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Rare Non-Tumor Diseases of the Pharynx and Larynx

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ABSTRACT

Some inflammatory systemic and non-systemic diseases of the pharynx and larynx can clinically simulate the course of the tumor process. In these cases, the computed tomography method provides a comprehensive examination of patients, significantly adding information to the endoscopic picture. 4 clinical cases are presented, united by common aspects: suspicion of a tumor process and the absence of typical computed tomography symptoms characteristic of a tumor lesion. IgG4-related sclerosing disease, rheumatoid arthritis, amyloidosis and actinomycosis are rare conditions, however they should be included in the differential diagnosis. In this regard, knowledge of the radiation characteristics of these rare nosological forms will be useful to a practicing specialist.

Inflammatory diseases, including acute bacterial and viral laryngitis, are the most common pathology of the larynx, in most cases being part of the symptom complex of acute respiratory viral infection. There is no exact information about the occurrence of acute laryngitis. Patients with acute or chronic laryngitis, as a rule, do not need radiation examination, since a specialist examination and laryngoscopy are sufficient to diagnose the disease. However, an atypical clinical picture of the pathology of the pharynx and larynx may target the doctor to search for more threatening diseases, including simulating tumor lesions. In such situations, computed tomography provides a rapid examination of patients with suspected inflammatory infectious and non-infectious diseases of the pharynx and larynx, significantly adding information to the endoscopic picture. Computer tomography examines: the state of the respiratory tract, the spread of the pathological process beyond the mucosa, the duration of changes, the involvement of cartilage, the invasion of adjacent anatomical structures, including Almanac of Clinical Medicine. 2015 December; 43: 100-108 pharynx, tongue root, esophagus area, trachea or soft neck tissues. Regional lymphadenopathy and neurovascular spread of pathological changes are also evaluated. Knowledge of the features of the computed tomography picture in inflammatory lesions, even of unknown etiology, allows for correct diagnosis, which, in turn, determines the tactics of treatment.

The aim is to evaluate the possibilities of multispiral computed tomography in the diagnosis of rare pathological conditions of the larynx.

Material and methods

The material for the work was 4 rare clinical observations from our practice : 2 men and 2 women aged 40 to 74 years with a suspicion of laryngeal tumor process. All patients underwent multispiral computed tomography on Philips devices Brilliance 16 and iCT (256 slices)

according to the standard protocol before and after intravenous bolus administration of iso- or hypoosmolar iodine-containing contrast agents.

Results and discussion

In all cases, according to the results of the studies, the absence of typical computer-tomographic symptoms characteristic of a tumor lesion of the larynx was noted.

This became a prerequisite for a more thorough analysis of the clinical and radiological picture in order to search for another possible genesis of the identified changes. In the end, several rare nosological forms were diagnosed, which we will focus on in more detail. IgG4-associated sclerosing laryngeal disease IgG4-related sclerosing disease is a recently described immune–dependent systemic pathology with general pathophysiology and vari-abel manifestations characterized by diffuse or focal inflammatory in-filtration of affected organs and tissues by plasma cells expressing IgG4. Subsequently, the development of obliterating phlebitis and fibrosclerosis of the corresponding organs is noted. The disease proceeds with varying degrees of aggressiveness involving one organ or multisystem pathological changes. Symptoms depend on the target organ. The most frequently affected are the gastric gland (with the development of autoimmune pancreatitis) [1], the biliary system (sclerosing cholangitis) [2], lacrimal and salivary jellies (Mikulich's disease) [3], elements of the orbit [4], morphological changes in the structure of cells in patients with rheumatoid arthritis [5], kidneys (tubulointerstitial nephritis) [6], retroperitoneal space (retroperitoneal fibrosis) [7], aorta (aortitis) [8], intestines (mesenteritis), prostate and mammary glands, lungs, pericardium, meninges, pituitary gland, lymph nodes and skin. Extensive infiltration of IgG4 by plasma cells and T-lymphocytes of the affected organ or organs disrupts the formation and functions of tissues, and also initiates an intensive inflammatory reaction [9]. These processes lead to fibrosis, obliterating phlebitis and the formation of infiltrates within the affected organ, which are often mistaken for tumors. Due to the slow progression of the disease, patients may have erased and nonspecific symptoms, more associated with ot.

Since malignant tumors are usually assumed in patients with IgG4-sclerosing disease at the initial detection, an accurate differential diagnosis is necessary in order to avoid unnecessary surgical intervention. The nature of the fibrosing process characteristic of IgG4-sclerosing disease remains unclear, however, all manifestations in general are well amenable to therapy with immunosuppressants, in particular glucocorticoids, especially with early initiation of such treatment. This determines the necessity and importance of early diagnosis and the development of appropriate diagnostic criteria.

We have not found descriptions of isolated lesions of the throat in IgG4-sclerosing disease in the domestic and world literature. We present our own clinical observation.

Patient K., born in 1948, with a diagnosis of IgG4-sclerosing disease with an isolated lesion of the larynx, was observed in the Bukhara hospital of the multidisciplinary medical clinic of the Ministry of Health of Uzbekistan for 3 years. It is known from the anamnesis that complaints of difficulty breathing through the natural respiratory tract, shortness of breath and weakness appeared in January 2022. After 3 months, he underwent a comprehensive examination. When examined from the larynx, a moderate restriction of the mobility of its right half was determined; the mucous membrane was of normal color, smooth; the lumen was narrowed due to thickening of the right vestibular and vocal folds. A submucosal tumor of the throat was suspected (Fig. 1).

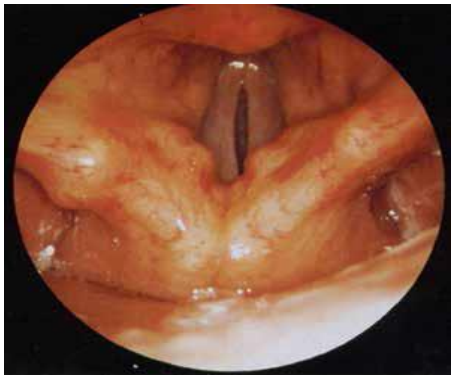

Fig. 1. Endophotography of the larynx: asymmetry of the larynx due to the displacement of its right half to the left. The vestibular and vocal folds on the right are enlarged in size. The right pear-shaped pocket does not open. Voice the gap at the level of the vestibular and vocal parts of the larynx is narrowed.

Computed tomography of the neck before and after intravenous bolus administration of a low-osmolar iodine-containing contrast agent in the amount of 100 ml revealed changes regarded as a picture of an extended tumor of the posterior wall of the throat with destruction of cartilage, spreading to the trachea; involvement in the process of the upper esophagus was also not excluded (Fig. 2). At the same time, a zone of tissue infiltration without clear contours was visualized from the level of the suprasplastic department along the posterior wall of the larynx, forming a picture of additional formation of weakly inhomogeneous density, irregular shape, with uneven and indistinct outlines. The extended destruction of the cricoid cartilage plate, almost total destruction of the right and less pronounced destruction of the left arytenoid cartilage were determined.

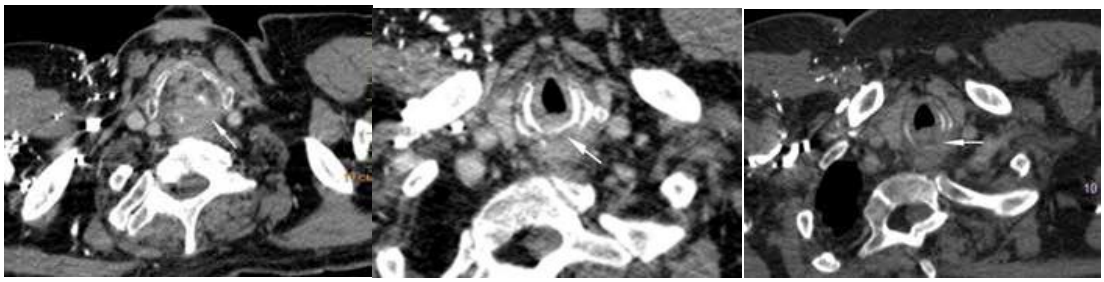

Fig. 2. Axial image, venous phase of multiphase bolus examination: A – volumetric formation of the posterior wall of the larynx (arrow) with compression of the retropharyngeal space, pronounced destruction of the arytenoid cartilages (the lesion of the right cartilage is more pronounced); B – destruction of the plate of the cricoid cartilage (arrow); C – spread of changes to the subclavian part and the cervical part of the trachea (arrow)

The laryngeal lumen is sharply narrowed at the level of changes, the vocal and vestibular folds are edematous, the ventricles of the gort have not differentiated. After intravenous contrast enhancement, there was no significant accumulation of the contrast agent by the altered tissues. Enlarged and pathologically altered lymph nodes in the neck were not detected. The thyroid gland is partially occipital, the gland tissue is of the usual structure and size, without focal formations.

The diagnosis of IgG4-sclerosing disease with isolated laryngeal lesion was established as a result of a comprehensive examination with the exclusion of systemic lesions, determination of the level of IgG4 in blood serum and immunohistochemical examination of histological preparations with staining on plasmocytes secreting IgG4 (Fig. 3).

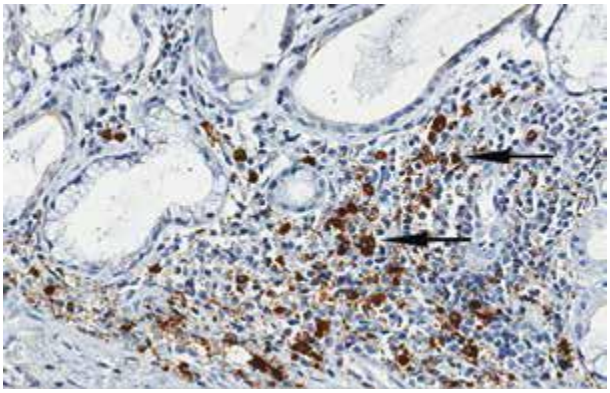

Fig. 3. Immunohistochemical study: immune inflammation with an abundance of plasma cells in infiltrates (arrows) and massive productive fibrosis; there are foci of perivascular fibrosis; infiltrates consist mainly of IgG plasma cells, 73.6% of which are represented by IgG4 cells, which allows us to confirm the diagnosis of IgG4-related sclerosing disease.

After diagnosis, the patient underwent a course of systemic hormone therapy. According to the results of a computed tomography study performed after 9 months, a clear positive dynamics was noted (Fig. 4).

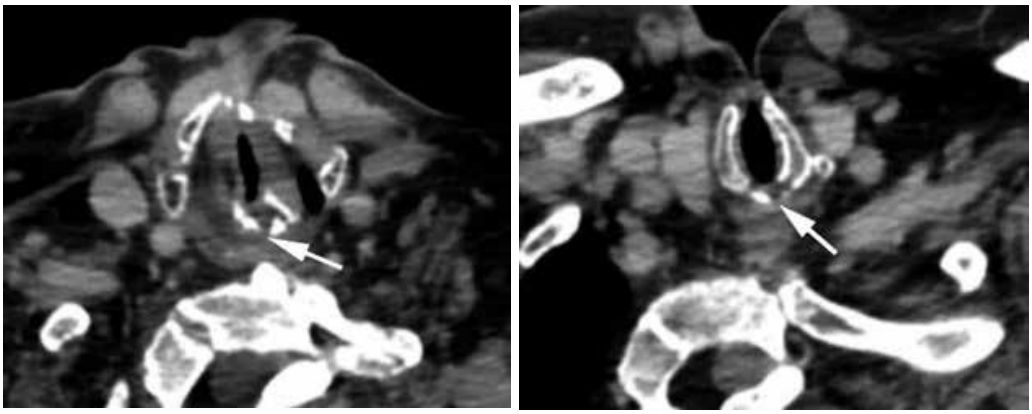

Fig. 4. Axial image, venous phase of multiphase bolus examination, dynamic examination after 9 months: A – volumetric formation of the posterior wall of the larynx significantly decreased in size; fragments of the right and left arytenoid cartilage are determined (arrow). The structure of the laryngeal tissues has increased with a clearer differentiation of fat and muscle elements; B – the structure of the cricoid cartilage has thickened, the volume of the defect of the plate of the cricoid cartilage has significantly decreased in size, its edges are clear and even (arrow).

Currently, the patient has a stable clinical and radiological remission of the disease.

IgG4-sclerosing disease is a new problem in medicine, which necessitates further study and a multidisciplinary approach to diagnosis. From a practical point of view, when detecting a volumetric formation of any localization without infiltrative growth, which does not actively accumulate contrast agent during computed tomography (or magnetic resonance imaging), in case of exception according to the histology of lymphoma or neoplasia, as well as in the detection of fibrosis and lymphoplasmocytic infiltration, it is necessary to assume an IgG4-sclerosing disease and to determine the level of serum IgG4 and immunophenotyping of the biopsy.

Rheumatoid laryngeal lesion Rheumatoid arthritis is a systemic connective tissue disease with a predominant lesion of small joints by the type of erosive–destructive polyarthritis of unclear etiology with complex autoimmune pathogenesis. In the adult population, the disease affects 3% of the population, among children, up to 35 cases per 100 thousand [10]. Rheumatoid arthritis is

characterized by the appearance of inflammatory infiltrates in the synovial membrane of joints consisting of mononuclear cells, mainly T-lymphocytes, as well as activated macrophages and plasma cells, some of which produce rheumatoid factor. Synovial cells proliferate intensively, the synovial membrane swells, thickens, forms outgrowths into the underlying tissues. In addition, extra-articular nodules can form in various organs.

In otorhinolaryngology, the signs and symptoms of rheumatoid arthritis are variable and poorly defined. When the larynx is affected, arthritis of the laryngeal cartilage and rheumatoid nodules in the larynx itself can occur, which, in turn, can cause obstruction of the upper respiratory tract. During the last decades of the last century, the frequency of mountain lesions in rheumatoid arthritis increased from 31 up to 75%, which is most likely due to improved diagnosis; during autopsy, this indicator reaches 90% [11, 12, 13].

Clinically, with arthritis of the cricoid joint, dysphonia, dysphagia, edema of the corresponding region of the larynx is noted; the vocal fold on the side of the lesion is limited in movement or motionless. The fold usually occupies a paramedial or intermediate position. With bilateral arthritis of the peritoneal joints, severe breathing difficulties may occur. When the inflammatory process subsides, the mobility of the vocal fold may remain limited, with the outcome of ankylosis of the joint, its complete inability occurs.

Despite the fact that the incidence of rheumatic laryngeal lesion is quite high, its timely diagnosis is delayed, and in some cases requires a multidisciplinary approach and the use of complex radiation studies. Let's illustrate the above with a clinical example.

Patient G., born in 1978, was admitted to the Oncological Dispensary of the city of Bukhara, Republic of Uzbekistan, with a diagnosis of Neoplasm of the larynx (cyst?). Rheumatoid arthritis". At the time of examination, the patient presented a sting for the sensation of a foreign body, discomfort in the throat, difficulty breathing during physical exertion, snoring. From anamnesis: considers himself ill for a year, when there was a feeling of a foreign body in the throat, hoarseness of the voice. She was treated conservatively. The hoarseness passed, the feeling of a foreign body in the throat persisted. At the primary computed tomography examination of the larynx at the place of residence: in the upper and middle larynx on the right, an additional oval-shaped formation of unequal density, measuring 1.8 × 2 × 1 cm, extending from under the epiglottis to the lower edge is determined thyroid cartilage (fig. 5).

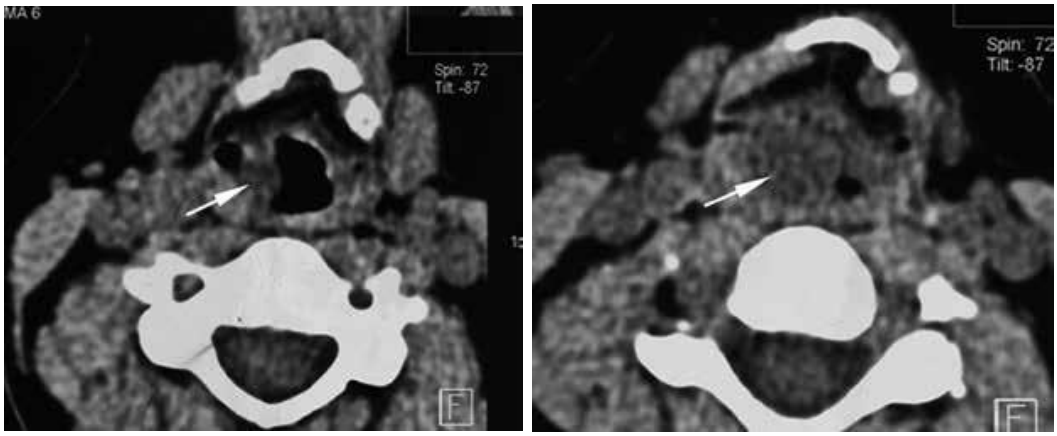

Fig. 5. Computed tomography of the larynx, contrast-free examination, axial images at different levels of the larynx (A, B): in the right scooped fold, an additional formation of reduced density, obstructing the pear-shaped sinus (arrows).

When contacting the Bukhara Regional Oncology Center, fibrolaryngoscopy was performed with a puncture of the formation of the larynx, in which pus was obtained. Diagnosis of "Neoplasm of the laryngopharynx (cyst)" was established, observation at the place of residence was

recommended. However, in otorhinolaryngology, where rigid hypopharyngoscopy was performed under anesthesia with the removal of a neoplasm of the right pyriform sinus (Fig. 6).

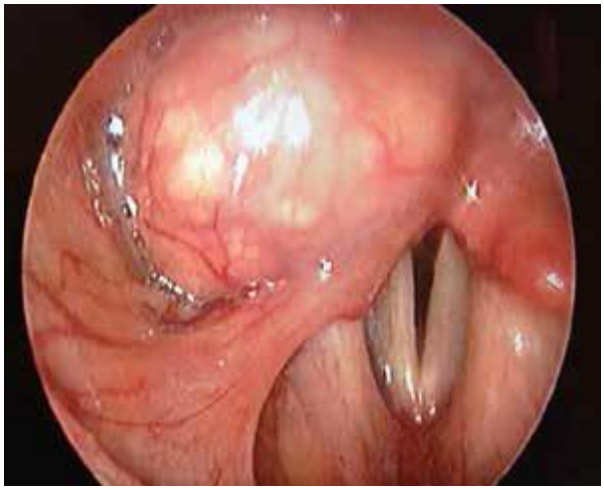

Fig. 6. Endophotography of the larynx: picture of ubmucosal neoplasm of the right pear-shaped sinus.

The formation contained approximately 2 ml of pus, odorless. Histological data: productive inflammation with the formation of granulomas such as rheumatoid nodules with collagen necrosis and cystic transformation. Pronounced xanthomatosis, inflammatory infiltration. The changes are associated with the patient's existing arthritis.

During the control computed tomography, inflammatory changes in the left tibial fold, the left piriform sinus, signs of arthritis of the joint between the body and the great horn of the sublingual bone on the left, the left cricoid joint were determined (Fig. 7).

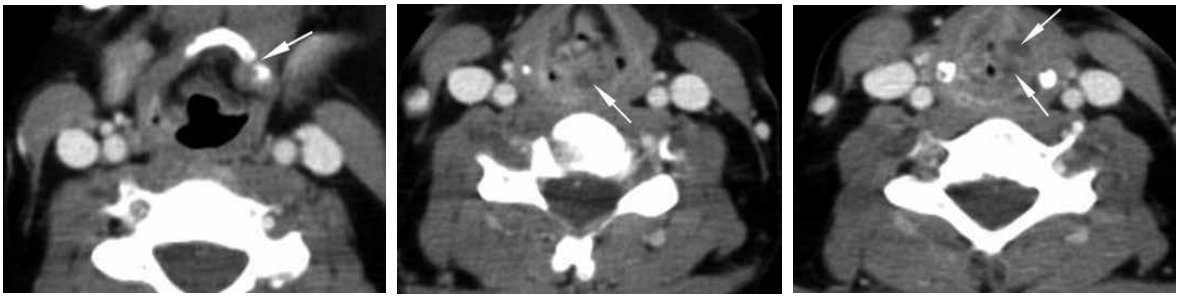

Fig. 7. Computed tomography of the larynx, post-contrast examination, axial images: A– indistinctness and unevenness of the contours of the articular surfaces of the bones forming the connection between the body and the great horn of the hyoid bone on the left (arrow), soft tissues around thickened and compacted; B – a small liquid formation is visualized in the left pear–shaped sinus (arrow); C – the structure of the left vocal fold is compacted, the fold is enlarged in volume with the presence of a small liquid formation, in the projection of the left cricoid joint - also a small liquid formation (arrows).

After correction of treatment and achievement of positive dynamics of the condition, the patient was discharged under the supervision of a rheumatologist and an otorhinolaryngologist at the place of residence.

Laryngeal lesion may be the only current sign of rheumatoid arthritis, accompanied by destructive changes in cartilage and mimic a variety of diseases, both inflammatory and neoplastic. Correctly interpreted computed tomography data should orient the doctor and aim at finding a systemic pathology.

Isolated laryngeal amyloidosis Currently, amyloidosis is called a group of diseases with a wide variety of clinical manifestations caused by systemic or local deposition of fibrillar protein masses in organs and tissues that have a common physical structure, but differ in the chemical composition of the fibrils. Amyloidosis is based on systemic progressive disorganization of connective tissue as a consequence of the synthesis of an abnormal protein - amyloid [14, 15]. The respiratory tract is affected in 50% of patients with primary generalized amyloidosis. Amyloid can be deposited in the vocal folds (sometimes the first symptom of the disease is hoarseness), in the paranasal sinuses, in the pharynx, throat, trachea, bronchi, interalveolar passages, in lung vessels of various caliber. Primary amyloidosis of the respiratory tract is a rare pathology. Diffuse deposition of amyloid is more often observed in the area of the vestibular fold (55%), the ventricle of the larynx (36%), the sublingual space (36%), the vocal cord (27%), the scooped-subgortal fold (23%) and the anterior commissariat (14%) [16, 17, 18,19].

Despite its rarity, laryngeal amyloidosis should be considered an important disease in the differential series of laryngeal lesions. That is why knowledge of the typical radiation pattern of amyloidosis can be useful to a practicing specialist.

Patient O., 60 years old, complained of hoarseness, difficulty breathing during exercise and discomfort in the throat when swallowing. During the 3 months before hospitalization, she noted an increase in shortness of breath, hoarseness, difficulty breathing during physical exertion. The patient was observed by an otorhinolaryngologist at the place of residence, she received general and local anti-inflammatory therapy. Due to the ambiguity of the clinical picture and the lack of effect from conservative therapy, she was referred to the ALFA MEDICAL CENTER clinic in the city of Bukhara. The study of the anamnesis showed that the patient does not associate the occurrence of the disease with anything, no previous, concomitant diseases have been identified, there are no bad habits. In fibrolaryngotracheography, it was noted: the entrance to the larynx is free, the epiglottis is in the form of a petal, vestibular and scooping-laryngeal folds are of the usual color and size, both halves of the larynx are mobile with phonation. At the level of the head of the larynx and the 1st ring of the trachea, a lumpy, yellowish-colored neoplasm with a narrowing of the laryngeal lumen of the I degree is revealed (Fig. 8).

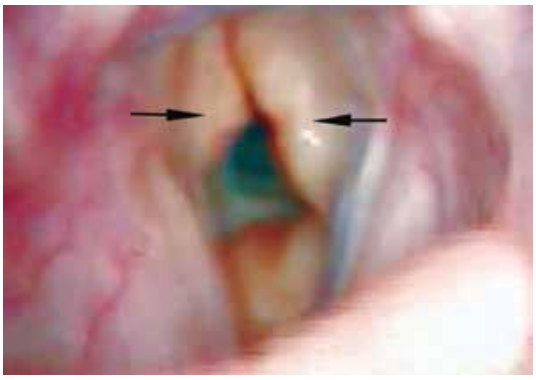

Fig. 8. Laryngeal endophotography: amyloid masses are determined (arrows).

Peripheral lymph nodes are not enlarged. Other ENT organs – without visible pathology.

Under local application anesthesia, a biopsy from the new equipment was taken under the control of a fibrolaryngoscope. The result of histological examination of the biopsy: extensive fields of amyloid deposits. After receiving the histological conclusion, the patient it was fully examined and systemic amyloidosis was excluded.

Based on the obtained data of clinical, histological and instrumental research methods, the diagnosis was made "primary local amyloidosis of the subclavian larynx with a spread to the upper third of the trachea". Surgical intervention was performed: endolaryngeal microsurgery

with the removal of amyloid masses of the throat and upper third of the trachea with the restoration of the air lumen.

The patient was observed without recurrence of amyloid tumor of the larynx and trachea for 4 years after surgical treatment, and computer tomography of the larynx was performed regularly. During the next routine examination, a relapse of the disease was detected. Computed tomography determines the circular infiltration of the subclavian part of the larynx and the cervical part of the trachea. After intravenous contrast enhancement, moderate homogeneous accumulation of the contrast agent by pathological tissue was noted. The intraluminal outlines of the infiltration are clear, bumpy. Destruction of laryngeal cartilage and tracheal rings, no signs of cervical lymphadenopathy were detected (Fig. 9).

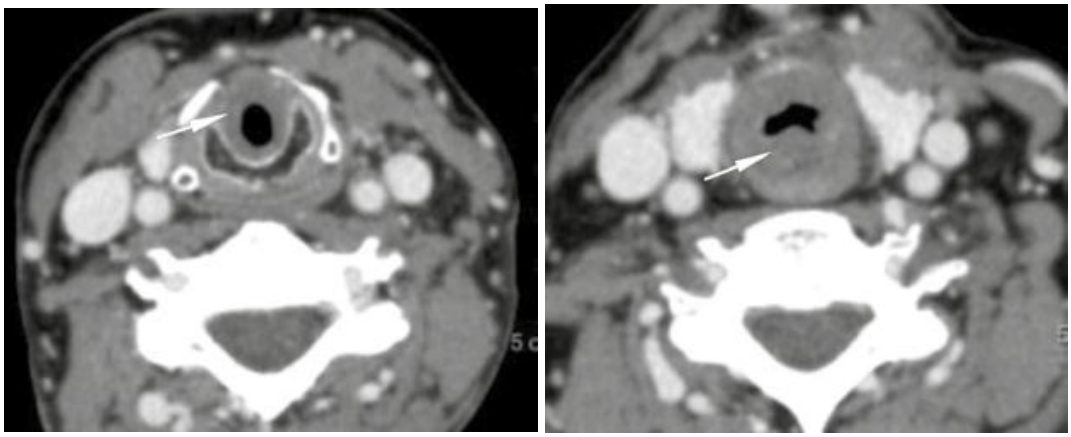

Fig. 9. Computed tomography of the neck, post-contrast examination, axial scans (A, B): circular infiltration of the larynx and trachea (arrows) with narrowing of the lumen. Lack of visualization of regional enlarged and altered lymph node density.

Computed tomography in combination with endoscopic examination can be included in the algorithm of primary diagnosis of amyloidosis, acute and chronic local complications of the disease, as well as used for the specific detection of relapse. The computed tomographic picture of amyloidosis is not specific and is characterized by the presence of a circular submucosal infiltration that moderately accumulates a contrast agent. Amyloidosis should be included in the differential diagnostic series together with granulomatous lesions in tuberculosis, sarcoidosis, Wegener's granulomatosis.

Cervical actinomycosis Actinomycosis is a rare disease caused by gram-positive anaerobic bacteria – representatives of the normal flora of the respiratory tract and digestive tract. Most actinomycetes living in the oral cavity belong to aerobes. In pathological processes, more often of an odontogenic nature, aerobic actinocytes turn into an anaerobic form and, together with other bacteroids, nest in necrotic decay of the tooth pulp, near-root destructive foci, pathological dental pockets with periodontitis, difficult tooth eruption. There are three clinical forms of actinomycosis: cervical, abdominal and pulmonary. Cervical actinomycosis accounts for 50 to 80% of cases. Diagnosis can be difficult due to lack of general knowledge, possible atypical course of the process and non-specific radiological symptoms [20, 21, 22]. Clinically and radiologically, such patients are often assumed to have a tumor process, granulomatous inflammation, tuberculosis or fungal infection [23]. In most cases, the diagnosis is made only by the results of a biopsy [24, 25].

The computed tomographic picture of actinomycosis can have various variants; nevertheless, taking into account the literature data, it is possible to highlight its main features. As a rule, these are solid additional formations with indistinct external contours with signs of invasion and inflammation in the surrounding soft tissues [26]. Actinomycosis is characterized by spreading

through the fascial spaces of the neck. This infiltrative nature of the spread is also inherent in abdominal and thoracic actinomycosis [27, 28]. Another special feature can be considered a relatively homogeneous moderate accumulation of contrast agent with the absence of large necrosis zones and cystic areas. In some cases, small cyst-like areas associated with the histological nature of actinomycosis may be observed in the presence of a central focus of purulent fusion surrounded by granulation tissue and pronounced fibrosis [29].

The observation we present demonstrates a fairly typical clinical and radiological picture of actinomycosis.

Patient K. 45 years old was hospitalized in the department of maxillofacial surgery with a diagnosis of "neck neoplasm". The patient noticed the formation about a month ago, applied to the polyclinic at the place of residence, after consulting a maxillofacial surgeon, he was sent for hospitalization. During rentgen computed tomography of the neck on the right side of its surface, an additional formation was determined, represented mainly by solid tissue with small cystic inclusions. A solid component moderately accumulated contrast preparation. The formation was located subcutaneously, merged with the outer and anterior surfaces of the nodding muscle, its external outlines were indistinct and uneven, the surrounding cell was distinctly infiltrated, edematous. The altered fiber was also detected in the parapharyngeal space and merged with the enlarged right palatine tonsil (Fig. 10).

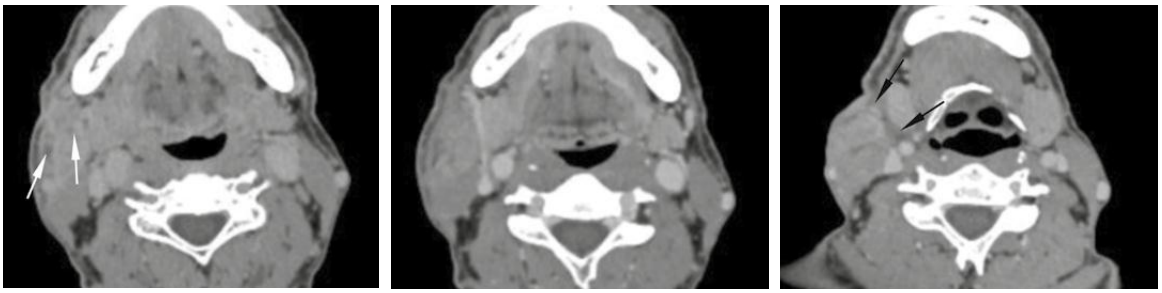

Fig.10. Computed tomography of the neck, post-contrast examination, axial scans (A, B, C): additional formation of the outer surface of the neck on the right, merging with the nodding muscle and skin, with small foci of reduced density in the structure (white arrows) and pronounced infiltrative changes in the fiber around (black arrows).

Localization and other computed tomographic characteristics did not correspond to the manifestations of typical inflammatory or meta-static lymphadenopathy in pharyngeal tumors. Histological verification was recommended. However, the patient quickly developed a clinic of acute inflammation, and he was taken for emergency surgery. The removal of the formation with excision of the neck fiber was performed (Fig. 11).

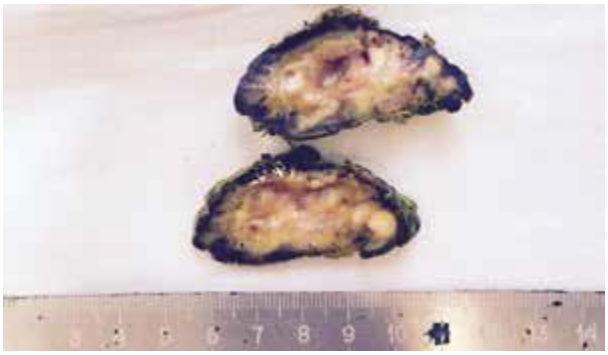

Fig. 11. Macropreparation of remote athological neck formation.

Histologically: signs of chronic abscess, abscessing purulent lymphadenitis with the presence of actinomycetes druses (Fig. 12).

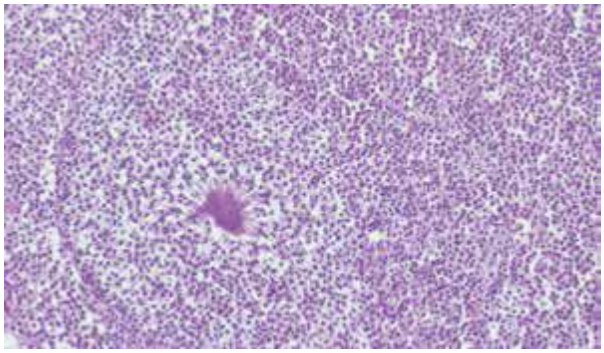

Fig. 12. Micropreparation of a removed chronic abscess, stained with hematoxylin and eosin. In the center – druse actinomycetes.

The postoperative period proceeded without complications, the patient was discharged under the supervision of a dentist at the place of residence.

Actinomycosis should be included in the differential diagnosis when imaging solid formations on the neck or in the larynx that moderately accumulate a contrast agent, especially with a significant inflammatory reaction of the surrounding fiber. Of no small importance are the foci of necrosis and the absence of pronounced reactive cervical lymphadenopathy in solid formations of even large sizes, which is also very characteristic of actinomycosis.

Conclusion

We present diseases of the pharynx and throat of various etiologies with diverse computer tomographic symptoms - IgG4-related sclerosing disease, rheumatoid arthritis, amyloidosis and actinomycosis. However, all these cases are united by some common aspects: the initial suspicion of a tumor process and the absence of typical computed tomographic symptoms characteristic of a tumor lesion (including localization, features of development, the nature of the accumulation of contrast agent, the absence of characteristic lymphadenopathy even with the development process). Despite the statistical rarity, all these diseases must be taken into account in the differential diagnostic series, especially with atypical clinical and rentenological manifestations. A complex multidisciplinary approach can provide a quick and timely diagnosis and treatment of these infrequent, but potentially dangerous pathologic conditions.

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