Complete Recovery Following Surgical Resection Inchildhood Pilocytic Astrocytoma

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Abstract

Pilocytic Astrocytoma (PA) is a common type of brain tumour disease in the paediatric population. The cerebellum is the most common site of tumour origin. Here we present a 5-year-old girl who referred with gait imbalance,truncal ataxia and tandem gait which was later radiology and pathologically identified as Pilocytic Astrocytoma. Complete surgical resection was performed and it resulted in complete recovery.Knowledge of these imaging manifestations of pilocytic astrocytoma may be helpful to early recognition and prompt treatment.

***Keywords**:, children, disease,pilocytic astrocytoma, surgical resection*

Introduction

Pilocytic astrocytoma (PA) is a common type of brain tumour disease in the paediatric population. PA isarare, slow-growing glioma, classified as grade I by the World Health Organisation (WHO). It accounts for approximately 25% of all central nervous system tumours and 42% - 66% of all paediatric brain tumours in the age group 0-14 years, and has been reported to be the most common gliomas and cerebellar tumours in children[1].

Children with astrocytoma classically present with signs and symptoms of obstruction of CSF flow and cerebellar dysfunction. Common presenting symptoms include headache, nausea and vomiting, gait imbalance and visual disturbances. As the tumour increases in size, there is usually progressive truncal ataxia and papilledema due to increased intracranial pressure. Symptoms are usually present for less than three months before diagnosis, although early in the course of illness, the symptoms may be subtle and intermittent[2].

The diagnosis of astrocytoma is supported by either Computer Tomography (CT)scan or Magnetic Resonance Imaging (MRI). Histopathology examination is the gold standard to establish

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diagnosis of astrocytoma.It is characterised by Rosenthal fibres and eosinophilic granular bodies[3].

Prognosis for astrocytoma is primarily based upon the tumour location and presence or absence of neurological deficits at the time of presentation[4].

The Case

A 5-year-old girl who presented with gait imbalance, truncal ataxia and tandem gait for onemonth. She reported no history of seizure, trauma, fever, nausea, headache, decrease of consciousness, blurred vision, nor nuchal rigidity. On examination, the patient had increase of deep tendon reflexes, Babinskiand Chaddock signs were positive in both plantar andmotoric examination showed decrease of muscle strength in lowerextremities. Head MRI confirmed cystic intraaxial lesion with heterogenous contrast enhancing large mural nodule of the left cerebellum, appropriate with pilocytic astrocytoma compressing the fourthventricle causing non-communicating hydrocephalus and periventricular and perioptic nerve edema (Figure1).

The patient was considered for External Ventricular Drainage (EVD), surgical resection and the pathological interpretation of the mass. The patient tolerated the procedure well without complications. Pathological findings confirmed astrocytic cells with a focus on the formation of Rosenthal fibre consistent with pilocytic astrocytoma.

Head CT scan evaluation after surgical resection revealedsolid cystic lesion and residual mass at left fossa posterior, ventricular dilatation with attached EVD, and subdural hygroma in fronto-temporo-parietal on either side (Figure2).

The patient was discharged without any complaint nor neurological sequelae and in stable vital sign. Patient was planned to routinely control to the Neuropediatric Outpatient Clinic.

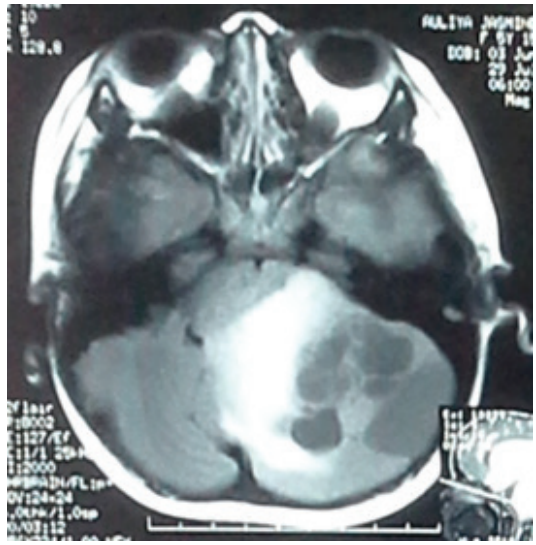

Figure 1. Head MRI showing pilocytic astrocytoma compressing the fourthventricle andcausing non-communicating hydrocephalus.

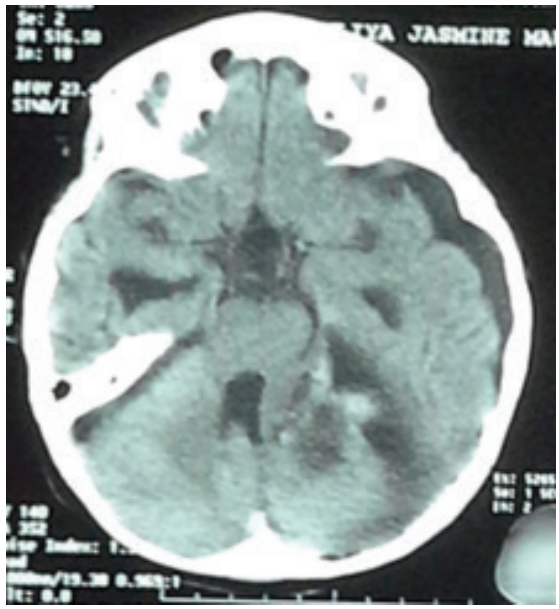

Figure 2. Head CT scan evaluation revealedresidual mass at left fossa posterior, ventriculardilatation with attached EVD, and subdural hygroma in fronto-temporo-parietal on either side.

Discussion

Pilocytic astrocytoma (PA) are WHO grade I brain tumours that occur predominantly in childhood and display benign behaviour. PA could arise in various locations in the neuroaxis, such as the optic nerve, optic chiasm, hypothalamus, cerebellum, brain stem, thalamus, basal ganglia and cerebral hemisphere, but the cerebellum is the most common site of origin[1].Clinical signs and symptoms of pilocytic astrocytomas manifestations depend on the location of the tumour. Patients with tumour in the posterior fossa present with signs and symptoms of increased intracranial pressure (i.e headache, nausea, vomiting, mental status changes and hypertension) and cerebellar dysfunction (i.e weakness, ataxia, poor balance, dysmetria)[5]. Broad areas of weakness are more likely to be either damage to the central nervous system or a systemic disease that is attacking nerves. True weakness can be caused by problem affecting upper motor neurons, lower motor neurons, the neuromuscular junction or the muscle itself. Children with posterior fossa tumour are associated with hydrocephalus. Treatment of the hydrocephalus associated with fourth ventricular obstruction by the tumour mass is usually performed using multiple ventricular taps, insertion of external ventricular drains, and internal CSF shunt for initial therapy of hydrocephalus[6].

The diagnosis of astrocytoma is supported by Magnetic Resonance Imaging (MRI)[7]. Histopathology examination is the gold standard to establish diagnosis ofpilocytic astrocytoma.In our case, histologically thetumourwas characterised by Rosenthal fibres and eosinophilic granular bodies[2]. Cerebellar pilocytic astrocytoma are generally resectable and adjuvant therapy is not indicated. In our case, complete surgical resection is recommended as the best treatment option for PA.Overall, the surgery leads to over 90% long-term survival[8].The 10-year survival rate is greater than 90%; complete surgical resection is generally considered curative.The overall prognosis is primarily based upon the lesion location and presence or absence of neurological deficits at the time of presentation[9].

Summary

Early recognition and treatment of PA can decrease morbidity and mortality. The treatment focuses on surgical resection. Our patient was performed External Ventricular Drainage (EVD) and resection of the tumourto reduce high intracranial pressure. After the surgery the patient was in complete recovery.

Conflict of Interest: The authors declare no competing interest

Ethical Clearance: This is a case report and inform consent was approved and taken from the parents.

Source of Funding: Self funding

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