Research on Imaging Diagnosis of Ganglion Cell Glioma in the Central Nervous System

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Abstract: Objective: This article analyzes 4 cases of ganglion cell glioma and summarizes the imaging performance. Methods: Four patients underwent MR plain scan and enhanced examination before operation. Results There were 4 cases of solid and cystic solid tumors. The solid part showed long or equal T1 length T2 signal, the signal was uneven, and the edges were unclear or clear. Tumors may have irregular or even enhancement after injection. The solid part may have a cyst cavity, calcification or accompanied by bleeding. Conclusion: Glioblastomas of ganglion cells are common in the temporal lobe, cerebellum, frontal lobe, suprasella cisterna and other areas. Temporal lobe tumors with calcification and cystic tumors in the brain should be distinguished from ganglion cell gliomas.

1. Introduction

Ganglio glioma (GG) is a rare primary tumor of the central nervous system, with an incidence of only 0.4% to 0.9% of all intracranial tumors and 1% to 4% of children's nervous system tumors). 80% of GG occurs in young people and children under 30 years old with a history of epilepsy. Because such tumors are rare, most neuroimaging and neurosurgeons lack understanding of them, and most clinical cases are often diagnosed as ordinary gliomas before surgery. With the continuous improvement of pathological diagnosis level and imaging diagnosis technology, GG is gradually recognized by people. Because the prognosis of GG is better than other gliomas, it is of great clinical significance to fully understand the imaging performance of GG. This article retrospectively analyzed the imaging findings of 4 cases of GG confirmed by surgery and pathology to improve the understanding of it.

2. Relevant Research on Ganglion Cell Glioma

Ganglion cell glioma was proposed by Courville in 1930. It refers to a tumor composed of nerve cells and abnormally proliferating glial cell components. Glial cell components can be abnormally proliferating astrocytes, oligodendrocytes or other glial cells or a mixture thereof. In WHO classification, ganglion cell gliomas are tumors of neuroepithelial cells and are classified as type I or II tumors. According to the degree of differentiation of gliocytes in tumors, ganglion tumors can be divided into ganglion cell gliomas, ganglion cell gliomas, ganglion neuroblastomas, atypical ganglion cell gliomas, and neuroblasts tumor. The tumor is gray, yellow, purple, tough, fish-like, and blood supply varies. May have cystic cavity, calcification, intratumoral hemorrhage. Microscopically, the nuclei of nerve cells are of different sizes, well differentiated, without nucleus division, and a few nuclei can be seen in a few nerve cells. Therefore, it is proposed that the ganglion cell glioma patients have congenital structural abnormalities and dysplasia. Histochemical staining showed that there were neuroendocrine particles and cysts in tumor nerve cells. Therefore, the tumor may have endocrine function. There are many opinions on the mechanism of glioma tissue, which can be divided into two theories: congenital brain dysplasia or true tumor. Our research believes that ganglion cell gliomas have neuronal dysplasia and dislocation before the tumor is formed, which is an abnormal embryonic development. On this basis, glioma neoplastic hyperplasia, this hyperplasia stimulates and induces the differentiation of naive neurons to form a true tumor containing nerve cells and glial cells.

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It is reported in the literature that ganglion cell gliomas are more common in adolescents and middle-aged. The cases in this article are mostly seen under 16 years old and the maximum age is 35 years old. Castillo believes that it is more common in young and middle-aged people, and Haddad thinks it is more common in teenagers. This article is similar to haddad statistics. The incidence statistics of men and women are different. There are more men than women in this article. It can be found in various parts of the central nervous system. Mainly located in the temporal lobe, parietal lobe, cerebellum, frontal lobe, can occur in the spinal cord. In this article, there are more tumors in the pore area of the transparent compartment of the suprasellar cistern than in the literature. Epilepsy is the most common symptom. The patient's course is often longer.

Tumor images can be divided into solid and cystic. The MR plain scan of solid tumor showed long or equal T1 long T2 signal, the signal was uneven, the edge was clear or not clear, and irregular enhancement or uniform enhancement could be seen after injection. Often located in the temporal lobe. A cystic cavity (cystic solid) is often seen in the tumor. The parenchyma of cystic tumor may not be obvious, but only cyst. Some are polycystic. After injection, part of the cyst wall was strengthened. May be accompanied by atrophy-like changes in the cerebral cortex around the tumor. Common in the frontal lobe, parietal lobe, cerebellum, etc., tumors are often larger. There is no empty space around the tumor. In this article, 2 cases showed bleeding in the tumor tissue. The solid part of the tumor scanned by CT showed a low-density shadow, the edges were not clear, and the density was uneven. Irregular enhancement can be seen after injection. Calcification can be seen in the tumor. DSA cerebral angiography showed that the capillary and vein tumors were slightly stained, and the supply artery was not obvious. Edema around the tumor is often mild. Ganglion cell gliomas appear more frequently on the image, without significant specificity. It is not easy to distinguish with other tumors in the skull. In this article, one case of astrocytoma of the neck was found to be a glioma of the cerebellar vermis ganglion cells due to weak left limbs. One case of left occipital cystic tumor with epilepsy without trauma history for many years showed no cyst wall enhancement after injection. Same report as Castillo. However, for patients with a long history of epilepsy, CT scan with calcified temporal lobe tumors or large cystic tumors of the brain endothelium, accompanied by abnormal development of the peripheral sulci and gyrus, this disease should be considered and should be related to Lhermitte Duclos disease, ganglia Cell glioma and other gliomas are identified.

Ganglion cell gliomas can be surgically removed or treated with radiation therapy. Haddad, Wolf et al. counted the tumor recurrence rate and the survival time of patients were significantly higher than gliomas. Therefore, it is necessary to identify the diagnosis.

3. Materials and Methods

Information. The clinical data of 4 patients with suspected central nervous system ganglion glioma diagnosed in our hospital were analyzed retrospectively, and all informed consents were obtained and approved by the ethics committee. In this group of investigations, the results of pathological examination: 4 patients with central nervous system ganglion cell glioma.

Inspection method. 4 patients with suspected central nervous system ganglion cell gliomas were all diagnosed by MRI. The specific examination method was: 4 patients were scanned using 3.0T constant-lead MRI scanner produced by General Motors of the United States. SE/T1WI sequence scanning in the morphological, axial and coronal positions, TR is 420ms and TE is 20ms; at the same time, TSE/T2WI flat scanning is performed on it, TR is 4200ms and TE is 120ms. The scanning parameters are set as follows: the layer thickness is 5 mm, the layer spacing is 5 mm, and the scanning field of view is 24 cm×24 cm. Four patients with suspected central nervous system ganglion cell glioma were given intravenous magnevalin (according to the principle of 0.1mmol/kg) to perform an enhanced scan.

Evaluation indicators. The MRI diagnosis results of 4 patients with suspected central nervous system ganglion cell glioma were compared with the results of pathological examination, and the diagnostic effect of MRI diagnosis of central nervous system ganglion cell glioma was analyzed.

Statistical analysis. SPSS21.0 statistical software was used to analyze the MRI diagnosis results

and pathological examination results. The comparison method used the x2 test (counting data). The comparison results were expressed as rates. When P<0.05, the MRI diagnosis results and pathological examination were indicated. There are differences in the results, which are statistically significant; when P>0.05, it means that there is no difference between the MRI diagnosis results and the pathological examination results, and the statistics are meaningless.

The sensitivity of MRI diagnosis of ganglia cell glioma in the central nervous system is 80.00%, the specificity is 83.33%, and the accuracy is 81.25%. Comparing the results of MRI diagnosis with the pathological examination results, the results of the accuracy between groups There is no difference, and statistics are not meaningful (P>0.05).

Table 1 Comparison of Mri Diagnosis Results and Pathological Examination Results

Pathology	MRI	
	Ganglion cell glioma of central nervous system	Ganglia cell glioma of non-central nervous system
Ganglion cell glioma of central nervous system	8	2
Ganglion cell glioma of central nervous system	1	5

4. Discussion

Clinical analysis of ganglion cell gliomas of the central nervous system belongs to a misshapen tumor. The morbidity group is relatively young. The site of the attack is the third ventricle, temporal lobe, and frontal lobe. The incidence is not affected by gender and can affect the patient’s body. Adverse health effects.

Tumor analysis shows that the tumor body is hard, and some patients can see cystic lesions, occasionally calcification, and the tumor can show diffuse infiltrating growth. Therefore, when clinical grading, it is necessary to organically combine tumor pathological results. For most patients with ganglion cell gliomas of the central nervous system, there is no significant histological change, and malignancy may be low. Analysis of the clinical symptoms of patients with ganglion cell glioma in the central nervous system is not significant enough, and the rate of misdiagnosis is high. It may be misdiagnosed as low-grade astrocytoma, viral encephalitis, and so on. MRI diagnosis was given to patients with ganglion cell gliomas of the central nervous system. Most patients showed cystic lesions with multiple single lesions. The T1WI signal showed low or equal signals, and the T2WI signal showed slightly high or high signals. The lesion has mild edema and blurred borders. In some patients, the enhanced scan is conducive to significantly strengthen the nodules. It can be seen that there is no obvious enhancement in the cystic part. Organically combined with the scope of the patient’s tumor, it can be divided into diffuse invasive tumors and masses. Type tumor, there is no significant space-occupying effect, circular necrosis area, small necrosis area or cystic area can be seen inside, the patient is subjected to enhanced scanning, and the patient has mild patchy enhancement and scattered spot enhancement. Analysis of patients with mass tumors has a significant space-occupying effect. In cystic lesions, there are solid wall nodules that present a slightly higher or even higher signal. The enhanced scan is performed to enhance the uniformity and significantly, and the cystic area is strengthened. does not exist. MRI diagnosis is frequently used clinically, and its application in the diagnosis of patients with central nervous system ganglion cell glioma is of higher value, which can significantly reduce the rate of missed diagnosis and misdiagnosis of patients, and can improve the accuracy of clinical diagnosis.

Ganglion cell gliomas of the central nervous system are one of the misshapen tumors. The main incidence group is the group under 30 years old, and the main occurrence sites are the temporal lobe, third ventricle and frontal lobe. There is no obvious difference among women. Some studies have reported that, the tumor body texture is hard, some patients' tumors can see cystic lesions, calcification, and some patients' tumors show diffuse infiltrating growth. Clinically combined with the pathological results of tumors, it is often divided into grades I to II. Most ganglion cell gliomas

have no obvious histological features of alteration, and malignant changes rarely occur. Because the clinical symptoms of this tumor are not significant enough, it is often easy to misdiagnose it as other diseases, such as: viral encephalitis, low-grade astrocytoma, etc. In this study, in order to analyze the clinical value of MRI diagnosis of ganglion cell gliomas in the central nervous system, MRI diagnosis was performed on these patients. The study found that most patients' images showed cystic lesions, and all were single lesions, T1WI Appeared as equal signal or low signal, T2WI showed high signal or slightly high signal, there was mild edema in the local area of the lesion, the boundary was blurred, and some patients underwent enhanced scanning, the nodule was significantly strengthened, and the cystic part was not significantly strengthened.

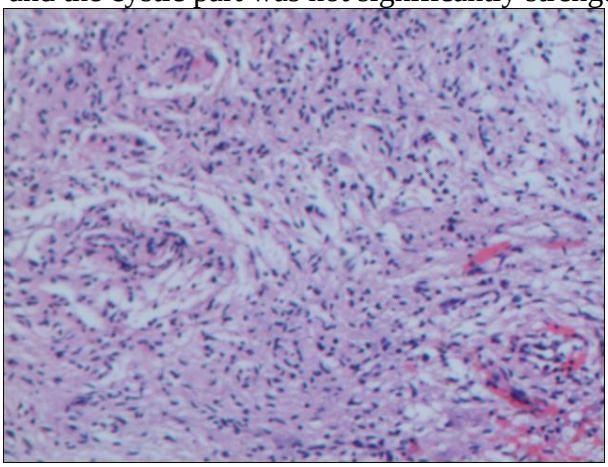

Figure 1 The Pathological Picture of a Young Women

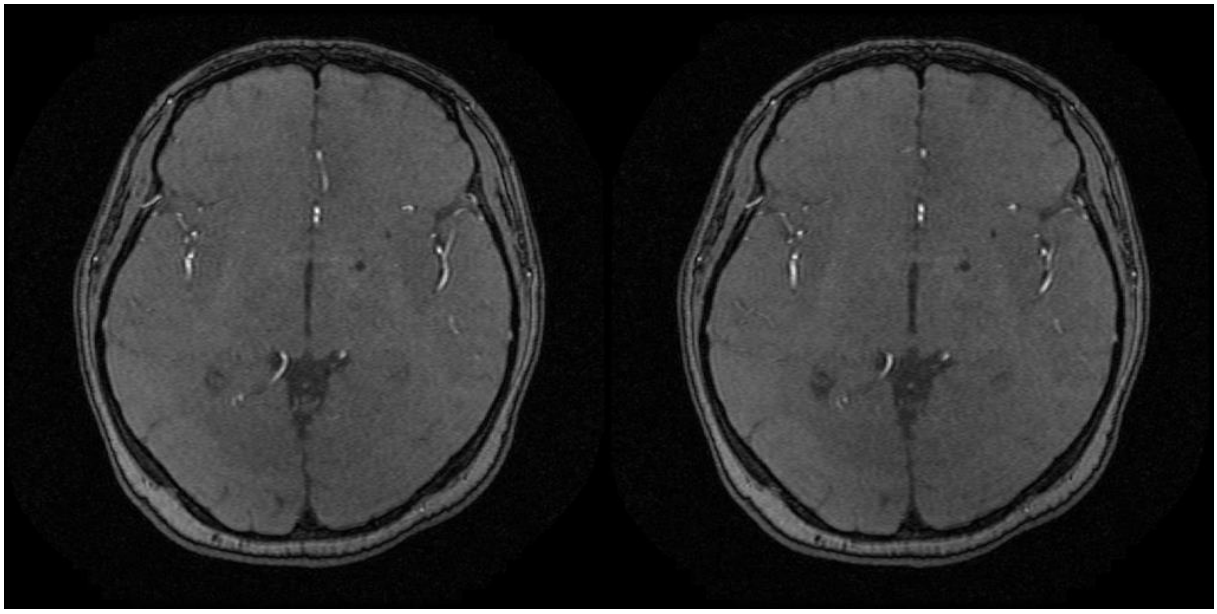

Figure 2 Patient's Magnetic Resonance Image

Patient: Female, 26 years old. Check MRI after admission: 1. The left temporal lobe gyrus and basal ganglia tumorous lesions (germ cell tumor?) First consider. 2. Local stenosis of the left middle cerebral artery. 3. Bilateral maxillary sinus, ethmoid sinus and sphenoid sinusitis. ECG: 1. Sinus rhythm 2. Normal ECG. Gynecological ultrasound: Cystic foci in the bilateral attachment area. Characteristics of EEG topographic map: the power values of each frequency band are bilaterally symmetrical, and there is no obvious abnormal distribution. Main frequency: 9-10.8Hz. Conclusion: The power in the top pillow area of the α2 frequency band is dominant. Electroencephalogram analysis: main wave rate: each lead is dominated by medium and high amplitude 10Hz alpha rhythm, and the parietal occipital region is dominant. There are 9.5 and 10.5 Hz alpha waves in between. The waveform is regular and the adjustment is acceptable. Slow wave: There is low and medium amplitude 6-7Hzθ activity between the front leads. Fast wave: There is low amplitude 18-

21Hz β activity between the front leads. Amplitude characteristics: medium and high amplitude, basically symmetrical from left to right, and amplitude modulation is acceptable. Open your eyes: (-) Hyperventilation: Same background. Impression: Normal range EEG. BAEP: Both sides are generally normal. Cardiac ultrasound: a little regurgitation of the mitral valve. After consultation, our department recommends to transfer to the department for further treatment, improve the relevant examination after transfer, and temporarily give symptomatic treatment.

Current situation: The general condition of the patient is OK. The physical examination shows: clear consciousness, correct answers, bilateral pupils, etc., isometric, 3mm in diameter, sensitive to light reflection, and normal muscle strength and muscle tone.

Current diagnosis: 1. Cause of abnormal intracranial signal: tumor? infection?; 2. Middle cerebral artery stenosis.

Combined with the scope of tumor lesions, it can be divided into mass tumors and diffuse infiltrating tumors. The lesions of diffuse infiltrating tumors mainly show large patchy high signal or slightly higher signal, and the occupying effect is not significant. Small, round necrosis can be seen inside In the area or cystic change area, the enhanced scan of this type of patient found that there was a slight enhancement of scattered spots and patches. Mass tumors have a significant space-occupying effect. Solid wall nodules can be seen in cystic lesions, and the nodules present a uniform high or slightly high signal. The enhanced scan of this type of patients found that there was a uniform and significant enhancement phenomenon, cystic changes. There is no reinforcement within. The experimental data of this study showed that the sensitivity of MRI diagnosis of central nervous system ganglion cell glioma was 80.00%, the specificity was 83.33%, and the accuracy was 81.25%. Statistical analysis shows that the accuracy of MRI diagnosis and pathological examination is not There are differences, which indicates that MRI diagnosis of central nervous system ganglion cell gliomas has significant clinical value, high accuracy, and low misdiagnosis rate and missed diagnosis rate, which can provide an important basis for clinicians to analyze and diagnose the disease.

5. Conclusion

MRI diagnosis of patients with ganglion cell gliomas in the central nervous system can improve the accuracy, sensitivity and specificity of the diagnosis, and can provide a reference for clinicians to treat patients. It is worthy of clinical recommendation. In the follow-up discussion of this group, large samples and long-term discussions can be taken, and in-depth analysis of diagnostic methods can be carried out, which promotes the increased clinical guidance of this group of studies.

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