

# Brain tumour in adolescents and young adults: Challenges in making the diagnosis for frontliners

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Dear editors,

Brain tumours in adolescents and young adults (AYA) often pose diagnostic challenges due to their various features of presentation. Since headache is the most common complaint for this condition, there is some overlap between primary headache syndromes. The standard age ranges from 15 to 39 years in AYA patients, making primary headache syndrome the most prevalent diagnosis. Thus, a prolonged period of misdiagnosis is not uncommon. Local data show that brain tumours are common in those more than 40 years old and peak between 51 and 60 years of age.<sup>1</sup> However, our data show that those who have had a headache for more than one month would have multiple outpatient visits before being diagnosed.

We share two cases illustrating challenges in diagnosing brain tumour in AYA patients. The first case involves a 24-year-old lady, an engineering student who had daily headaches for one year. The location of the headache was at the occipital region, and the headache was throbbing in nature and progressively worsening over the past year. She had visited multiple outpatient visits for the past year and was treated with paracetamol. She also complained of bilateral blurring of vision and photophobia for the past four months, which was not corrected by wearing spectacles. The symptoms were associated with occasional vomiting, loss of appetite, and unintentional weight loss of approximately 7 kg in four months. Clinically, she was alert and orientated to time, place, and person. Her vital signs were stable. Upon examination of the cranial nerves, she was found to have anosmia and impaired visual acuity (right side 6/12 and left side 6/15). Her pupils were 3-mm in diameter, bilateral, and reactive. Otherwise, her motor, sensory, and cerebellar examinations were normal. Her plain computed tomography (CT) of the brain showed the presence of an intraparenchymal lesion at the frontal lobe compressing the ventricles. Magnetic resonance imaging (MRI) T2W showed a heterogeneously hyperintense mass with avid enhancement noted in the postcontrast study. She was admitted to the neurosurgical ward and underwent surgery.

The second case involves a 21-year-old lady who presented to an outpatient with blurred vision in the left eye for one week. She was concerned about her visual impairment as she failed her driving tests. Upon fundoscopy examination at the clinic, she was found to have bilateral papilledema and was referred to the ophthalmology clinic for a detailed eye assessment.

Further history revealed that she had an intermittent right-sided headache associated with nausea and vomiting for four years. For the past year, she started to feel occasional right-sided facial numbness and anosmia. She had had multiple outpatient visits previously for her headache and was treated symptomatically. She also had a history of low mood and forgetfulness. Her visual acuity was 6/6 over the right eye and 6/24 over the left eye. She was diagnosed with bilateral papilledema. Her pupils were 3-mm in diameter, reactive, and bilateral. Upon examination by the neurosurgical team, the patient had impaired olfaction and vision, with altered sensation over the left-sided trigeminal nerve distribution. The corneal reflex was impaired over the left eye. The findings of motor, sensory, and cerebellar system examination were normal. Her CT of the brain showed a large lobulated extra-axial mass centred in the anterior cranial fossa with a connection to the falx. Brain MRI showed an extra-axial anterior midline mass, likely intraventricular in origin. She underwent bifrontal craniotomy and tumour excision.

Both cases illustrated the absence of limb weakness during the presentation. Instead, these cases had neuro-ophthalmic complaints such as headaches and blurring of vision in addition to anosmia. Complete cranial nerve examinations are paramount to avoid missing the diagnosis. Fundoscopy is necessary, and the ability to detect early stage of papilledema is essential. The MOBI-Kids study showed that neurological deficits occur in only 40% of cases<sup>2</sup> and may be a late feature. Therefore, a lack of motor and sensory deficits does not rule out a brain tumour. The locations of the brain tumours determine the clinical features. The most common tumour site in AYA patients is the frontal lobe (28.8%), followed by the temporal lobe (13%), cerebellum (8.7%), parietal lobe (7%), brainstem (6%), occipital lobe (1.4%), and the remaining parts of the brain (35.1%).<sup>3</sup> Symptoms such as visual abnormalities, behavioural changes, and cognitive and memory impairment should be taken seriously during history taking.<sup>2</sup>

Although a mnemonic of SNOOP for red flag features was emphasised for better detection of sinister secondary headache, the focus is mainly for those more than 40 years. SNOOP stands for systemic symptoms or signs, neurologic symptoms or signs, sudden onset or onset after the age of 40 years, and changing headache patterns.<sup>3</sup> Therefore, there are limitations in applying these red flag features for screening AYA patients.

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A high index of suspicion is critical at the primary care level and emergency department to diagnose brain tumours in AYA patients. Many patients went on to have multiple outpatient visits before receiving appropriate diagnostic imaging. The non-specific early symptoms of brain tumours, such as anosmia and neuro-ophthalmic complaints, should be followed by a thorough neurological examination. Early detection and management are crucial, as most brain tumours in AYA patients have good prognoses.

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