

Oligodendroglioma in 40 years old male – A case report

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ABSTRACT

Oligodendrogliomas are quite rare among the brain tumors as a group. Oligodendrogliomas may occur at any age, but the initial diagnosis has two incidence peaks: 6–12 years and 35–44 years. The most common presenting symptom of oligodendroglioma is seizures, ranging in incidence from 35-85% of patients. MRI and CT scan of oligodendrogliomas may be characteristic but are not pathognomonic. Early stereotactic biopsy is needed to establish the final diagnosis and is recommended by many authors. As the prognosis appears to be good if the tumor is resected early, and histopathological examination is must to establish final diagnosis.

Key words: Oligodendroglioma, Brain tumor, Histopathology.

1. INTRODUCTION

Oligodendrogliomas are the tumors of normal glial cells of brain called oligodendrocytes. They represent approximately 4% of all primary brain tumors and less than 1% of primary childhood brain tumors (Chitkara et al., 2002). Oligodendrogliomas are supratentorial tumors in more than 90% of cases (Lee et al., 2010). CT scan and MRI are very helpful for the preoperative management of oligodendrogliomas. Early stereotactic biopsy is needed to establish the diagnosis and is recommended by many authors (Chamberlain, 1994). Histologically distinguishing between pure oligodendrogliomas from other gliomas is very important in determining if chemotherapy may be an effective treatment (Behin et al., 2003). Here in we are presenting a case of male patient with diagnosis of oligodendroglioma where we are able to find and document the typical features of oligodendroglioma.

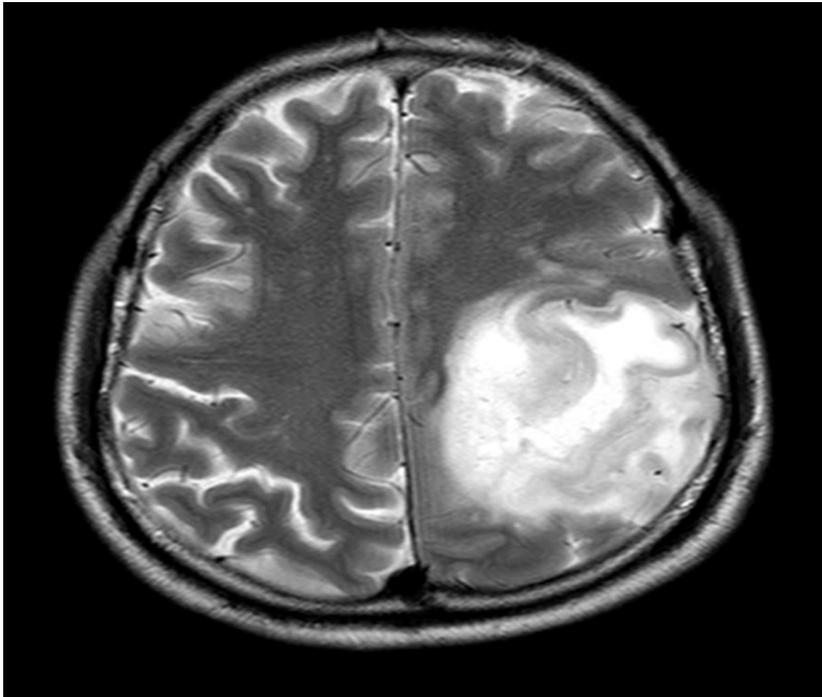


Figure 1
Low grade glioma in left temporo-parietal lobe on T2WI. (MRI)



Figure 2
Gross specimen examination showed gelatinous consistency of the tumor owing to the accumulation of myxoid matrix materials

2. CASE REPORT

A 40 years old male patient presented with complains of seizures and headache since 2 months. Patient was having past history of fall in well 3 years back which was not associated with seizures at that time. On CNS examination, right side weakness present, (power 3/5). MRI showed ill defined hypo intense on T1W1 and DWI was seen involving left posterior temporal lobe extending to high convexity. Peritumoral white matter edema causing mass effect on trigone and occipital horn on left ventricle. Overall findings were in favor of low grade glioma (Figure 1). Patient was underwent neurosurgery and the gross specimen was sent to the histopathology department. Gross examination of the specimen showed tumor measuring 4 X 3.8 cm with gelatinous consistency owing to the accumulation of myxoid matrix materials (Figure 2).

Microscopic examination showed monomorphic tumor cells with uniform round vesicular nuclei, distinct small nucleoli, and perinuclear halo. There was presence of arborizing thin capillaries known as chicken wire pattern (Figures 3 & 4) Overall findings were in favor of low grade oligodendroglioma. On Immunohistochemistry, the findings suggested of cytoplasmic GFAP positivity by minigemistocytes and gliofibrillary oligodendrocytes (Figure 5). Overall findings suggested of oligodendroglioma. The patient had an uneventful postoperative course, and he came for follow up after 26 days with no complaint.

3. DISCUSSION

Oligodendrogliomas are quite rare among the brain tumors as a group (Earnest et al., 1950). The incidence peaks of oligodendrogliomas are 6–12 years and 35–44 years but it can occur at any age (Wrensch et al., 2000). Like astrocytomas, their distribution is usually proportional to the normal distribution of their cell type within the central nervous system (CNS) (Engelhard et al., 2002; 2003). More than 90% arise in the supratentorial white matter, most commonly in the frontal and temporal lobes (Engelhard et al., 2003). Less than 10% occur in the posterior fossa and spinal cord (Lee et al., 2010; Engelhard et al., 2003; Olson et al., 2000).

Oligodendroglial tumors have a tendency to invade the leptomeninges (Engelhard et al., 2002; Reifenberger et al., 2000). Delayed cerebrospinal fluid metastases (either leptomeningeal seeding or “drop metastases”) occur in 1 to 2% of cases. Majority of patients (35-85%) are presenting with complaint of seizure (Engelhard et al., 2003). In the last years, new techniques of neuro images and histopathological methods have been added to the diagnosis of cerebral mass lesions. Imaging findings (CT scan and MRI) of oligodendrogliomas may be characteristic but are not pathognomonic (Engelhard et al., 2003). Early stereotactic biopsy is needed to establish the diagnosis and is recommended by many authors (Chamberlain, 1994).

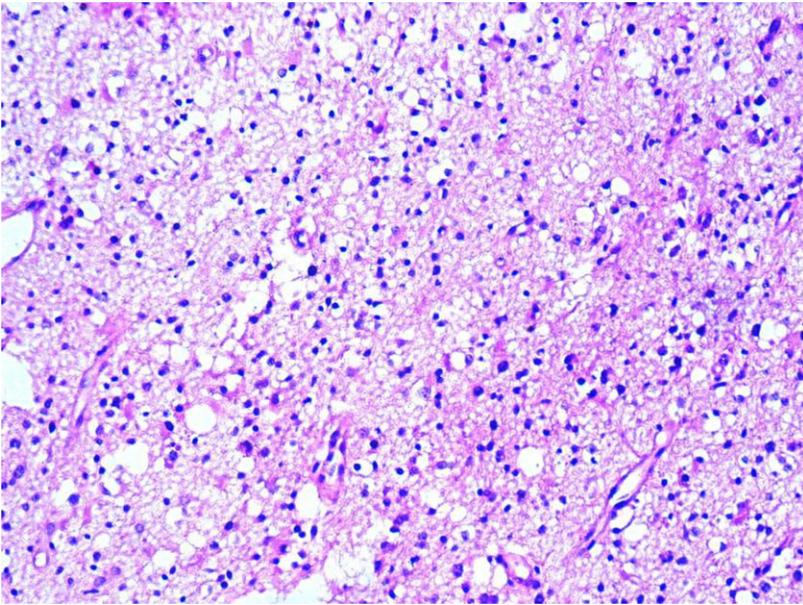


Figure 3
Oligodendrocytes having vesicular nuclei and clear cytoplasm and chicken wire blood vessels. (H & E, 10 X)

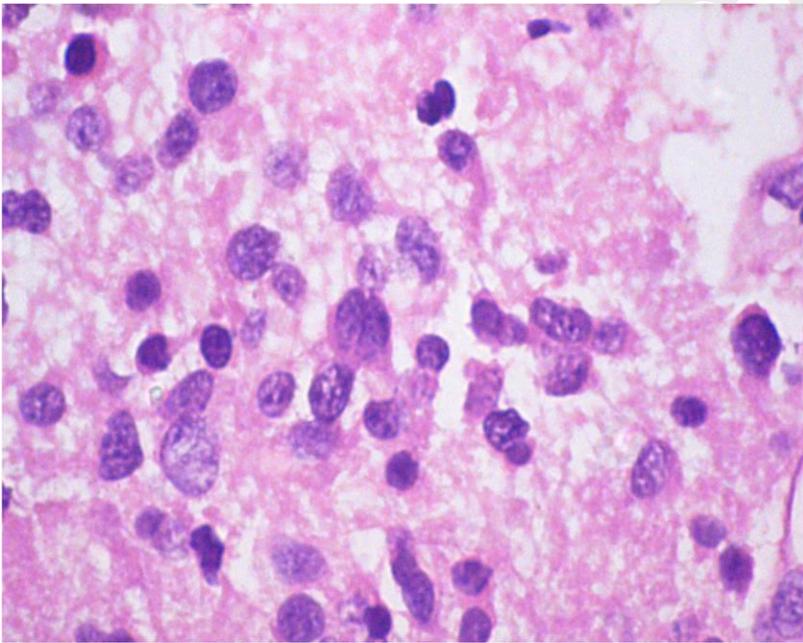


Figure 4
Oligodendrocytes with vesicular nuclei and eosinophilic cytoplasm. (H & E, 40 X)

Microscopically, the well-differentiated oligodendrogliomas are characterized by rounded cells with well-defined cytoplasmic membranes, small spherical nuclei, slightly larger than those of normal oligodendrocytes, with an increased chromatin density, usually surrounded by clear haloes, without nucleoplasm. Mitotic figures may be seen. Cytoplasm which is swollen and water-clear because of its expansion, the formation of many vacuoles and the lack of cell processes. Moreover, these are moderate cellular tumors composed of sheets of cells with a delicate capillary network, usually called chicken-wire pattern, similar to the vascular pattern found in liposarcoma. Another histologic characteristic of this tumor is the aggregation of some cells surrounding blood vessels and neurons. This phenomenon, called satellitosis, is found throughout the brain, especially in the temporal lobe, also a common site of this tumor. It is important to mention that many tumors described as oligodendrogliomas contain varying percentages of astrocytic cells. It is assumed that they represent reactive astrocytes trapped by the invasive tumor, transitional forms of oligodendroglial cells or differentiated neoplastic astrocytic cells. Oligodendroglial tumors may contain cells with the appearance of small gemistocytes called transitional cells. In comparison with oligodendrocytes, the cells have a relatively larger and eccentric cytoplasm, which is positive for glial fibrillary acid protein. The most common histologic oligodendroglial feature is the mini-gemistocyte, which is a tumor cell characterized by a single round regular nucleus with an eccentric droplet of eosinophilic cytoplasm. This cell is very important for the differential diagnosis from the astrocytic gemistocyte, which tends to exhibit nuclear pleomorphism and multi nucleation. Another name we can find for this unique cell in bibliography is "honey comb" or the "fried-egg appearance," which can be seen in formalin-fixed, paraffin-embedded material. Apparently this appearance is an artefact, but we can use it often for differential diagnosis. A useful criterion for diagnosis could also be, the micro calcifications usually found as spots and near to blood vessels (Engelhard et al., 2002; Felsberg and Reifenberger, 2002; Sandra et al., 1999). The most frequent oligodendroglial cell is the mini-gemistocyte. Other special subtypes of oligodendroglial cells are the

following: the glio-fibrillary oligodendrocytes that are typical and glial fibrillary acidic protein positive, and less usual we could find signet-ring cells or eosinophilic granular cells (Felsberg and Reifenberger, 2002).

Oligodendrogliomas are divided by WHO (2000) classification into 2 malignancy grades: WHO grade II (low grade) for well differentiated oligodendrogliomas and WHO grade III (high grade) for anaplastic oligodendrogliomas which are malignant (Felsberg and Reifenberger, 2002). WHO grade II oligodendroglioma is a tumor with mild moderate hypercellularity and atypia. In addition, mitoses, micro vascular spread and necrosis are seldom or inexistent. On the other hand, WHO grade III anaplastic oligodendroglioma is characterized by moderate hypercellularity and nuclear atypia. Furthermore, it is considered as a malignant tumor because mitoses are more frequent, and micro vascular proliferation or necrosis is often present (Sandra et al., 1999).

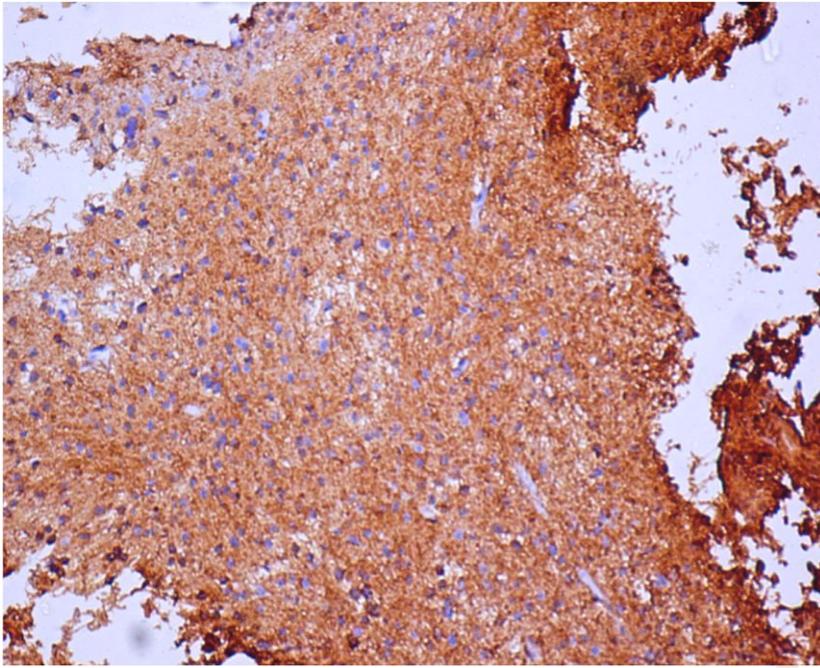


Figure 5
Diffuse expression of GFAP by minigemistocytes. (IHC, 10 X)

4. CONCLUSION

WHO is the current grading system for oligodendroglioma and it is based on morphologic criteria only. Current treatment modalities for low-grade gliomas include surgery, radiotherapy and chemotherapy. The prognosis appears to be good if the tumor is resected early so that histopathological examination which is the gold standard tool for the final diagnosis is must.

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