Giant Solid Cystic Hypothalamic Hamartoma with Precocious Puberty in a 2.5 years old Girl

Muhammad Mujahid Sharif1, Sanaullah Khan2, Umar Farooq3, Sameena Khaleeq4, Mohammad Tahir5, Khaleeq uz Zaman6, Summaya Sohail7

1 Department of Neurosurgery, Pakistan Institute of Medical Sciences (PIMS), Islamabad
2 Resident, Department of Histopathology, Federal Government Polyclinic Hospital, Islamabad
3 Resident Neurosurgeon, Department of Neurosurgery, PIMS, Islamabad
4 Consultant Neurosurgeon, Department of Neurosurgery, PIMS, Islamabad
5 Consultant Histopathologist, Federal Government Polyclinic Hospital, Islamabad
6 Consultant Neurosurgeon, Department of Neurosurgery, PIMS, Islamabad.

Abstract
Hypothalamic hamartoma is a rare congenital non-neoplastic entity consisting of neurons, glial cells and fiber bundles. These hamartomas present with precocious puberty, epilepsy or both. We report a large cystic hamartoma that led to precocious puberty in a 2.5 years old girl.

Keywords: Hamartoma, Hypothalamus, Precocious puberty

Introduction
Hypothalamic hamartomas are very rare (1:200,000) developmental, histologically benign, heterotopic tumors and range in size from 17.9 to 18 mm.1,2 When their dimensions exceed 30-40 mm, they are classified as giant hypothalamic hamartomas.1,3 Most of the patients with hypothalamic hamartomas present with clinical features of precocious puberty, gelastic seizures or both.4,5,6 It may also present with developmental delay and signs of raised intracranial pressure.2 Pathogenesis of precocious puberty and its optimal treatment is not yet established. Therapeutic options include surgical excision and administration of GnRH analogues.3,5

Case Report
A 2.5 year old girl presented in O.P.D with twelve months history of progressively increasing headache and irritability more during night time and ten months history of abnormal vaginal bleeding and progressive breast enlargement. She was slow as compared to children of her age group. There was no history of vision or gait disturbances or seizures. Her breasts were enlarged and she had papilledema.

Figure 1: Enlargement of the breast with nipple discharge.

Figure 2: X-ray wrist joint showing bone age (2 to 2.5 years)
Endocrine evaluation revealed FSH 4 mlu/ml. LH 3mlu/ml. Prolactin 5ng/ml Estrogen 25pgm/ml follicular phase. Bone age was 2 to 2.5 years.

Figure 3: Sagittal views T1 WI with contrast

Figure 4: Axial view T1 WI with contrast

Figure 5: Axial views T2WI showing relationship of the solid component with the basilar artery and cystic component with the internal carotid arteries.

MRI revealed a single 3 x 2 cm solid-cystic lesion in sellar, suprasellar region. Cystic part of the lesion was compressing pituitary gland. Solid component lies anterior to pons just lateral to the basilar artery. Solid component was contrast enhancing. There was associated mild ventriculomegaly but no periventricular lucency. Tumor was approached through right sub-frontal approach. Cyst was entered and drained then solid component was removed in piece meal fashion. It was grayish white in color and firm in consistency. Microscopic Examination of the lesion showed a hypothalamic hamartoma composed of irregular distribution of ganglion cells of various sizes & shapes. (Figure-6)

Figure 6: Histological Features of Hypothalamic hamartoma on H&E.

Post-operative period & Follow up: Post-operative period was smooth except that she developed third nerve palsy (Figure 7). After three months of surgery her third nerve palsy improved, breast reduced to normal size (Figure 8) and vaginal bleeding stopped.

Figure 7: Post-operative Left Third Nerve Palsy
Discussion

Hypothalamic hamartoma is the cause of 75% of cases of precocious puberty in 1 to 3 years old children. Precocious puberty may have peripheral or central cause. Peripheral cause includes those conditions in which sex steroid stimulation is via a mechanism other than GnRH stimulated pituitary gonadotropin secretion. Central causes result in physiologically normal but early puberty as a consequence of episodic GnRH, LH, FSH secretion. Various abnormalities which can affect the hypothalamus such as arachnoid cyst, trauma, neurophacomatosis, irradiation, neoplasm and hamartomas can result in central precocious puberty. Hamartomas act as an independent secretory organ releasing GnRH. The GnRH containing neurons within the hamartoma act as independent episodic pulsatile secretory units and are outside the normal physiological regulation. Most of the hamartomas present with triad of the symptoms: precocious puberty, gelastic seizures and developmental delay. In our case precocious puberty was the presenting complaint. There was also history of developmental delay but no gelastic seizures were observed. During surgery anatomy was highly distorted and solid component which was lying just lateral to the basilar artery was removed in piecemeal fashion. Post-operatively the breast size reduced and hormonal level fell in normal range. This case report aims to expand the current data available of this lesion and emphasize the need for appropriate clinical assessment, timely Neurosurgical intervention and correct histopathological diagnosis as it can revert the disease symptoms as observed in this patient.

Conclusion

Giant hypothalamic hamartoma is a rare congenital lesion that can manifest with Central precocious puberty (CPP), gelastic epilepsy and/or a combination of both. To the best of our knowledge, this is the first case reported of Giant Hypothalamic hamartoma presenting with precocious puberty in Pakistan.

References

2. OCUS10240