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A Conflicting Case of Childhood Oligodendroglioma

Tartışmalı Bir Çocukluk Çağı Oligodendrogliom Olgusu

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Anahtar Kelimeler: Oligodendrogliom, menenjiom, manyetik rezonans görüntüleme

Introduction

Oligodendrogliomas account for 5-20% of all glial tumors. They have a predilection for the frontal lobe and are commonly seen in adults (1). Oligodendrogliomas are rare in children and account for less than 1%-2% of primary pediatric brain tumors (2).

Herein, we report a childhood oligodendroglioma that was misdiagnosed as meningioma and discuss diagnostic pitfalls of childhood oligodendrogliomas.

A 4-year-old boy who had intractable generalized tonic-clonic seizures for two years was admitted to our hospital. A magnetic resonance imaging (MRI) scan of the brain showed an isointense lesion in the right frontotemporal region just over the anterior clinoid process reaching the right basal ganglia superiorly. T1-weighted images (T1WI) showed a lesion with heterogeneous contrast enhancement (Figure 1). The lesion was hypointense in susceptibility weighted MRI (SWI) sequences and isointense in T1WI and T2WI (Figure 2). Computerized tomography (CT) revealed a hyperdense lesion located under the frontal lobe, which was interpreted in favor of coarse calcification (Figure 3). Digital subtraction angiography revealed angiogenesis under the right frontal lobe. We performed multivoxel magnetic resonance spectroscopy (MRS) with 135 ms and 30 ms echo time values and the findings were in accordance with a low grade glial tumor.

The patient underwent a right frontotemporal craniotomy under general anesthesia. Postoperative period was uneventful and the patient's neurological examination was unremarkable. Histopathologic examination of the specimen was consistent with oligodendroglioma grade II.

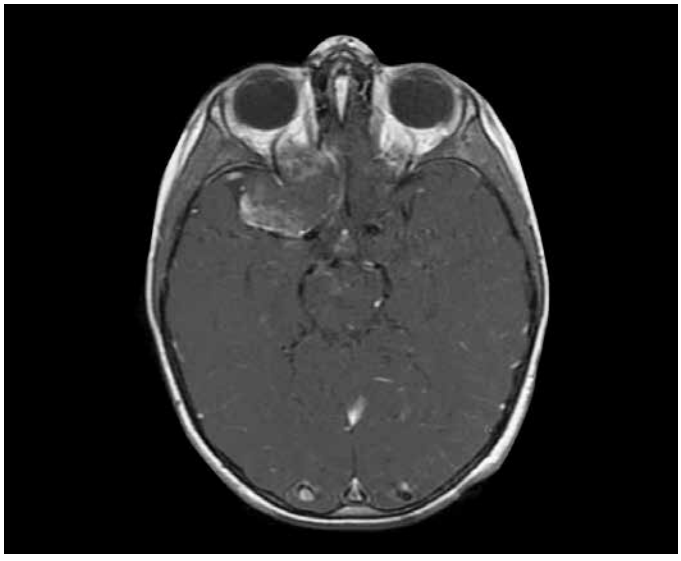

Figure 1. T1-weighted axial images showed a lesion with heterogeneous contrast enhancement

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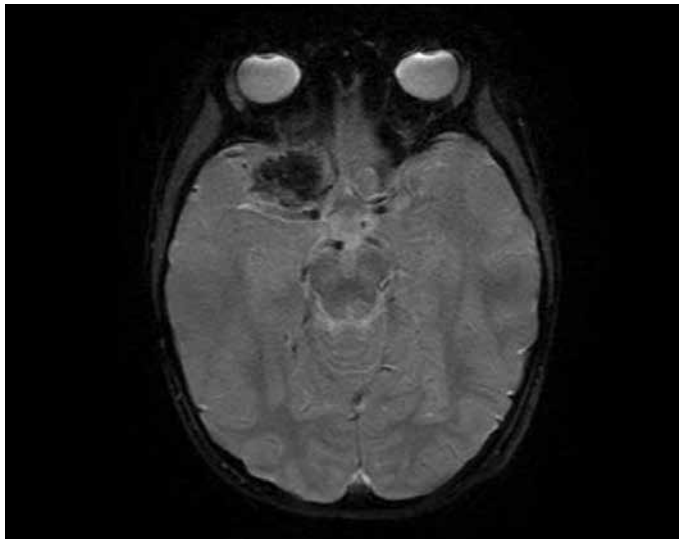

Figure 2. The lesion was hypointense in susceptibility-weighted magnetic resonance imaging sequences

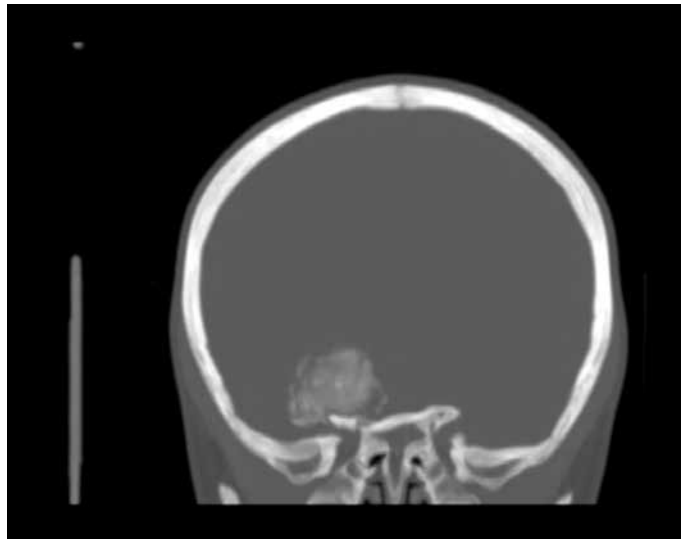

Figure 3. Coronal brain computerized tomography revealed a hyperdense lesion located under the frontal lobe, which was interpreted in favor of coarse calcification

Childhood oligodendrogliomas and meningiomas can share similar radiologic properties such as calcification, large tumor volume, isointensity, minimal post contrast enhancement due to coarse calcification and absence of dural tail sign on MRI studies (1,3). Oligodendrogliomas show frequent post-contrast enhancement on MRI and gadolinium enhancement, which is suggested to be proportional to tumor vascularity. However, tumors with dense calcifications, like our case, can show minimal post contrast enhancement (3). Among intra-axial brain tumors, oligodendrogliomas have the highest frequency of calcification (approximately 80%). Childhood meningiomas also appear as cystic and calcified intracranial masses (4). The use of SWI in the detection of calcification as hypointense areas has been reported in the literature; however, CT is superior in detecting calcifications (4). In this case, the lesion was hypointense in SWI sequences and isointense in T1WIs and T2WIs, which are pathognomonic for calcification. The patient's CT also showed close proximity to the anterior clinoid process, which could have been consistent with a medial sphenoid wing meningioma (1). MRS is a useful radiologic study in differentiating glial tumors from other pathologies. Choline and lactate are important markers of glial tumors and there is a direct correlation between lactate levels, which present as a double peak in the MRS and glioma grade (5).

In conclusion, it can be difficult to differentiate oligodendrogliomas from meningiomas in children due to intraparenchymal location and possible coarse calcification. Oligodendrogliomas can show malignant transformation and must not be misdiagnosed as meningiomas (3). Preoperative differential diagnosis of these two pathologies is of great importance in management.

Ethics

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Doğa Gürkanlar, Ferhat Harman, Concept: Doğa Gürkanlar, Design: Doğa Gürkanlar, Ferhat Harman, Senem Mut, Data Collection or Processing: Doğa Gürkanlar, Analysis or Interpretation: Senem Mut, Literature Search: Doğa Gürkanlar, Senem Mut, Writing: Doğa Gürkanlar, Ferhat Harman, Senem Mut.

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