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TERATOMAS: FEATURES OF THE MORPHOLOGICAL STRUCTURE AND LOCALIZATION

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Teratomas are formations from different tissues of the human body which are derivatives of one, two or three germ layers. Teratomas, particularly in the form of mature dermoid cysts, are quite common formations, mainly in the sacrococcygeal region and ovaries. Dermoid cysts of other locations are rare. In this article the authors provide a brief analysis of the morphological features of teratomas and describe a case of rare localization of dermoid cysts in the brain revealed during their practice and diagnosed by histologic examination of surgical specimens. The authors hope that this finding will be interesting and useful not only for neurosurgeons and pathologists, but also for other physicians.

Key words: *teratomas, morphology, dermoid cyst, brain.*

ТЕРАТОМИ: ОСОБЛИВОСТІ МОРФОЛОГІЧНОЇ БУДОВИ ТА ЛОКАЛІЗАЦІЇ

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Тератоми становлять утворення з різних тканин людського організму, які є похідними одного, двох або трьох зародкових листків. Тератоми, особливо зрілі у вигляді дермоїдної кісти, є досить частими утвореннями, що локалізуються переважно в крижово-куприковій ділянці та придатках. Дермоїдні кісти інших локалізацій трапляються доволі рідко. У цій статті авторами наведено короткий аналіз морфологічних особливостей тератом і описано випадок із власної практики рідкісної локалізації дермоїдної кісти головного мозку, яка була діагностована в результаті гістологічного дослідження операційного матеріалу. Автори сподіваються, що це спостереження буде цікавим і корисним не лише нейрохірургам і патологоанатомам, а й лікарям інших спеціальностей.

Ключові слова: *тератоми, морфологія, дермоїдна кіста, головний мозок.*

ТЕРАТОМЫ: ОСОБЕННОСТИ МОРФОЛОГИЧЕСКОГО СТРОЕНИЯ И ЛОКАЛИЗАЦИИ

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Тератомы представляют собой образования из различных тканей человеческого организма, которые являются производными одного, двух или трех зародышевых листков. Тератомы, особенно зрелые в виде дермоидной кисты, являются довольно часто встречаемыми образованиями преимущественно в крестцово-копчиковой области и придатках. Дермоидные кисты других локализаций встречаются довольно редко. В данной статье авторами приведен краткий анализ морфологических особенностей тератом и описан случай из собственной практики редкой локализации дермоидной кисты головного мозга, диагностированной в результате гистологического исследования операционного материала. Авторы надеятся, что данное наблюдение будет интересно и полезно не только нейрохирургам и патологоанатомам, но и врачам других специальностей.

Ключевые слова: *тератомы, морфология, дермоидная киста, головной мозг.*

Teratomas are formations from different tissues of the human body which are derivatives of one, two or three germ layers [1]. During fetal development, due to unknown reasons these tissues are isolated in places that are not typical for the organs and also anatomical areas in which the tumor normally develops. Teratomas may include not only the rudiments of a variety of tissues (histioid teratomas), but also organs and groups of organs (organoid and organismoid) [4, 7].

Nowadays, most authors concur that the teratomas or dysembriomas represent tumors from the group of cluster germ cell tumors [2].

The entire heterogeneous groups of teratomas are divided into different classifications with a different number of forms (variants). But in all classifications they are divided into mature and immature teratomas with malignancies [6].

In mature teratomas, derivatives of germ layers can differentiate up to very impressive and even

artistic levels described as "fetus in the fetu". Mitotic activity in them is either absent or only slightly expressed. The most common ectodermal components in them are the skin, brain, and choroid plexus. Mesoderm is most commonly represented by cartilage, bone, fat and muscle (smooth and striated) tissue and endoderm is represented by cysts lined with respiratory and intestinal epithelium, and sometimes parts of the pancreas and liver.

Immature teratomas are represented by embryonic tissues. In the testes, this is fatty tissue from lipoblasts, often with mucus formation, glands of intestinal type, immature spindle cell stroma, and sometimes defective hepatic septa, neuroepithelium, immature elements of the kidneys and lungs. In the central nervous system there is the development of primitive neuroectodermal structures, such as medullary neuroepithelium (up to the formation of rosettes, tubules, simulating the developing neural tube), the retina (or melanocytic neuroepithelium) and formation of the vascular plexus. Immature teratomas are characterized by hypercellularity and increased mitotic activity of "stroma" resembling embryonic mesenchyme. They express the possibility of transformation to mature teratomas with fully mature tissue and organ differentiation. However, immature teratomas rapidly grow, are widespread and have a poor prognosis.

The latest W. H. O classification separately allocated "teratoma with somatic type of malignancy or teratoma with malignant transformation". In this case we are talking about specific teratomas, which contain a component of malignant non-germinal cell fragment. This component is most often represented by rhabdomyosarcoma or undifferentiated sarcoma, and seldom represented by squamous cell carcinoma or adenocarcinoma of the intestinal type.

Monodermal and highly specific teratomas which include components of carcinoid, primitive neuroectodermal tumor, and testicular or ovarian struma with both normal and malignant tissue from the thyroid gland are separately identifiable [2, 4, 6].

In some cases there is a combination of mature and immature teratomas [7].

Among all teratomas, the most common is the mature teratoma, and the most common variant of mature teratoma is a dermoid cyst, or dermoid. The term "dermoid" was given by English veterinarian I. Leblane (1831) who first discovered a cyst with a skin-like capsule containing pasty mass and hair in the brain of a horse. In domestic literature dermoid cyst in humans was first described by L. Buinvil in 1889 [2].

Description of various localizations of dermoid cysts exist in literature, some of which are: ovaries, testes, sacrococcygeal region, mediastinum, retroperitoneum, the bottom of the mouth in the midline, under the tongue or in the root of the nose and the upper outer edge of the orbit [1, 2, 5].

Sacrococcygeal dermoids are predominant in newborns and during the first 2 years of life. An increased incidence of ovarian dermoid cysts is observed in humans with ages starting from 15–16-years-old.

According to the statistical analysis of surgical specimens studied in the Pathoanatomical Department of the Municipal Health Care Institution "The Regional Clinical Hospital — The Center for Emergency Medicine and Disaster Medicine" (Kharkiv) for the period from 2007 to 2012, dermoid cysts in the ovaries account for 99.6 % of all dermoid cysts.

Information in literature about localization of dermoid cysts in the brain is extremely rare and described in the majority of cases in infants and children under the age of 10 years. They are found primarily in the pia mater, sometimes in connection with dura mater, even less in the ventricles of the brain and medulla. Most often they are located near the midline supratentorial or cerebellopontine angle [3, 4, 6].

During our practice, we encountered a case of successful removal of a dermoid cyst located on the brain's membranes.

In the neurosurgical department of the Municipal Health Care Institution "The Regional Clinical Hospital — The Center for Emergency Medicine and Disaster Medicine" in January 2013, a 29 year old male patient with severe neurological symptoms was admitted. From the anamnesis we discovered that he was ill since December 2012. After careful examination, a mass lesion (meningioma) of the pole of the left frontal lobe was diagnosed. The Patient underwent surgery — removal of the mass lesion from the left frontal lobe. The postoperative period was uneventful and the patient was released from the hospital in fair condition.

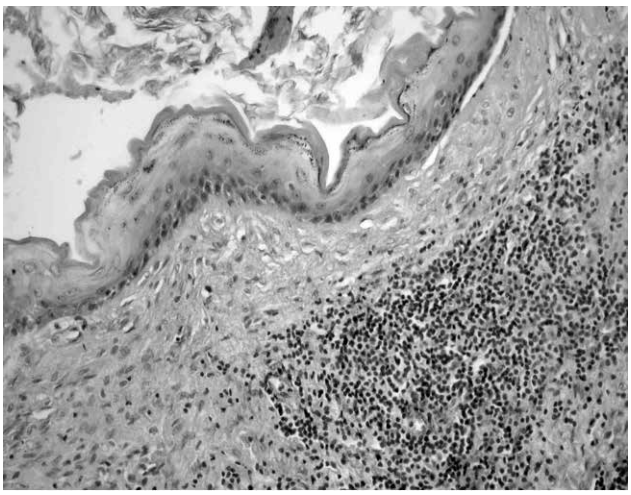

Fig. 1. *Dermoid cyst wall of the brain, lined by stratified squamous epithelium, with well-defined connective tissue wall and inflammatory infiltration in it. In the lumen of the cyst — desquamated epithelium and horny masses. Stained with hematoxylin and eosin, ×200*

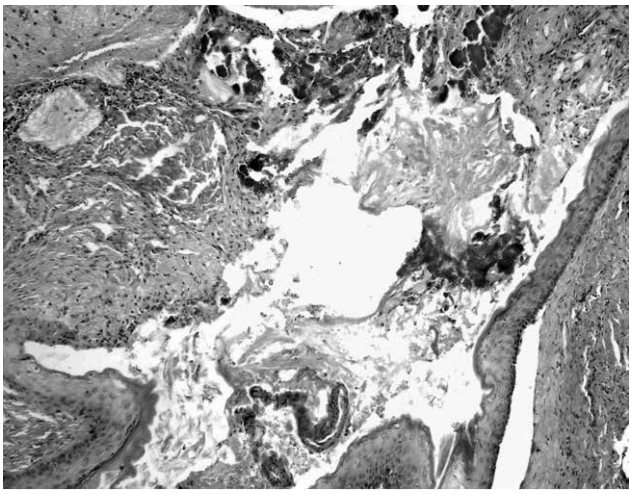

Fig. 2. *The wall of the dermoid cyst of the brain is devoid of epithelial lining. Multiple foci of calcification in the wall of the cyst and in the contents of the lumen. Stained with hematoxylin and eosin, ×100*

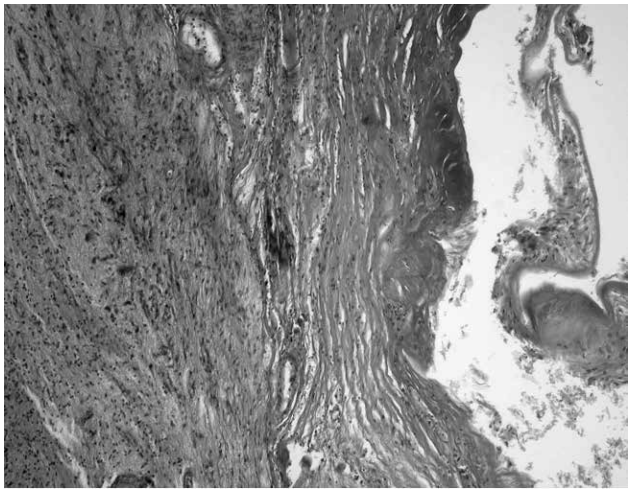

Fig. 3. *Dermoid cyst wall is devoid of epithelial lining, the surface regions of the connective tissue contain some foci of hyalinosis. In the lumen of the cyst — desquamated epithelium and horny masses. Stained with van Gieson, ×100*

The excised biological specimen was sent to the pathoanatomical department for histological examination. Macroscopically, the biological specimen was small whitish-gray pieces of tissue with soft-elastic consistency which does not suggest a dermoid cyst. A microscopic examination of the pieces of brain tissue revealed fragments of a cyst with a well-defined connective tissue wall lined by stratified squamous epithelium (fig. 1). In some areas, the cyst wall was devoid of epithelial lining (fig. 2), and surface regions of the connective tissue contained some foci of hyalinosis (fig. 3). Desquamated epithelium and horny masses were present in the lumen of the cyst (fig. 1) and in the thickness of the cyst wall — solitary hair follicles, sebaceous and sweat glands were present. In the connective tissue on the cyst wall, areas of slight and expressed inflammatory infiltration were noticed (fig. 1), alongside many areas of dystrophic calcification (fig. 2), which, according to the literature, is a typical feature of a dermoid cyst [2]. Microscopic examination revealed that no special features distinguished the dermoid cyst of the brain and dermoid cysts localized in other organs [3].

Thus, in this paper we briefly analyzed the morphological features of teratomas and based on our own practical experience, we also described a case of dermoid cyst localized in the brain of an adult person. This finding is of interest because of the relatively rare localization of the dermoid cyst and also the atypical age group, in which the pathology was identified. We hope that this finding will be interesting and useful not only for neurosurgeons and pathologists, but also for other physicians.

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КАЛЕНДАРНИЙ ПЛАН ХМАПО ПЛАТНИХ ЦИКЛІВ СПЕЦІАЛІЗАЦІЇ Й УДОСКОНАЛЕННЯ ЛІКАРІВ НА 2017 РІК

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