin bone wall. As a result of purulent dissolution or mechanical perforation of the septum, infectious agents enter the sinus cavity and cause inflammation of the mucous membrane.

Then, the natural entrance of the sinus is blocked. This leads to a violation of ventilation and the accumulation of a large amount of catarrhal or purulent exudate in the bone cavity. Absorption of oxygen by the mucous membranes leads to the formation of negative pressure, which increases swelling, develops hypercapnia and hypoxia, and produces a large amount of poorly oxidized products. A favorable environment is created for the further growth of anaerobic microflora and a vicious circle is formed.

Classification

Taking into account the duration of the course, all odontogenic sinusitis are divided into three main clinical options:

Bitter. The duration of the disease is less than 21 days.

Subacute. This option usually lasts from 21 days to 6 weeks.

Chronic. Prolonged form of the disease in which clinical symptoms last 6 weeks or more.

Depending on the nature of odontogenic damage to the maxillary sinus, the following forms of pathology are distinguished:

Closed. It is characterized by the development of inflammation without a direct connection between the primary lesion and the maxillary sinus. The main causes are chronic periodontitis and suppuration of sinus cysts.

It's open. The spread of microflora from the oral cavity occurs due to purulent dissolution of one of the walls of the maxillary sinus cavity. Complications of perforated sinusitis and osteomyelitis include upper jaw.

Based on the nature of the morphological changes in the mucous membrane of the maxillary sinus, it is customary to distinguish the following options:

Catarrhal. It manifests itself by filling the sinus cavity with serous exudate and severe swelling of the mucous membrane.

Purulent. The formation of a large number of purulent masses is noted, inflammation and destructive changes are detected in the inner membranes of the sinus.

With polyps. The main difference from other options is the formation of seals in the mucous membrane of the sinus, which later forms polyps.

Purulent-polyposis. It is a combination of purulent and polypous forms.

Symptoms of odontogenic sinusitis

Acute sinusitis

From a clinical point of view, it is appropriate to distinguish two forms of the disease - acute and chronic. In the acute version, there is a sharp throbbing paroxysmal headache, a feeling of heaviness or fullness in the right or left upper jaw. Painful sensations can also be localized in the area of teeth and mimic pulpitis. The pain increases when lowering the head.

Later, a general intoxication syndrome appears, which is characterized by chills, general weakness, weakness, fever up to 38.5-39.5 ° C and shivering. The process of chewing food becomes painful, the teeth are much longer than before. In many patients, nasal breathing is disturbed, the ability to distinguish smells is lost, photophobia and lacrimation increase. One-sided runny nose is detected, which is accompanied by the release of large amounts of mucus and/or purulent masses.

Chronic sinusitis

With chronic odontogenic sinusitis, the clinical picture develops gradually. The course of pathology resembles a wave, exacerbations occur after hypothermia or acute viral diseases of the upper respiratory tract. The main symptom is a severe one-sided headache or a clear feeling of heaviness. This symptom is almost immediately accompanied by pain in the maxillary region with radiation to the orbit, temporal and frontal region and adjacent upper teeth.

Nasal discharge can be of different character and volume - from more to less, from serous to purulent. The largest amount of discharge is usually observed in the morning and gradually decreases during the day. A characteristic symptom is increased pus when the lower jaw is pressed to the chest. There may be no discharge in non-purulent forms and fistula formation.

Complications

The most common complications of odontogenic sinusitis include meningitis, orbital cellulitis, and venous sinus thrombosis. Their appearance is associated with the spread of pathogenic flora through the anterior facial and orbital veins to the orbital cavity, sigmoid sinus and cerebral venous system. In severe cases, in the absence of timely treatment, diffuse osteomyelitis of the upper jaw develops, which leads to the destruction of bones and the formation of a clear cosmetic defect. In

rare cases, sepsis, myocardial and kidney damage are observed in patients. Generalization of infection is associated with the entry of bacterial agents and their toxins into the systemic bloodstream.

Diagnostics

Diagnosis of odontogenic sinusitis is based on a comprehensive analysis of anamnestic data, results of clinical and auxiliary research methods. Diagnosis and treatment of the patient is usually carried out jointly by an otorhinolaryngologist and an oral and maxillofacial surgeon. A complete list of diagnostic measures includes:

Collect complaints and medical history. When questioning the patient, along with a detailed description of specific complaints, it is necessary to determine the presence of existing or previously suffered dental diseases, the nature of recent therapeutic measures in the upper jaw.

General inspection. Swelling of the paranasal area and cheeks, reddening of the skin on the affected side can be detected. Pain increases with palpation and percussion of the maxillary sinus and zygomatic bone.

Previous rhinoscopy. Visual examination of the nasal cavity from the side of the affected sinus reveals hyperemia and swelling of the mucous membrane of the middle and / or lower turbinate. Exudate can be removed from under the free edge of the middle concha.

Examination of the maxillary cavity. In addition to rhinoscopy, it allows to determine the presence of purulent contents in the maxillary sinus when its natural drainage hole is blocked.

Maxillary sinus puncture. It combines diagnostic and therapeutic purposes, as it allows to detect even a small amount of pathological content in the sinus, and then it is washed with antiseptic agents.

X-ray of the paranasal sinuses. X-ray reveals the darkening of the sinus cavity and the presence of a horizontal fluid level. To determine the etiology, an x-ray of the teeth on the affected side is performed.

Laboratory tests. A general blood test reveals leukocytosis, a shift of the leukocyte formula to the left, and an increase in ESR. In the presence of purulent discharge, a bacteriological study is carried out to determine the specific pathogen and its sensitivity to antibiotics.

Differential diagnosis is carried out with rhinogenic and allergic sinusitis, maxillary sinus cancer. The first two diseases are characterized by the involvement of both maxillary sinuses in the pathological process and are not related to dental pathologies or manipulation. In rhinogenic sinusitis, the development of clinical symptoms occurs against the background of diseases of the nasal cavity, in the allergic version - after contact with an allergen or during a seasonal exacerbation. With a malignant tumor, the symptoms develop gradually, there is no intoxication syndrome and discharge of purulent mass or serous exudate from the nose.

Computed tomography of the paranasal sinuses. A general decrease in pneumatization of the right maxillary sinus against the background of disruption and elevation of the integrity of its lower part (red arrow) near the roots of the 1st molar (blue arrow).

Computed tomography of the paranasal sinuses. A general decrease in pneumatization of the right maxillary sinus against the background of disruption and elevation of the integrity of its lower part (red arrow) near the roots of the 1st molar (blue arrow).

Treatment of odontogenic sinusitis

Therapeutic tactics largely depend on the variant of the disease. In the absence of severe dental pathology, treatment of the acute form is carried out in the clinic. Chronic inflammation of the maxillary sinus often requires hospitalization in a hospital, followed by surgery. The main therapeutic measures include:

Antibacterial therapy. It is used regardless of the form and etiology of sinusitis. Before obtaining the results of bacterial culture, broad-spectrum antibiotics are prescribed, after which drugs to which the cultured microflora are sensitive are prescribed.

Washing with antiseptics. The introduction of antiseptic solutions is carried out through a defect created in the lower jaw or through a diagnostic puncture using a Kulikovsky needle. After washing, drainage of the sinus cavity is established.

Surgery. It is used for chronic and polypous forms of lesions. Surgery (maxillary sinusotomy) is performed using the Caldwell-Luc technique. Its essence lies in sanitizing the sinus cavity, cutting the pathologically changed mucosa and creating an artificial anastomosis with the nasal cavity.

Prognosis and prevention

The prognosis of odontogenic sinusitis depends on the timeliness and reasonableness of treatment measures. With the right therapy, treatment of the acute form of the disease lasts 7-14 days, and the result is recovery. In the chronic version, complex treatment can last up to 3 weeks, then remission or complete recovery.

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