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Morphological Features of Middle Neck Cysts

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ABSTRACT

Background. *According to scientific literature sources, neck cysts are a pressing problem in the field of maxillofacial surgery, with special attention paid to the sources of their development and morphological features. At the same time, the opinions of specialists about the mechanism of occurrence and the place of occurrence of this pathology in patients of different ages differ. In order to study the structure of the cyst walls, the article analyzes preparations made from postoperative biopsy materials. The results obtained were compared with scientific literature sources.*

Methods. *Nine patients with branchiogenic cysts were evaluated. Preparations stained with hemotoxicity and eosin were prepared from these tissues. Preparations were examined microscopically.*

Results. *According to the results of our research, branchiogenic cysts make up 13.6% of neck and jaw tumors. Dystrophic changes of single-row flattened epithelial cells can be seen in purulent cysts, and areas of their desquamation were identified in the epithelial layer itself.*

Conclusions. *Morphological studies, the histological structure of neck side cysts generally corresponds to the information presented in scientific literature sources, but in some cases it can be seen that its inner surface consists of multi-layered flat epithelium. In order to prevent the development of the disease, it is necessary to make an early diagnosis. BC is characterized as a tumor transformation of the normal epithelial lining of the cyst.*

Key words: *median cyst of the neck, ectoderm, endoderm, branchiogen.*

INTRODUCTION

Side cyst of the neck is considered the most common congenital anomaly of the neck, accounting for 75% of congenital neck formations. It is followed by scrotal anomalies (24%), in which scrotum anomalies occur in different locations.

Cysts are midline cervical cyst or its drainage in the area of the anterior midline of the neck, and can meet the lateral cyst of the neck from the palatine tonsil to the anterior edge of the thoracolumbar junction. Lateral neck cyst (congenital lateral neck cyst, traumatic cyst, branchiogenic cyst, lymphoepithelial lateral cyst) accounts for 25% of all soft tissue cysts of the maxillofacial area and neck.

There are still different views on the etiology and pathogenesis of cervical cysts and fistulas. In addition, Uzbek scientists studied the unusual condition of bronchial obstruction with a foreign body.

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The article describes the specific characteristics of the unique clinical morphological changes in the lungs and the results of the histological examination of the lung tissue due to the long-term stay of the foreign body in the bronchial tube [6]. According to the branchiogenic theory, its origin is attributed to an abnormality in the development of the scrotum.

Anomalies in the development of the 2nd or 3rd pair of sacral arches are the source of the formation of external neck cysts and neck fistulas.

The inner branchiogenic pockets are formed from the endoderm, and the outer from the ectodermal layer of the embryo. Side cysts of the neck can be of endodermal or ectodermal origin [2, 5, 8].

E.S. King, S.H. According to Bhascar, BYoK is believed to be the result of a disorder in the formation of neck lymph nodes.

Usually, before describing their origin, it is necessary to understand the phylogeny of neck cysts. Starting from the 4th week of pregnancy, the embryo is formed from the joint apparatus consisting of five interconnected pairs of joint pockets, slits and arcs.

More than 90% of branchiogenic defects are caused by anomalies of the second cleft [3]. Its cells move along the ventrolateral plane during fetal development and are the basis for the formation of the maxillofacial area.

If an error occurs during the growth of the fetus, then one of the consequences may be the formation of a cyst or a fistula. The basis of the cyst is the ectoderm, and the fistula is formed by the endoderm corresponding to the pharyngeal pocket [2,3,4].

In recent years, another etiomorphogenesis of lateral neck cysts has been proposed.

According to some authors, congenital cysts of the neck appear due to the improper formation of the neck lymph nodes, that is, the penetration of epithelial tissue elements, in particular, into the salivary glands (in the embryonic period). According to the authors, they refer to clinical and histological data that reliably confirm the lymphoid theory of the origin of neck cysts [1,5,9].

Despite the adequacy of diagnostic methods for congenital neck cysts, sometimes there may be difficulties in differential diagnosis from lymphadenopathy to tumor-like diseases, including malignant neoplasms. It should always be kept in mind, because according to different researchers, the percentage of inconsistency between clinical and pathogistological diagnoses of congenital cysts and neck fistulas ranges from 20 to 63% [2,4,8].

The purpose study of the histological structure of cysts obtained from patients with lateral and median cysts of the neck.

MATERIALS AND METHODS

From 2019 to 2023, we examined the biopsy materials obtained after the surgery of patients who underwent surgery with the result of neck-jaw areas admitted to the Central Military Clinical Hospital of the Ministry of Defense in the period from 2019 to 2023.

The age of the patients is from 21 to 41 years. All of them are male. Histological examination of these patients was performed by staining the biopsy material with hematoxylin-eosin.

	Branchiogenic character	Lymphoepithelial character
Place of origin	Remnants of the trauma apparatus on or above the thoracolumbar muscle	Lymph node development defect, salivary gland
Histological structure	Multilayered squamous epithelium, sometimes multinucleated ciliated (mertsatel) epithelium.	Multilayered squamous epithelium. The presence of lymphoid tissue and follicles. The presence of gassal bodies and sebaceous glands.

In some examined sections, a multi-layered flat epithelial structure (epidermis) and a dermis layer can be seen on the surface. In one cross-section, an intact area of the epidermis is visible, and its wall is composed of granulation tissue, and a complex structure of cells with partially thickened epidermoid epithelium and squamous epithelium is visible on the surface. The wall of this cystic area and foci of granulation tissue have penetrated to the deep tissue layer, that is, to the connective tissue layer, sometimes fibrous tissue with foci of different density and thickness is visible on the wall, sparse and diffuse lymphohisticytic infiltrates are also visible. One cross-section shows an area of the deep connective tissue cyst wall with a surface composed of prismatic epithelium.

RESULTS

In other examined sections, the cystic tissue consists of a flat epithelial structure, fibrous tissue of different density and thickness, sometimes fibrous structures of connective tissue are unevenly fibered. The lining of the inner wall is preserved in almost all sections and is composed mostly of epidermoid epithelium, in some areas it is somewhat flattened, the layers are mainly spiny and consist of flat cells in the basal layer, their nuclei are oval in shape, unevenly stained with hyperchrome, and the cytoplasm is unevenly eosinophilic. In some sections, multi-layered mertsatel epithelium is visible (see Fig. 2).Sometimes in the cyst wall with fibrous

tissue there are clusters of cells consisting of focal fibrohistiocytes, unevenly located small blood vessels, under the subepithelial layer focal and diffuse lymphoid tissue and field lymphoid infiltrates are visible in the optical field. In some areas, foci of hemorrhage are observed, follicle vessels and interstitial tissue are swollen, blood vessels are full and dilated. In some sections, among the lymphoid tissue, structures typical of thyroid gland follicles can be seen, and there is a colloid substance in the cavity. The cell composition of lymphoid tissue is composed of small and medium-sized lymphocytes, histiocytes, and plasma cells, sometimes with an admixture of granulocytes (see Fig. 1).

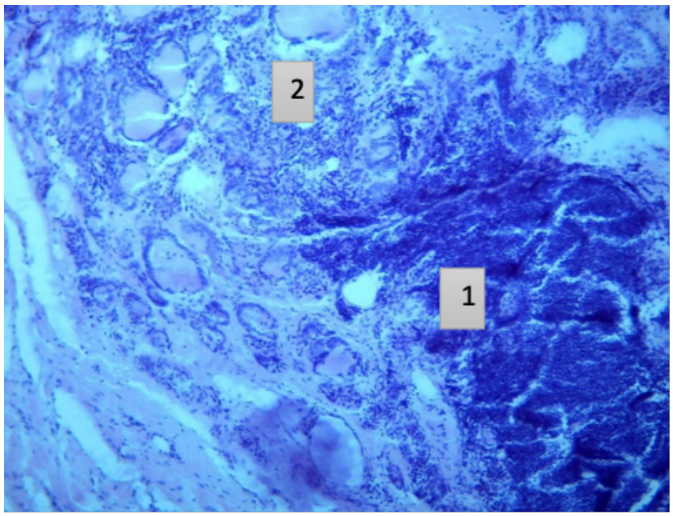

Figure 1. Morphological structure of neck cyst. Hematoxylin-eosin stain. Objective 40x. 1- Notex and sparse lymphoid follicles. 2. Remains of thyroid gland structures

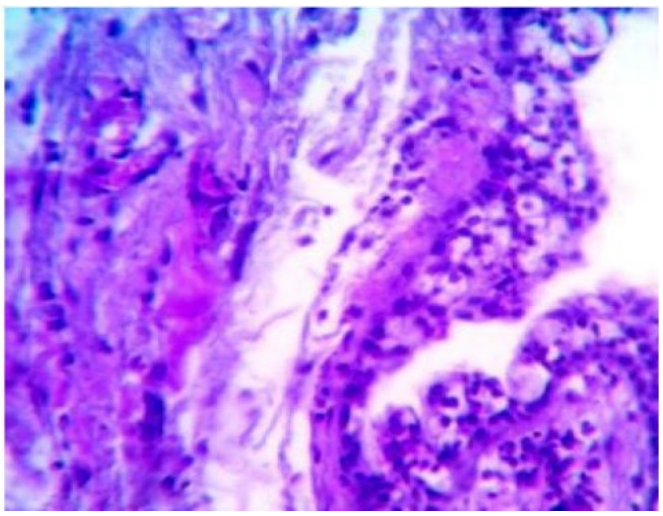

Figure 2. Multi-row floating (mersatel) epithelium, with vacuolization of epithelial cytoplasm

According to the results of our research, branchiogenic cysts make up 13.6% of neck and jaw tumors. Dystrophic changes of single-row flattened epithelial cells can be seen in purulent cysts, and areas of their desquamation were identified in the epithelial layer itself. Thus, in almost half of the patients with neck side cyst, we can think about the lymphoepithelial origin of the neck side cyst without doubt, and by this, determining the parameters of differential diagnosis of neck side cysts and early assessment of the type of these pathologies is a practical instruction for doctors and surgeons. A noticeable increase in the volume of lateral neck cysts in a relatively short time can be observed with reactive hyperplasia of the lymphoid tissue present in their walls [5, 7].

In some cases, the cysts have a flat epithelial structure, and consist of fibrous tissue, with different density and thickness, sometimes fibrous structures of connective tissue are unevenly fibered. The surface of the inner wall is preserved in almost all sections, mostly composed of epidermoid epithelium, somewhat flattened in some areas, the layers are mainly spiny and flat cells in the basal layer. Their nuclei are oval in shape, unevenly stained with hyperchrome, the cytoplasm is unevenly eosinophilic [5]. In some sections, a multi-row mertsatel epithelium is visible. Sometimes in the cyst wall with fibrous tissue there are clusters of cells consisting of focal fibrohistiocytes, unevenly located small blood vessels, under the subepithelial layer focal and diffuse lymphoid tissue and field lymphoid infiltrates are visible in the optical field. In some sections, foci of bleeding are observed. In some sections, among the lymphoid tissue, structures typical of thyroid gland follicles can be seen, and there is a colloid substance in the cavity.

DISCUSSION

Today, there are various disagreements among scientists, and the histogenesis of congenital lateral and medial neck cysts is not fully understood. Some authors believe that they are formed from the remnants of traumatic fractures associated with embryonal dysplasia of germinal tissue [8,9]. Areas of mesenchyme located between the sacs and grooves grow to form elevations called branchial arches located on the anterior surface of the embryonic neck. During the development of the human embryo, the 4th and 5th gill arches, the 4th gill sac, the 2nd, 3rd, 4th and 5th slits are shortened. During the process of embryogenesis, in the 3-5th week, cartilage is transformed into different forms of the facial parts of the head and neck, at this time a slowdown in contraction leads to the formation of closed cavities. The researchers who put forward this hypothe-

sis believe that the cause of cysts lies in the improper formation of lymph nodes in the upper third of the neck. Lateral cysts are located directly on the neurovascular bundle of the neck at the level of the bifurcation of the common carotid artery. As a rule, lateral neck cysts do not cause any particular inconvenience to the child. Only with significant enlargement or suppuration can they make it difficult to eat, cause pain, putting pressure on the neurovascular bundle of the neck. Lateral neck cysts may suppurate. In these cases, the cyst quickly increases in volume due to the accumulation of purulent exudate in its cavity, and becomes painful and dense to the touch. The lymph nodes of the neck become enlarged and palpation becomes painful. Pathological anatomy.The wall of the lateral cyst consists of dense fibrous connective tissue lined with stratified squamous non-keratinizing epithelium (ectodermal origin) or multirow columnar epithelium (endodermal origin of the cyst). In the thickness of the membrane there is lymphoid tissue in the form of follicles [3, 4, 9].. The patient we examined was found to have lateral neck cysts. In most cases, all lateral neck cysts were single, ranging in size from 2.0 x 0.6 to 7.0 x 4.5 cm, and had a round shape. Histological examination revealed the growth of keratinizing squamous cell carcinoma in the wall of the branchioma in 3 cases. In 4 cases, the formation of lymphoid follicles with growth centers was noted. In one lateral neck cyst, a space filled with hemorrhagic contents was found between fibrous tissues. Histological examination revealed a clear increase in connective tissue and focal columnar perivascular lymphoplasmatic infiltration in 2 cases; in other fields of view, adipose tissue infiltrated with blood and muscle tissue. The patients had a discrepancy between the clinical and pathological diagnosis.

CONCLUSIONS

The reviewed observations show that lateral neck cysts can manifest themselves clinically not only at a young age (21 and 41 years in our observations), but also later in life (after 40 years in this case). According to the results of our study, neck side cysts make up 13.6% of tumors of the neck and jaw area. Morphological studies, the histological structure of neck side cysts generally corresponds to the information presented in scientific literature sources, but in some cases it can be seen that its inner surface consists of multilayered flat epithelium. Flattened epithelial cells located in a row in purulent cysts in many cases showed signs of dystrophic changes, and their desquamation sites were identified in the epithelial layer itself. Yehuda et al. 13 found that 3-24% of lateral neck cysts are associated with benign tumors, but this percentage increases to 80% in patients older than 40 years. Most of them are represented by metastatic lymphadenopathy of primary tumors of other areas of the head and neck, but until this is proven, BC should be suspected. In order to prevent the development of the disease, it is necessary to make an early diagnosis. BC is characterized as a tumor transformation of the normal epithelial lining of the cyst. Chronic inflammation and radiation may cause degeneration or development of this tumor, but its etiopathogenesis remains unclear. According to Martin et al., the diagnosis of BC can be confirmed if each of the following criteria is met: the location of the tumor along the line anterior to the sternocleidomastoid muscle; b. the histological appearance of the tumor corresponds to the tissues in the cornea; c. clinical course of the disease, primary tumor does not appear during the 5-year follow-up period after diagnosis; d. Histological evidence of cancer development in the epithelial-lined cyst wall on the lateral side of the neck.

Conflict of Interest – The authors agree to publication.

Ethical aspect – Data and materials are available. The authors have no interests.

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BRANXIOGEN KISTANING O‘ZIGA XOS MORFOLOGIK XUSUSIYATLARI

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ABSTRAKT

Dolzarbligi. Ilmiy adabiyot manbalariga ko‘ra, bo‘yin kistalari yuz-jag‘ jarrohligining dolzarb muammosi bo‘lib, ularning rivojlanish manbalari va morfologik xususiyatlariga alohida e’tibor beriladi. Shu bilan birga, turli yoshdagi bemorlarda ushbu patologiyaning paydo bo‘lish mexanizmi va paydo bo‘lish joyi to‘g‘risida mutaxassislarning fikrlari farqlanadi. Branxiogen kista devorlarining tuzilishini o‘rganish uchun operatsiyadan keyingi biopsiya materiallaridan tayyorlangan preparatlar tahlil qilindi. Olingan natijalar ilmiy adabiyot manbalari bilan solishtirildi.

Usullari. Branxiogen kistalari bo‘lgan to‘qqiz nafar bemor o‘rganildi. Tekshiruvga taqdim qilingan kista to‘qimalaridan gemotoksiklik va eozin bilan bo‘yalgan preparatlar tayyorlandi. Preparatlar mikroskopik tarzda tekshirildi.

Natijalar. Tadqiqotlarimiz natijalariga ko‘ra, bo‘yin yon kistalarining 13,6 foizini branxiogen kistalar tashkil qiladi. Yiringli kistalarda bir qatorli yassi epiteliy hujayralarining distrofik o'zgarishlarini ko'rish mumkin, epiteliy qatlamining o'zida esa ularning deskuamatsiya joylari aniqlanadi.

Xulosa. Morfologik tadqiqotlar, bo'yin yon kistalarining gistologik tuzilishi odatda, ilmiy adabiyot manbalarida keltirilgan ma'lumotlarga mos keladi, ammo ba'zi hollarda uning ichki yuzasi ko'p qavatli yassi epiteliyadan iborat ekanligini ko'rish mumkin. Kasallikning rivojlanishiga yo'l qo'ymaslik uchun erta tashxis qo'yish lozim boladi. BYO kistaning normal epiteliy qoplamining o'simta o'zgarishi sifatida tavsiflanadi.

Kalit so‘zlar: bo‘yin yon kistasi, ektoderma, endoderma, branxiogen kista.

МОРФОЛОГИЧЕСКОЙ ХАРАКТЕРИСТИКИ БРАНХИОГЕННОЙ КИСТЫ

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АБСТРАКТ

Актуальность. По данным научной литературы, кисты шеи являются актуальной проблемой в области челюстно-лицевой хирургии, при этом особое внимание уделяется источникам их развития и морфологическим особенностям. При этом мнения специалистов о механизме возникновения и месте возникновения данной патологии у пациентов разного возраста различаются. С целью изучения строения стенок кисты в статье анализируются препараты, изготовленные из материалов послеоперационной биопсии. Полученные результаты сравнивались с научными литературными источниками.

Методы. Обследовано девять пациентов с бранхиогенными кистами. Из этих тканей готовили препараты, окрашенные гемотоксичностью и эозином. Препараты исследовали микроскопически.

Полученные результаты. По результатам нашего исследования кисты шейной стороны составляют 13,6% опухолей шейно-челюстной области. Морфологические исследования, гистологическое строение кисты шейной стороны в целом соответствуют сведениям, представленным в научных литературных источниках, однако в ряде случаев можно увидеть, что ее внутренняя поверхность состоит из многослойного плоского эпителия.

Заключение. Морфологические исследования, гистологическое строение боковых кист шеи обычно соответствуют сведениям, представленным в научно-литературных источниках, однако в ряде случаев можно увидеть, что внутренняя поверхность ее состоит из многослойного плоского эпителия. Чтобы предотвратить развитие заболевания, необходимо провести раннюю диагностику. БК определяется как неопластическая трансформация нормальной эпителиальной выстилки кисты.

Ключевые слова: срединная киста шеи, эктодерма, энтодерма, бранхиоген киста.