



MODERN METHODS OF DIAGNOSIS OF SALIVARY GLAND DISEASES

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Resume

Among dental pathology, diseases of the salivary glands, according to a number of authors, range from 3 to 7%. Of these, salivary stones account for up to 30%, various forms of chronic sialadenitis and sialadenosis – up to 60%, congenital anomalies – up to 1% and tumors-up to 5%. Various methods of diagnosing diseases of the salivary glands do not fully meet the requirements of doctors to make a final decision on the choice of treatment for various diseases of the salivary glands, as result of which patients receive untimely or inadequate care. In this article, the authors consider modern issues of diagnosis and treatment of diseases of the salivary glands. The current state of the problem is studied, problems in this area identified and analyzed, and the need for further improvement of research methods and diagnostics of diseases of the salivary glands is justified.

Keywords: Salivary gland, sialadenitis, sialadenosis, radiation diagnosis, MSCT-sialography, diagnostic puncture, mumps, differential diagnosis

Among dental pathology, diseases of the salivary glands, according to a number of authors, range from 3 to 7%. Of these, salivary stones account for up to 30%, various forms of chronic sialadenitis and sialadenosis – up to 60%, congenital anomalies – up to 1% and tumors-up to 5%.

Despite the existence of a large number of different methods for the study of SG (sialography, sialosonography, computed tomography of the salivary glands, etc.), allowing to identify a particular form of pathology, currently there are still difficulties in conducting differential diagnosis. Of particular importance are the methods of radiation diagnostics, with the help of which it is possible to study both the topography of the organ and its functional capabilities. However, there is no single diagnostic and therapeutic approach to the study of salivary gland pathology [2,9,10].

Various methods of diagnosing diseases of the salivary glands do not fully meet the requirements of doctors to make a final decision on the choice of treatment for various diseases of the salivary glands, as result of which patients receive untimely or inadequate care. In these cases, the long course of the disease leads to the development of complications, the treatment of which presents significant difficulties. Widely used sialosonography and contrast-free computer-assisted sialotomography do not allow us to assess the anatomical features of the ductal system [4,6,11].

Recently, in order to diagnose various diseases of the salivary glands, the method of multi-spiral computed tomographic sialography (MSCT-sialography) has been used, which allows for a high level of differential diagnosis of various pathological processes.

In the literature, there are isolated reports of the use of MSCT in the diagnosis of diseases of the SG. At the same time, it seems advisable to study the possibilities of MSCT-sialography in order to improve the effectiveness of the diagnosis of SG.

Also, one of the important components of MSCT-sialography is the ability to evaluate the information



obtained in the analysis of multiplanar and ZB reconstructions. The above facts were the basis for this work.

For the diagnosis of SG diseases, it is necessary to widely used not only general methods of examination (survey, examination, palpation, urine, blood, radiography), but also private (used in the examination of patients with certain diseases) and special methods (requiring special medical skills and special equipment and allowing you to get additional data to clarify the diagnosis) [5,15]. Special methods include probing of the excretory ducts and overview radiography of the SG area, investigation of their secretory function, qualitative analysis of saliva (study of physical and chemical properties), cytological examination of secretory smears, sialography and pantomosialography. However, X-ray examination of the SG and their ducts in the lateral projections in some cases turns out to be uninformative, since even with X-ray positivity of the salivary concretion, it falls into the shadow of the bone tissue of the lower jaw. In addition, it known that concretions localized in the parotid SG contain a large amount of X-ray negative organic substances, which causes the ineffectiveness of radiography of the parotid SG in the diagnosis of calculous sialoadenitis. Contrast sialography in most cases identifies the intra-flow barrier, without giving accurate information about its qualitative composition.

Material and methods. Modern scientific literature used as the material.

Results and discussion. The most informative and reliable methods are special methods for the study of SG, which dictates the need to expand the indications for their use.

Computer and magnetic resonance sialotomography are effective when the concretion enters the cut plane, with a small diameter of the concretion (less than 5 mm), the informative value of the method decreases sharply.

The method of sialosonography (ultrasound) based on different degrees of absorption and reflection of ultrasound by the tissues of the SG with different acoustic resistance. Sialosonography gives an idea of the macrostructure of the SG.

According to the echogram, it is possible to judge the size, shape and ratio of the layers of gland tissue with different densities, to identify sclerotic changes, salivary stones and the boundaries of neoplasms.

Thermosialography (thermal imaging) allows you to observe the dynamics of temperature changes in the area of the SG, determining the effectiveness of the treatment.

The method of radioisialography of parotid SG (radio-isotope sialometry) consists in recording the curves of the intensity of radioactive radiation over the parotid SG and the heart after intravenous administration of sodium pertechnetate and allows you to evaluate the function of the SG.

Diagnostic punctuation refers to morphological methods of investigation. However, due to its low information content, the most commonly used biopsy is small SG. At present, clear quantitative and qualitative criteria developed for the evaluation of small SG biopsy data. The most common condition of glandular tissue is fibrosis, which localized in the stroma or periductally. The second most important parameter is the presence of infiltration, which differs in localization (in the stroma or periductally), in type (mononuclear, eosinophilic,



neutrophilic, lymphoid) and in the degree of manifestation (weak, medium, strong). The type of infiltration suggests the type of pathological process. Thus, lymphoid infiltration indicates the need for differentiation of lymphoma, rheumatoid granuloma, autoimmune process; neutrophilic infiltration indicates a primary, often bacterial process; mononuclear - for a chronic inflammatory process caused by viruses (cytomegalovirus, Epstein-Barr, herpes), intracellular bacteria (chlamydia, toxoplasma, mycoplasma) or fungi. Quantification is the number of cells in the infiltrate. Atrophy characterized by the number of non-functioning glands per unit area. The histological description of the drug also includes an assessment of the condition of the excretory ducts, which not be changed, narrowed-in sialoses and cystically expanded-in sialodochitis. Comparison of the results of small SG biopsy with the data of the main and additional research methods, taking into account the presence of general somatic pathology, can significantly reduce the likelihood of making an erroneous diagnosis.

A modern therapeutic and diagnostic method is sialoendoscopy of large SG with the use of microendoscopes, which allows you to visualize the extra-vascular portion of the excretory duct of the gland. The survey area includes most areas of the intra-glandular ductal system, up to the ducts of the 2nd– 3rd, and in some cases, the 4th-5th orders. The presence of a second working channel in the endoscope tube allows you simultaneously perform the necessary therapeutic manipulations (buging, balloon plastic surgery, intra-flow focal laser exposure, complete removal or fragmentation of concretions or foreign bodies).

For sialoendoscopic examination, special diagnostic criteria have been developed, such as the color of the duct wall, its elasticity; the presence of vascular injections in the duct wall; the presence of pathological inclusions in the duct lumen – concretions fixed in the duct or mobile, migrating, mucous plugs, fixed elastic plaques, obstructing the ducts, polyps; the presence of stenoses.

Endoscopic examination of large SG is a minimally invasive, simple and highly informative procedure. It is important that each form of chronic sialoadenitis correspond to a specific endoscopic picture, which allows you to determine the form of sialoadenitis with a high degree of accuracy.

The endoscopic picture in parenchymal sialoadenitis characterized by the presence of unevenly expanded sections of the ducts of the 3rd-4th order. In such patients, parietal mucosal plaques found on the inner surface of the duct. In most patients, mucosal plugs in the ducts of the 2nd-3rd order detected, which partially or completely obturate the lumen of the duct. The walls of the duct, as a rule, have a light pink color with pale pink and whitish areas.

In chronic interstitial sialoadenitis, the duct system characterized by edema and pasty wall. Individual ducts of the 2-3-th order are sharply narrowed and difficult to pass through the endoscope tube. In some patients, the duct mouths surrounded by fibrous rings, which is classified as stenosis in the area of ductal furcations. The color of the inner surface of the ducts is uniform, pale yellow or grayish-pink [2,9,14].

The main sign of sialodochitis is the injection of blood vessels in the walls of the main duct and ducts of the 1st, 2nd and 3rd orders. The vascular pattern expressed unevenly – sections of the duct wall with a pronounced vascular network alternate with anemic fragments. At all levels, there is hyperemia of various sections of the ducts, which is associated with areas of ischemia and



sclerotically altered fragments. In the lumen of the ducts, pathological inclusions found in the form of flocculate formations of irregular shape. The color of the duct wall varies from bright pink to burgundy with a smooth, shiny surface that resembles pearl.

The possibility of simultaneous surgical intervention on the ductal system makes sialoendoscopy the method of choice in the diagnosis and treatment of chronic inflammatory pathology of large SG. Microbiological study of the microflora of the SG ducts shows the presence of a specific microflora that causes the development of sialoadenitis: in exacerbations of chronic sialoadenitis, the contents of the ducts are dominated by mixed microflora, represented obligately and facultatively by anaerobic species (in the selected associations, microaerophilic streptococci and gram-negative bacilli of the Enterobacteriaceae family). The detected microflora is in most cases sensitive to beta-lactamaznimpenicillins and modern fluoroquinolones (amoxiclav, levofloxacin, moxifloxacin). These antibiotics are highly effective and are the drugs of choice in patients with reactive dystrophic diseases of the salivary glands[6,9,15].

The crystal structure of saliva under the influence of metabolic disorders that accompany the inflammatory process undergoes pronounced changes. Of the considered preparations, those in which there are no foci of crystallization predominate. There is a perpendicular growth of crystals, their destruction, there are inclusions of an amorphous form (additional signs of inflammation).

Taking account the above changes, it is reasonable to conclude that during the inflammatory process, the crystal structures undergo significant changes. This evidenced by a violation of the structural organization, a significant inhibition of crystal formation and the formation of defective morphological forms. The latter circumstance may be associated with a change in the chemical composition of saliva during the development of a pathological process in the salivary gland.

In the study of gas-discharge images of saliva of patients with various inflammatory diseases of the large salivary glands and individuals of the control group, changes in all six studied parameters clearly traced.

In acute purulent mumps, characterized by the most clearly clinically manifested local and general signs of inflammation, such parameters of saliva GRV-grams as image area, fragmentation, and shape coefficient had the maximum value. The parameters characterizing brightness and fractal discreteness lowered.

In patients with chronic mumps, the indicators of fragmentation, deviation and fractal discreteness are increased.

Thus, the shape and structure of the GRV images of saliva varies depending on its chemical composition, which directly depends on the state of physiological and pathological processes occurring in the tissues of the gland.

Protein peroxidation is a free radical process in which reactive oxygen species react with endogenous substrates to form peroxide compounds. Changes in this mechanism at one level or another lead to pathological disorders [3,7,17].

The activity of POB processes in the saliva of patients with various forms of inflammatory diseases of the large salivary glands analyzed in order to evaluate the effectiveness of the treatment.

The study revealed protein oxidation products in saliva that reacted with 2,4-dinitrophenylhydrazine.



Quantitative parameters of carbonyl derivatives of proteins in the saliva of patients with sialadenitis indicate the presence of characteristic features depending on the form of the disease [3,7,15].

The extremely high content of carbonyl derivatives of proteins in the saliva of patients with acute purulent mumps reflects the level of saliva peroxidation, which indicates the suppression of the anti-radical defense of the body and leads to pathological changes, both at the biochemical and clinical level. The study of the degree of oxidative modification of saliva proteins in patients with inflammatory diseases of the salivary glands after a course of treatment allowed us to evaluate the effectiveness of their complex treatment.

The indicators of the intensity of oxidative modification of saliva proteins found in the biochemical study in patients at admission to the hospital and before discharge from the hospital (approximately 10-12 days) underwent the following changes [5,8,10].

After the course of traditional treatment, the intensity of oxidative modification of saliva proteins decreased to 2/3. The greatest decrease in the degree of oxidative modification observed in patients with acute purulent mumps. However, the vast majority of indicators differ from what we have accepted as the norm [6,14].

Changes in these parameters correlated with the clinical dynamics of the inflammatory process. At the time of discharge from the hospital, all patients noted the disappearance of general and local signs of inflammation. In the saliva of the examined persons, pathological inclusions disappeared, the viscosity and the level of secretion were normalized. There was a change in laboratory parameters: leukocytosis, rod-shaped shift decreased, ESR decreased.

Differential diagnosis of SG diseases is associated with a large number of diagnostic errors. A retrospective analysis of the medical histories of patients with this pathology shows that only in 24% of cases the initial correct diagnosis detected. Among the reasons for diagnostic errors, it should be noted that the doctors are not qualified enough, the anamnesis is incomplete, and the patient examination scheme is violated. Most doctors do not have special diagnostic methods, and many medical institutions do not have equipment for in-depth studies of SG [2,9,15].

Conclusions

Thus, a thorough collection of anamnesis and a comprehensive examination of patients suffering from sialosis and chronic forms of sialoadenitis are a prerequisite for making a definitive diagnosis. In cases of persistent, recurrent disease, examination and treatment carried out in a multidisciplinary hospital with the involvement of specialists such as rheumatologists, gastroenterologists, endocrinologists, oculists, neuropathologists, etc.

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