Observation of Clinicopathological Characteristics of Neuroma and Diagnostic Teaching

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Abstract: To explore the clinicopathological features, immunohistochemistry and differential diagnosis teaching of neurological tumors. The neurological tumors were analyzed by literature reports, and their clinical manifestations, imaging features, pathological changes and immunohistochemical markers were observed and analyzed. The clinical manifestations of the patient are headache and occasional seizures. MRI examination showed a cystic disease with clear margins in the right parietal lobe brain parenchyma. The cystic surface showed tiny protrusions, and the capsule was filled with liquid. The cystic surface tumor cells are arranged in a characteristic pseudo-papillary structure with a blood vessel in the center and a single layer or multiple layers of glial fibrillary acidic protein-positive astrocytes. The boundary between the tumor and the normal brain tissue is clear, there is no capsule, and the tumor cells close to the normal tissue are arranged in a patch, and the core-free region structure of the central neurocytoma is locally localized. Individual mesenchymal ganglion cell differentiated cells were seen in the tumor, and no necrosis and mitotic phase were observed. The patient was followed up for 24 months and no tumor recurrence was observed. The tumor is a newly identified neuronal mixed tumor entity, which is a benign brain tumor with a good prognosis.

1. Introduction

With the development of modern imaging and the advancement of experimental techniques, people can more deeply understand and understand the tumors of the nervous system, classify them reasonably and make correct pathological diagnosis [1]. Komori et al first reported and named a neurohumors, which is now considered to be a relatively rare new entity of mixed glial tumors. Since this tumor is a new type of neurological tumor and is rare, pathologists and clinicians are still exploring its prognosis.

Neuroblastoma is a type of neuroblastoma that occurs in the brain parenchyma. Its histological features are similar to those of central neuroblastoma, and the site of the disease is different from that of central neuroblastoma. Central neuroblastoma occurs in the ventricular system and is common in the lateral ventricle and the third ventricle. Extracerebral neuroblastoma can occur anywhere outside the brain of the central nervous system, most commonly in the cerebral hemisphere. The tumor is rare, and there are more than 100 cases reported abroad [2-3]. There are less than 20 cases reported in China, and most of them are reported in small cases or small samples.

Neuronal tumors have biphasic histological features of brain glial cells and belong to WHO class I tumors. The WHO classification of central nervous system tumors is classified as an independent solid tumor, and nearly 70 cases have been reported at home and abroad. This article retrospectively analyzes the clinical and pathological features of extra ventricular neuroblastoma, and explores its clinicopathological features and diagnostic teaching, aiming to improve the level of understanding.

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2. Materials and methods

2.1. Clinical data

The patient had a transient fall before the unknown cause, and the consciousness was unclear. There was no limb twitching and foaming at the mouth. There were 5 episodes in the future, each time with limb convulsions, foaming at the mouth, screaming, apparently unconscious at the time of onset, lasting 1 to 2 minutes, without urinary incontinence, no vomiting, purpura, difficulty breathing, etc. This admission examination: conscious, fluent in language, big scorpion and other large circles, sensitive to light reflection, normal muscle tension in the limbs, physiological reflex can be induced, and pathological reflex is not drawn. MRI showed a spherical lump of the left middle cranial fossa, which was about 21 mm × 29 mm × 27 mm. The flat T_1W_I showed a low signal, and the inside showed a small signal-like signal area. T_2W_I showed a high signal. The signal is separated; after the enhancement, the inside of the mass is scattered in a small piece of sheet-like reinforcement, and most of them have no obvious enhancement. The boundary of the tumor is clear, and the surrounding sac leaves show signs of edema. The left ventricle lower corner is not shown, and the midline has no offset [4]. The cerebral blood vessels showed clear, and no abnormal blood supply was found in the left temporal lobe lesion area. The left lesion of DWI showed a low signal and the ADC map signal increased.

2.2. Method

The tissues were fixed with 4% neutral formalin, embedded in paraffin, 5 μm sections were stained with HE, and immunohistochemical staining was performed for GFAP, Syn, NSE, CgA, Vim, TP53, MIB-1. Antibodies were purchased from Darko. the company. The TP53 and MIB-1 marker indices were positive for brown in the nucleus and were determined by the percentage of positive nuclei on the average of 5 high power fields.

3. Result

3.1. Macro inspection

Case 1 is grayish red crushed tissue with a diameter of 2.6 cm. It is soft and some of the tissues are slightly tough and fine-grained. Case 2 was right temporal lobe resection of brain tissue. The size of the brain tissue was 5 cm *4 cm *3 cm. The cut surface was gray-white with clear demarcation. A cystic lesion with a diameter of 2 cm could be seen in some areas. The wall of the cyst was grey-red and slightly tough. A mural nodule with a diameter of 0.5 cm could be seen in the cyst.

3.2. Microscopic examination

The slice was tumor wall tissue (Figure. 1), with tumor on one side and normal brain tissue on the other. The tumor tissue at the outermost layer of the luminal surface is a pseudo-nipple structure. The center of the nipple is a small blood vessel with a relatively uniform lumen diameter. The tube wall has no obvious thickening and hyaline degeneration. The surface of the nipple is covered with single or multi-layered cells the cells are round or fusiform. The cytoplasm is close to the blood vessels and extends to the blood vessels [5]. The pseudocysts resemble the ependymoma. Tumor cells are scattered. Tumor cells close to normal brain tissue are arranged in a sheet, and the tumor cells are evenly distributed. All tumor cells are relatively uniform in size, with rounded nucleus, medium density of chromatin, and less cytoplasm [6]. Small nucleoli are seen, which resemble central neuroblastoma cells. Locally, there are also nuclear-free areas. Ganglion cell differentiation cells. In addition, some areas see more glial fiber formation, scattered in the typical rosenthal fiber, similar to hairy cell astrocytoma, but the nucleus remains a small round.

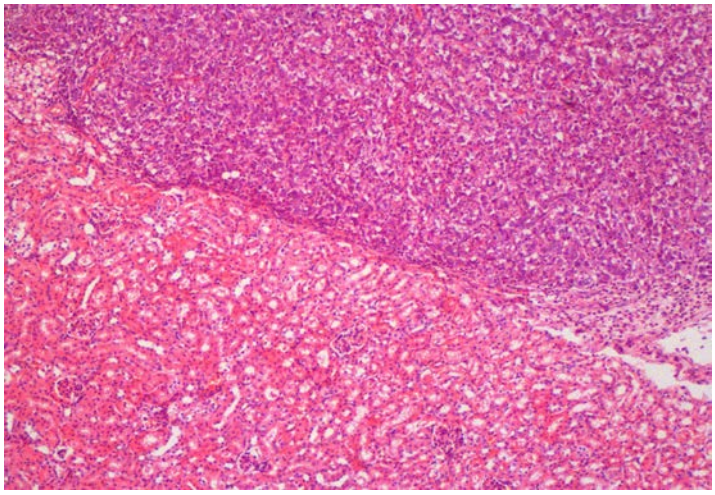

Figure 1 Neuronal tumor HE staining tumor and normal brain tissue under low magnification

3.3. Immunohistochemistry

The cytoplasm and processes of the nipple surface covered cells are *GFAP(+), S-100 (+), Syn(-), NSE(-), CgA(-).* Small round cells between the nipples *Syn(+), NSE(+), S-100(+), GFAP(-).* Ganglion-like cells and ganglion cells *Syn* and *NF(+).* Cell proliferation index *Ki-67 <1%*. (Table 1)

Table.1. Comparison of clinical manifestations and pathology of neurocytoma

Main symptoms	Central neurocytoma		Extracorporeal neuroblastoma		P
Increased intracranial pressure	25	80.6%	3	20.0%	＜0.05
Epilepsy	1	3.2%	5	33.3%	0.018
Compression symptoms	2	6.5%	7	46.7%	0.005
Sporadic	3	9.7%	1	6.7%	1.000
Radiotherapy	16	51.6%	9	60.0%	0.327
Total excision	23	74.2%	9	60.0%	0.592

4. Result analysis

The lesions in all cases of papillary glial neuronal tumors are characterized by neuronal glial lesions of the papillary structure, astrocyte components, and extensive neuronal differentiation, including small nerve cells, medium-sized nerves. Node-like cells and large ganglion cells of the cell body. Its clinical, imaging and histopathology have some common features.

4.1. Clinical features

PGNT is mostly seen in young people. According to 17 reported cases (1-8), the age of onset is 4-75 years old, with an average age of 26.2 years. The majority of cases occur under 40 years old (15/17), of which 7 cases are under 20 years old and 8 cases are between 20 and 40 years old. The general clinical symptoms were mild. The frequency of symptoms was headache (7 cases), epilepsy (5 cases), visual impairment (4 cases), and comprehension impairment (4 cases). The duration of symptoms ranged from one day to two years [7]. 17 cases of lesions were located on supratentorial, the most common location was temporal lobe (6/15), frontal lobe, parietal lobe and parietooccipital lobe were 3 cases each. The size of lesions ranged from 1.5cm to 7cm. Most lesions were located in the periventricular white matter, and also in the cortex and subcortex. Most of the MRI findings

were cystic lesions with relatively clear margins (13/15), solid nodules of large or small size (14/15) in the cystic wall, and enhancement (14/15) after enhancement. Calcification was seen in 4 cases, and no peritumoral edema was found except 1 case. In 17 cases, all the tumors were totally resected except one case with partial excision of the tumors. Follow-up for 3 months to 7 years showed no recurrence or malignancy [6].

4.2. Pathological features

The tumor consists of a characteristic pseudo-nipple and a solid area. The surface of the nipple is covered with a single layer or pseudo-stratified astrocytes. The immunophenotype is positive for GFAP. The center of the nipple is fibrous tissue and blood vessels, with or without hyaline degeneration. The solid area is flaky or locally aggregated and distributed in the fine nerve felt-like matrix, which may be accompanied by mucus degeneration. The size and shape of neurons are different, and most of them are medium-sized ganglion cells. In addition, glioma-like changes may occur in the tumor, which are hairy cell astrocytoma-like or oligodendroglioma-like images, but the tumor cells are not as densely arranged [8]. Other morphological changes include the presence of rosenthal fibers, interstitial hemosiderin deposition, foam cell aggregation, calcification, and lymphocyte infiltration, but no necrosis and cellular atypia, mitotic figures are rare, and MIB-1 marker index is low, suggesting the tumor has a good prognosis, and only one case of recurrence has been reported [9].

4.3. Differential diagnosis

It is mainly a tumor with a papillary structure in the brain tissue. papillary ependymoma: also characterized by the formation of papillary structures, blood vessels in the center of some nipples, the formation of a fake daisy-shaped structure, surrounded by tumor cells GFAP positive. However, the blood vessels in the center of the papillary structure rarely have hyaline degeneration, and there are no neuron-differentiated cells, and most of the ependymoma are positive for EMA. Positive signals often appear along the ependymal glomerular cavity surface, and vimentin is also often positive. This group of EMA were negative, except for one case that broke into the brain, and the rest were located in the brain parenchyma [3]. The binding site, pathological features and immunohistochemistry could exclude ependymoma.

Table 2 Risk factors for recurrence of neurocytoma

	Central neurocytoma		Extracorporeal neuroblastoma	
	Relative risk(95%, confidence interval)	P	Relative risk(95%, confidence interval)	P
Gender	0.505(0.038~6.656)	0.603		
Age	0.999(0.806~1.237)	0.991		
Atypical or not	9.991(1.237~80.675)	0.031	10.683(1.653~69.023)	0.013
Partial resection	10.546(1.147~96.937)	0.037	6.327(1.079~37.080)	0.041
Tumor size	0.867(0.009~80.800)	0.951		
Auxiliary radiotherapy or not	0.524(0.039~7.022)	0.626		

Papillary meningiomas: It is a rare WHO grade III tumor with obvious invasiveness. The tumor is mainly composed of perivascular pseudocysts, with dense cells and easy nuclear division. The cell EMA is strongly positive around the nipple. The tumor is easy to metastasize and relapse. choroid plexus papilloma: The center of the papillary structure is a thin fibrous vascular axis, and the coated cells are crowded, slender or pseudo-stratified (Table 2). The tumor was positive for CK

and vimentin, and the positive rate of GFAP was 25% to 55%. According to the history and immunohistochemistry, CK is positive. If the tumor shows few branch-like cells, it needs to be differentiated from oligodendroglioma, which has no papillary structure and neuron components. There are also ganglion cell gliomas and central neuroblastomas, which are common to neuronal differentiated cells, but often lack papillary structures. Hair cell astrocytoma, embryonic dysplastic neuroepithelial tumors, etc., sometimes thickened and degenerated blood vessel walls, also need to be identified

5. Conclusion

According to the WHO classification criteria for central nervous tumors, PGNT should be a benign tumor of WHOI grade. It has also been reported that tumor cells have high proliferation index, mitotic figures and necrosis in a few cases, suggesting that the tumor may include a higher-level category, not complete. It is a grade I benign tumor. The current treatment method should completely remove the tumor as much as possible. It is not necessary to perform radiotherapy and chemotherapy after surgery. The prognosis is good. The clinical follow-up is 3 months to 7 years. There is no report of tumor recurrence or malignant transformation. PGNT is a new and rare neuron-glial mixed tumor that accumulates more clinical and pathological data, which helps to further understand the tumor and make a correct diagnosis.

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