Case Report

Glioblastoma multiforme misdiagnosed as squint: A case report

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Abstract

Glioblastoma multiforme (GBM) is a high-grade tumor of the brain that arises from the supporting cells of neurons (astrocytes and oligodendrocytes) within the brain. GBM is a rare occurrence in children but fatal; hence, timely diagnosis is crucial to the prognosis of the patients. While GBM can present with several signs and symptoms, headaches and vomiting and headaches relieved by vomiting are common presenting complaints. Strabismus is an uncommon sign of GBM. Here, we discuss an 18-year-old girl diagnosed with GBM who presented with strabismus and was initially misdiagnosed as a squint and revise some of the literature already present on Glioblastoma multiforme.

Keywords: Brain tumour, glioblastoma multiforme, headache, squint, strabismus, visual loss

Introduction

In malignant brain tumors, Glioblastoma is the most common among both adults and children but the incidence rate in children is lower. GBM is a high-grade (WHO grade IV) tumor that can arise anywhere in the brain and metastasize very quickly. Majority of the brain tumors in children affect the supratentorial part of the brain (cerebrum). GBM only comprises 3%–15% of primary brain tumors in children.[1] Literature shows that GBM in pediatric population has poor prognosis, with high morbidity and mortality. A 2012 Central Brain Tumor Registry of United states report showed that the incidence rate of pediatric high-grade glioma was approximately 0.85/100,000.[2] The case that we are presenting is of an 18-year-old girl who was diagnosed with glioblastoma of the frontal lobe with temporal lobe metastasis.

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Clinical presentation

An 18-year-old girl presented to the outpatient department with painless loss of vision bilaterally which progressed for the last 3 months. It was associated with headaches. A corrective surgery was performed 4 years ago in right eye for the complaint of squint. Preoperative visual acuity was 6/12 bilaterally. After the corrective surgery, her right eye visual acuity worsened to counting fingers and visual acuity of left eye remained 6/12. On presentation to the ophthalmology clinic now, her physical examination revealed bilateral exotropia and right eye drooping [Figure 1].

All of her investigation performed during her current visit were normal except for her imaging studies. Multiplanar T1/T2 imaging of the brain showed a heterogeneously enhancing mass measuring about 5 × 4.8 × 5.5 cm in the right frontal lobe. The mass was crossing into the left frontal lobe. Another heterogeneously enhancing mass of the same intensity was seen in the right temporal lobe with a compression effect on the cerebral peduncle. There was compression of the frontal horn of

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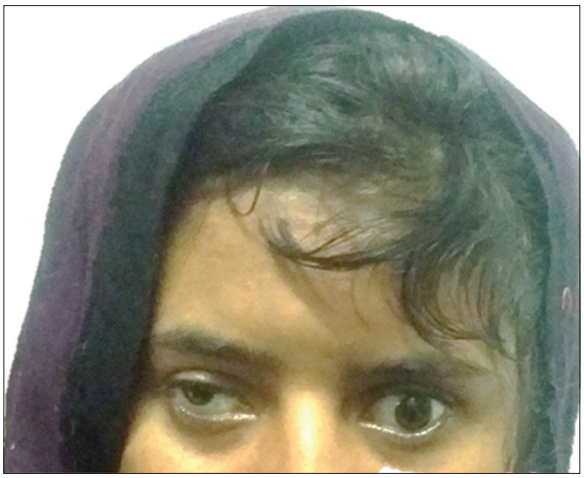

Figure 1: Squint and drooping of right eyelid

the lateral ventricle. She was referred to a specialist neurosurgeon for further management. She was advised to undergo tumor resection and chemotherapy [Figures 2 and 3].

Discussion

In children, the second most common tumors overall are brain tumors. Glioblastoma Multiforme (GBM) is WHO grade IV solid cell tumor of the brain that arises from glial cells. Report by Central Brain Tumor Registry of the United States (CBTRUS) published in 2020 states that glioblastoma multiforme is the no. 1 malignant brain tumor in the US comprising 14.6% of all brain and CNS tumors.[3] According to the CBTRUS report, 6.06/100,000 children and adolescents were diagnosed with brain or other CNS tumors in 2019.[3]

The cerebral hemisphere is the most common location of glioblastoma multiforme in majority of the cases.[4] Among children, supratentorial localization of the tumor is more common in 11–21 years old children, while infratentorial tumors are more common in children 0–10 years old.[5] If GBM arises from a low-grade astrocytoma, the clinical history of the patient can span for months to years, similar to the clinical picture seen in our patient. Headaches are a common symptom in GBM seen in 30% to 50% of cases.[6] The tumor can also directly affect the tissues in immediate vicinity usually causing focal neurological deficits seen in 40% to 60% of cases;[6] this is the most likely explanation for the squint and progressive visual loss observed in the case presented here. The fact this patient initially presented with squint before any history of headache or visual loss is new with no example of a similar case in current literature.

The mainstay when it comes to treatment of GBM is surgical excision followed by radiotherapy and chemotherapy with temozolomide; this approach is called Stupp's protocol. It is important to note that despite above mentioned treatment combination, it is difficult to achieve a prolonged remission of the tumor. Fortunately, a lot of research and clinical trials are

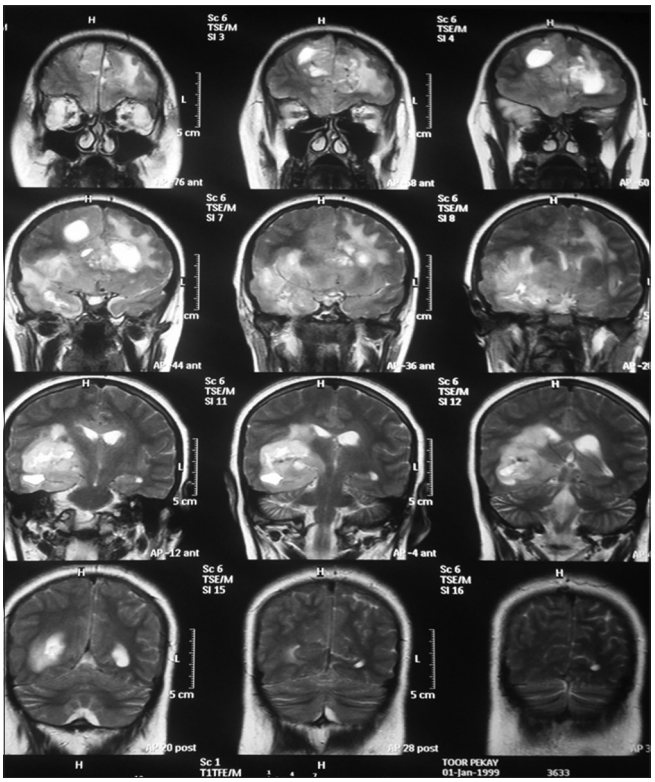

Figure 2: Contrast-enhanced MRI of brain and orbit showing enhanced tumor mass in cut sections

being performed to discover new and more effective strategies to treat glioblastoma. Some of the newer approaches include use of drugs that disrupt the most common signaling pathways that are dysregulated in the tumor,[7] use of nanotechnologies such as lipopolymer nanoparticles, dendrimer nanoparticles, and hybrid nanoparticles for more efficient delivery of antitumor drugs across blood–brain barrier,[8] and use of radioisotopes in combination with antitumor drugs to attack the tumor cells,[9] which are some of the newer techniques that have shown potential during phase I and phase II trials in being effective against the tumor and have shown to reduce tumor size and improve survival rates.

Conclusion

Glioblastoma Multiforme among malignant tumors is the commonest malignant tumor affecting the brain. Although it is less common in children as compared to adults, the high mortality rate and difficulty in achieving a sustained remission make it dangerous still. As seen in our patient, origin of the tumor from low-grade glial cells can result in a more gradual progression of the disease symptoms. It is treated with combination of debulking surgery, radiotherapy, and chemotherapy but in most cases the prognosis is still poor.

Implications for general practice

Our patient first presented with strabismus at the age of 13 years, before the current diagnosis of GBM could be made. She also

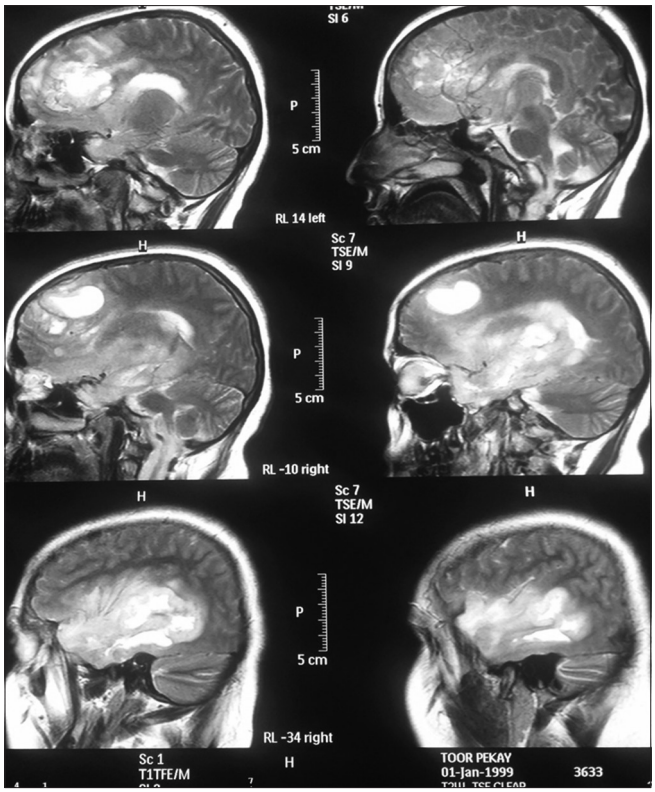

Figure 3: Contrast-enhanced MRI of brain and orbit (lateral view)

underwent corrective squint surgery with no imaging studies of the brain done at that time. Primary care physicians are at times dealing with patients of squint; therefore, proper exploration or timely referral to specialized center of relevant cases must be done by primary care physicians. This practice can lead to early diagnosis and treatment of the tumor.

Declaration of patient consent

The authors certify that informed consents from the patient and her guardians were obtained regarding the publication of her images and clinical information. The patient understands that her photograph and reports may be published and efforts will be taken to conceal her identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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