MORPHOLOGY OF PALATINE TONSILS IN CHRONIC TONSILLITIS IN IDENTICAL TWINS

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ABSTRACT

The work is devoted to one of the actual problems of otorhinolaryngology in the study of morphological changes in the tonsils in the chronic course of inflammation in monozygous twins and to compare them with morphological changes in inflammation of the tonsils in non-twins.

This work is based on studies of a micropreparation of palatine tonsils after tonsillectomy in 12 pairs of identical twins operated in the ENT department of the Bukhara multiprofile children's hospital from 2000 to 2018.The anatomical location of the palatine tonsils and histological studies are described in detail. The results show that after tonsillectomy for chronic tonsillitis in twins and non-twins, as well as between two twins in structure, in the morphometric parameters of the tonsils and in the vascular system, there are no significant differences. In both twins, the picture of the inflammatory process looks the same. and is no different from the tonsils in non-twins.

Keywords. Otolaryngology (ENT), ENT-organs, twins, morphology, biopsy.

RELEVANCE

The problem of health of children born from multiple pregnancies remains relevant related to the course of pregnancy and childbirth, which affects the overall development of the child and the functioning of its organs and systems, and in particular, ENT organs. In addition, twins, compared with single-born children, are more susceptible to the influence of peri-and postnatal pathology, and, therefore, it allows us to study the influence of the latter on the formation and development of organs and systems, including ENT organs and especially Palatine tonsils [4].

The palatine tonsils are anatomically located at the intersection of the respiratory and digestive tracts and are part of the Pirogov-Waldeyer lymphadenoid ring of the pharynx. They are quite often involved in various pathological processes; inflammation of the tonsils is especially common [1,7].

Acute, recurrent and chronic diseases of the palatine tonsils are extremely common in childhood, and the formulations of nosological forms used for their designation are often used in some sources such terms as "angina", "hypertrophy of the palatine tonsils" and "chronic tonsillitis" [2, 3,5,10,11].

Currently, it is generally accepted that the main function of the tonsils, like the entire lymphadenoid pharyngeal ring, is protective. According to a number of researchers, the protective function of the tonsils is usually considered in the context of their active participation in the formation of local and partly general immunity [5,6,8,9,10].

At different times, as medical knowledge accumulated, the tonsils were assigned a variety of functions: from intrasecretory and to the function of the “entrance gate”, when the tonsils were considered as a site of the body for the passage of infection into the body [3,5,6,11].

Based on this, we set ourselves the goal: To study the morphological changes in the tonsils during their chronic inflammation in monozygotic twins and to compare them with morphological changes during inflammation of the tonsils in non-twins.

MATERIAL AND METHODS

The material of the study was pieces of palatine tonsils after tonsillectomy in 12 pairs of identical twins - boys of 10 years of age. The material taken - the pieces were fixed in a 10% formalin solution for 7 days. After fixation, they were washed in running water, and the pieces were carried out with alcohols in increasing concentrations throughout the day. Then the pieces were immersed in a mixture of 96% alcohol and chloroform in a 1: 1 ratio with an exposure of 30 minutes, then in a chloroform solution for 30 minutes and in a chlaraform-paraffin "slurry" in a 1: 1 ratio for an hour in a thermostat at 370C. Then the preparation was kept for an hour on paraffin in a thermostat at a temperature of 56.70C, then it was finally poured into paraffin and blocks were prepared. Dewaxing of the obtained preparations was carried out using xylene, then carrying out to distilled water through alcohols: xylene three times for 10 minutes; 5 minutes each - alcohol 70 degrees, 96 degrees, 100 degrees, twice for 5 minutes, distilled water. At the final stage, background staining with hematoxylin - eosin was carried out, after which the preparations were dehydrated and placed under a cover glass. Histological preparations were examined under an NLCD-307B binocular microscope (Novel, China).

The microscopic structure of hypertrophied, inflamed palatine tonsils was analyzed according to its corresponding histological structure of the state of the layer of lymphoid tissue, vascular bed of lymphoid tissue, trabeculae and capsule and epithelial lining. In the palatine tonsils, attention was paid to the state of the crypts and their contents. During an overview histological examination of the removed palatine tonsils, the state of the integumentary luminal and cryptal epithelium, the state of diffuse and follicular lymphoid tissue were noted.

Mathematical processing of the morphological data obtained in the study was carried out directly from the general matrix of the Microsoft Office software package "Excel 7.0" on a Pentium-IV personal computer using the capabilities of the "STTGRAPH 5.1" program to determine the indices of the standard deviation and representativeness errors.

RESEARCH RESULTS

In healthy children and children with chronic tonsillitis, the palatine tonsils are located between the nasopharynx and the oral cavity. The shape of the palatine tonsil is mainly oval or round in shape, sometimes an oblong and lobular shape is found. The size is determined by the size of the organ peeping out of the tonsillar fossa. The palatine tonsils can be viewed by opening the mouth wide. They are located in the tonsillar niches between the palatine arches. The free surface is directed towards the pharynx, the remaining part is tightly connected to the pharyngeal surface. This type of glands is characterized by the largest sizes.

In the palatine tonsils, the pharynx (inner) and lateral (outer) surface, its upper and lower poles are distinguished.

In the pharyngeal lymphoid tissue forms a layer that contains free lymphocytes and lymphoid nodules, usually with germinal centers. Each amygdala has 10-20 deeply penetrating and epithelium-lined impressions known as crypts. The lumen of the crypts contains desquamated epithelial cells, live and dead lymphocytes. The integumentary epithelium of the tonsils is in contact with the lymphoid tissue over a large extent. Crypts are more developed in the area of the upper pole of the tonsils.

In the lateral surface, a pseudocapsule (false capsule) is distinguished - a dense fibrous connective tissue membrane, the thickness of which fluctuates from 08 to 1.2 mm on average 1.0 mm. The pseudocapsule is formed by the intersection of the plates of the cervical fascia. Between the lateral wall of the pharynx and the

pseudocapsule of the amygdala, there is paratonsillar tissue, which is more developed in the upper pole of the tonsil. The pseudocapsule is absent in the lower pole and on the pharyngeal surface of the amygdala.

In the lateral surface, trabeculae are also distinguished: where, connective tissue fibers depart from the pseudocapsule into the thickness of the tonsils, form a densely looped network and follicles in the amygdala parenchyma: where lymphocytes with plasma cells form a spherical accumulation.

In the area of the upper pole (in the tonsillar niche) there is a triangular depression in the sinus, in which the lymphoid formations are located. The great depth and tortuosity of the crypts in the upper pole often contribute to the onset of the inflammatory process and foci of latent purulent infection. The internal carotid artery is located at a distance of about 2.8 cm from the upper pole of the amygdala, and the external carotid artery is approximately 4.0 cm apart.

Histologically, in healthy children, the palatine tonsil consists of diffuse lymphoid tissue and lymphoid nodules located under the stratified squamous epithelium, which is so densely infiltrated with lymphocytes in many areas that it is difficult to distinguish it.

The lymphoid tissue in these tonsils forms a layer that contains free lymphocytes and lymphoid nodules, usually with germinal centers. The crypt lumen contains desquamated epithelial cells, live and dead lymphocytes. The lymphoid tissue is separated from the underlying structures by a layer of dense connective tissue - the tonsil capsule. This capsule usually acts as a barrier to prevent the spread of infection from the tonsils.

In chronic tonsillitis in identical twins - boys, the tonsils are located between the nasopharynx and the oral cavity. The shape of the palatine tonsil is generally rounded and most of the gland protrudes above the tonsillar fossa. The palatine tonsils can be seen with a slight opening of the mouth. They are located in the tonsillar niches between the palatine arches. The free surface is directed towards the pharynx, the remaining part is tightly connected to the pharyngeal surface. This type of glands is characterized by the largest sizes.

As in healthy children, in children who are not twins and identical twins - boys with chronic tonsillitis in the palatine tonsils distinguish between the yaw (internal) and lateral (external) surfaces, its upper and lower poles. In the pharyngeal lymphoid tissue forms a layer that contains free lymphocytes and lymphoid nodules, usually with germinal centers. Each amygdala contains 8-16 deeply penetrating and epithelium-lined impressions known as crypts. The crypt lumen contains desquamated epithelial cells, live and dead lymphocytes. The integumentary epithelium of the tonsils is in contact with the lymphoid tissue over a large extent. Crypts are more developed in the area of the upper pole of the tonsils.

In the lateral surface, a pseudocapsule (false capsule) is distinguished - a dense fibrous connective tissue membrane, the thickness of which is 0.9-1.3 mm, on average 1.2 mm. Between the lateral wall of the pharynx and the pseudocapsule of the amygdala, there is paratonsillar tissue, which is more developed in the upper pole of the tonsil. The pseudocapsule is absent in the lower pole and on the pharyngeal surface of the amygdala.

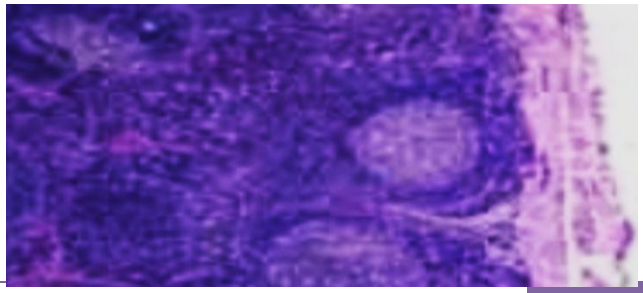

Рис. № 1. Правая небная миндалина больногоЗ . 10 лет, с диагнозом хронический тонзиллит. Утолщение капсулы в области крипты. Лимфоидные узелки набухшие. Видны узелки с герминативным центром. Окраска гематоксилином – эозином. Увеличение ок.10хоб.10.

In the lateral surface, trabeculae are also distinguished: where, connective tissue fibers move away from the pseudocapsule into the thickness of the tonsils, form a densely looped network and follicles in the amygdala parenchyma: where lymphocytes with plasma cells form a spherical accumulation. In the structure of the tonsils, diffuse lymphoid tissue predominated, follicles mostly medium and small. Occasionally, there were single, sparsely located large follicles surrounded by diffuse lymphoid tissue with interstitial sclerosis.

In the area of the upper pole (in the tonsillar niche) there is a triangular depression in the sinus, in which the lymphoid formations are located. The great depth and tortuosity of crypts in the upper pole often contribute to the onset of an inflammatory process and foci of latent purulent infection. The crypts are mostly slit-like. The contours of individual germinal centers looked blurred as a result of the penetration of lymphocytes from the mantle zone into the light zone of the center. The trabeculae are dilated, infiltrated with lymphocytes. Focal infiltrates in the capsule and peritonsillar tissues.

The internal carotid artery is located at a distance of about 2.8 cm from the upper pole of the amygdala, and the external carotid artery is approximately 4.0 cm apart.

In the palatine tonsils there is a thickening and compaction of the capsule and trabeculae, proliferation of connective tissue around the crypts and along the vessels (fibrosis), polymorphism of lymphoid nodules, an increase in their number (they are often located in two rows), sizes (2 times or more - hyperplasia 10 % of nodules), deformity (change from a rounded shape to an oval) with a simultaneous decrease in the number of lymphoid elements and proliferation (suppression of immunopoiesis), especially in large nodules with loosened germinal centers

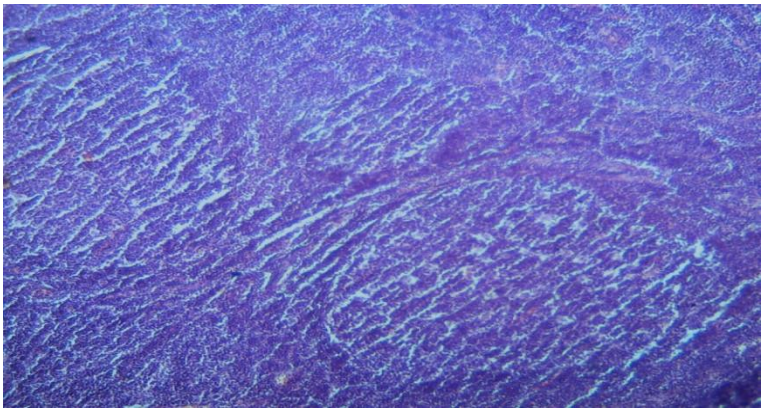

Figure: № 2. The right palatine tonsil of patient X. 10 years with a diagnosis of chronic tonsillitis. Thickening of the connective tissue septa between the lymphoid nodules are visible. Staining with hematoxylin - eosin. Magnification approx. 10 x 10.

The lymphoid tissue is separated from the underlying structures by a layer of dense connective tissue - the tonsil capsule. This capsule usually acts as a barrier to prevent the spread of infection from the tonsils.

Covering luminal epithelium with symptoms of acanthosis, infiltrated with a small number of lymphocytes and segmented leukocytes. There was edema of the luminal epithelium with symptoms of desmolysis of the suprabasal layer of cells and the formation of intraepithelial cysts and blisters.

In the morphology of the palatine tonsils in the study of histological preparations of the palatine tonsils after tonsillectomy for chronic tonsillitis in the structure, in the morphometric parameters of the tonsils and in the vascular system, there are no significant significant differences. In both twins, the picture of the inflammatory process looks the same. They do not differ from the picture of inflammation of the palatine tonsil in non-twins.

CONCLUSIONS

In chronic inflammation of the palatine tonsils, diffuse lymphoid tissue predominates in the structure of the tonsils, the follicles are mostly medium and small. Occasionally, there are single, sparsely located large follicles surrounded by diffuse lymphoid tissue with interstitial sclerosis.

In chronic tonsillitis in twins and non-twins in the palatine tonsils there is a thickening and thickening of the capsule and trabeculae, proliferation of connective tissue around the crypts and along the vessels, there is an increase in lymphoid nodules and their size, deformation (change from a rounded shape to an oval) with a simultaneous decrease in the number of lymphoid elements and proliferation (suppression of immunopoiesis), especially in large nodules with loosened germinal centers.

It was found that after tonsillectomy for chronic tonsillitis in twins and non-twins, as well as between two twins in the structure, in the morphometric parameters of the tonsils and in the vascular system, there are no significant significant differences. In both twins, the picture of the inflammatory process looks the same. They do not differ from the picture of inflammation of the palatine tonsil in non-twins.

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