

# Intraparenchymal anaplastic meningioma in a child: A rare entity

Khursheed Nayil, Rumana Makhdoomi, Rayees Malik, Altaf Ramzan

Department of Neurosurgery, Sher-I-Kashmir Institute of Medical Sciences, Srinagar, Kashmir, Jammu and Kashmir, India

## ABSTRACT

Brain tumors are not rare in children. The common brain tumors in children are medulloblastomas and craniopharyngiomas. Intraparenchymal meningiomas are very rare. We report a case of intraparenchymal meningioma in a child who was operated with a preoperative impression of a primitive neuroectodermal tumor.

**Key words:** Brain tumors, intraparenchymal meningioma, meningioma, pediatric

## Introduction

The most common solid tumors in children are brain tumors. Among brain tumors gliomas are the commonest followed by medulloblastomas and craniopharyngiomas. Meningiomas in children are rare and intraparenchymal meningiomas are all the more rare.<sup>[1]</sup> Pediatric meningiomas occur commonly in males. The common presentation is of headache and vomiting. Tumors are usually of large size and overall behavior is more aggressive than meningiomas in adults.<sup>[2]</sup>

## Case Report

A 3-year-old male reported to our Neurosurgical out-patient-department with 2-week of headache and 4-day of vomiting. There was no history of seizures or weakness of limb movements. On examination the child was conscious, ambulant. He had bilateral papilledema. There was no cranial nerve or motor deficit. Magnetic resonance imaging brain revealed heterogeneously enhancing frontal lesion with multiple cystic areas. The lesion was causing mass effect and there was peritumoral edema also [Figure 1a-c]. Our impression on imaging was a primitive neuroectodermal tumor.

## Surgical procedure

The patient underwent frontal craniotomy and total excision of the tumor. Intra-operatively ultrasonographic localization of the cyst was done and it was aspirated before the dural opening. The contents were xanthochromic. Brain became lax. Dura was opened and the tumor was separated by dissection from the surrounding brain parenchyma. The tumor was moderately vascular and firm. There was a good plane of cleavage around the tumor, hence a complete excision was achieved. At the end of surgery brain was lax, dura was closed primarily. Patient postoperatively had subgaleal collection of cerebrospinal fluid which was twice aspirated followed by tight application of a crepe bandage around the head. However there was no improvement. A postoperative computed tomography scan revealed total excision of the tumor and with a large porencephalic cyst at the site of the tumor with hydrocephalus [Figure 2]. Patient underwent a ventriculoperitoneal shunt after which the subgaleal collection subsided. Histopathological examination revealed features of anaplastic meningioma [Figure 3] Immunohistochemistry showed the tumor to be epithelial membrane antigen positive and negative for glial-fibrillary-acidic-protein, vimentin and S-100 protein [Figure 4]. Patient was subjected to radiotherapy. On a 6-month follow-up patient is doing well.

## Discussion

Intracranial meningiomas in children are rare. Pediatric meningiomas occur commonly in males. Since meningiomas express receptors for sex hormones which modulate its growth and may thus explain the gender differences in its distribution.<sup>[3]</sup> There is an association between pediatric meningiomas and neurofibromatosis-2 and Klinefelters syndrome.<sup>[4]</sup> In a series of 15 pediatric meningiomas reported by Santos *et al.*,<sup>[5]</sup> histopathology showed WHO-I in 11 patients; WHO-II in four patients. None of the patients had WHO-III meningioma. In review of literature by Liu Y *et al.*<sup>[6]</sup>

### Access this article online

#### Quick Response Code:



#### Website:

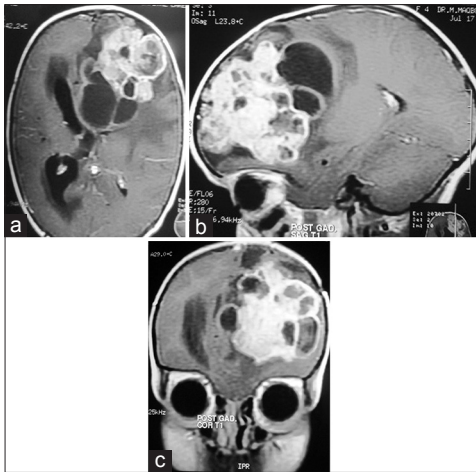
www.asianjns.org

#### DOI:

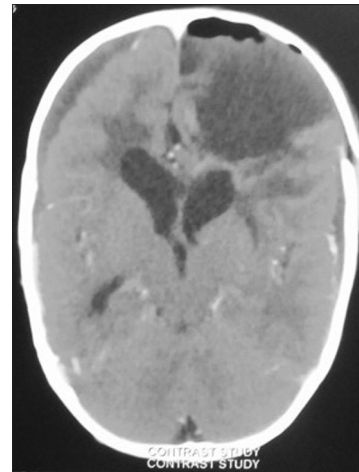
10.4103/1793-5482.154980

### Address for correspondence:

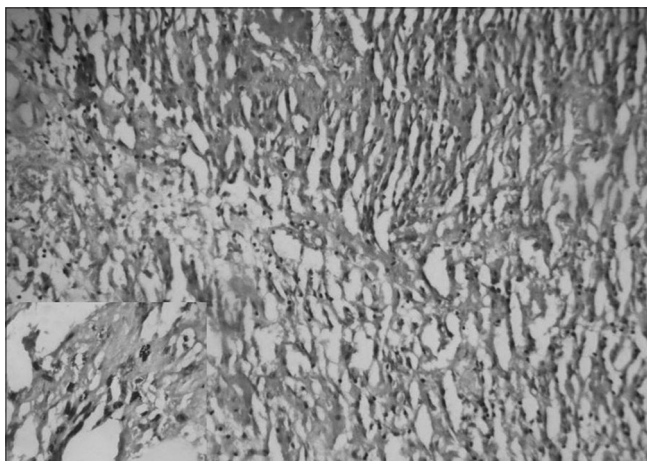
Dr. Khursheed Nayil, Department of Neurosurgery, Sher-I-Kashmir Institute of Medical Sciences, Srinagar, Kashmir - 190 011, Jammu and Kashmir, India.  
E-mail: nayilkhursh@gmail.com



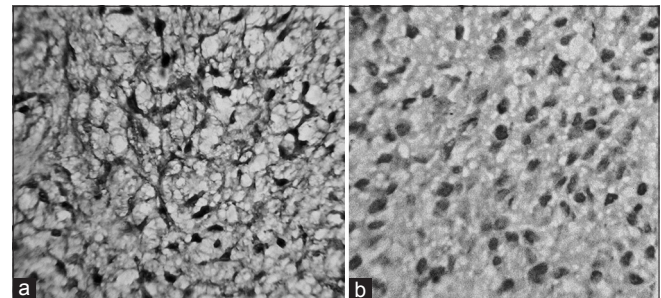
**Figure 1:** Magnetic resonance imaging brain contrast axial (a), sagittal (b) and coronal (c) shows large enhancing left frontal mass with multiple cystic areas and peritumoral edema with mass effect



**Figure 2:** Postoperative contrast computed tomography scan showing total excision of the tumor



**Figure 3:** Photomicrograph showing anaplastic meningothelial cells with areas of necrosis: H and E,  $\times 20$ ; inset shows anaplastic meningothelial cells with mitoses: H and E,  $\times 40$



**Figure 4:** Photomicrographs ( $\times 40$ ) show meningioma cells positive for epithelial membrane antigen (a) and negative for glial-fibrillary-acidic-protein (b)

in 166 meningiomas in children, it was found that the most common location was cerebral convexity (41%), followed by ventricles (15%) and cystic component was seen in 21.3% of cases and WHO-I (epithelial and fibroblastic type) contributed 55% of the cases and malignant or atypical meningiomas constituted only 9% cases. Intraparenchymal meningiomas with no attachment to dura are all the more rare in children. The existence of intraparenchymal meningiomas is explained by the presence of leptomeningeal elements in the parenchyma.<sup>[7]</sup> In a series of 1017 primary brain tumors in children, not a single case of intraparenchymal meningioma was seen.<sup>[2]</sup> We in our previous series of 248 pediatric brain tumors found only 4 cases (1.6%) of meningiomas and no meningiomas was intraparenchymal.<sup>[1]</sup>

The most common symptoms are headache, vomiting and seizures. Hemiparesis is a less common symptom.<sup>[8,9]</sup> Our patient presented with headache and vomiting.

Meningiomas occurring in children have different features than those occurring in adults viz. there is increased incidence of cystic and sarcomatous changes in the tumor, higher incidence of intraventricular location, absence of dural tail sign and aggressive behavior. Calcification, intratumoral bleed and peritumoral edema are also common. Besides these tumors are noted for large volumes.<sup>[8,10]</sup> Surgery is the best modality of treatment.<sup>[4]</sup> Radiation therapy is indicated for tumors which cannot be removed completely, high-grade tumors or for recurrent tumors.<sup>[11]</sup> In our case the lesion was moderately vascular, had a good plane of cleavage around, had no dural attachment and there were multiple cystic areas associated. The tumor could be completely excised. Though meningothelial and fibroblastic subtypes are the common variants in children however incidence of high grade meningiomas is more than in adults.<sup>[9]</sup> In our patient, the histopathology revealed it to be anaplastic meningioma (WHO-III) which was confirmed by immunohistochemistry.

Overall the prognosis of pediatric meningiomas is worse than in adults. The factors contributing to the outcome are tumor location, grade of excision, pathologic grade, association with neurofibromatosis. The 10-year recurrence rate is 33% after total excision and 82% after subtotal removal.<sup>[9,12,13]</sup> It has been

seen that even complete excision does not prevent recurrence in high-grade meningiomas, however adjuvant radiotherapy might delay recurrence.<sup>[11]</sup>

## Conclusion

We report a rare case of intraparenchymal anaplastic meningioma in a 3-year-old boy which could be completely excised.

## References

1. Nayil K, Makhdoomi R, Ramzan A, Zahoor S, Rasool M, Wani A, *et al.* Childhood tumors of the brain: Demographic pattern over a ten-year period in the Kashmir Valley. *Pediatr Neurosurg* 2011;47:31-7.
2. Bauchet L, Rigau V, Mathieu-Daudé H, Fabbro-Peray P, Palenzuela G, Figarella-Branger D, *et al.* Clinical epidemiology for childhood primary central nervous system tumors. *J Neurooncol* 2009;92:87-98.
3. Leães CG, Meurer RT, Coutinho LB, Ferreira NP, Pereira-Lima JF, da Costa Oliveira M. Immunohistochemical expression of aromatase and estrogen, androgen and progesterone receptors in normal and neoplastic human meningeal cells. *Neuropathology* 2010;30:44-9.
4. Zwerdling T, Dothage J. Meningiomas in children and adolescents. *J Pediatr Hematol Oncol* 2002;24:199-204.
5. Santos MV, Furlanetti L, Valera ET, Brassesco MS, Tone LG, de Oliveira RS. Pediatric meningiomas: A single-center experience with 15 consecutive cases and review of the literature. *Childs Nerv Syst* 2012;28:1887-96.
6. Liu Y, Li F, Zhu S, Liu M, Wu C. Clinical features and treatment of meningiomas in children: Report of 12 cases and literature review. *Pediatr Neurosurg* 2008;44:112-7.
7. Zhang J, Chi LY, Meng B, Li F, Zhu SG. Meningioma without dural attachment: Case report, classification, and review of the literature. *Surg Neurol* 2007;67:535-9.
8. Baumgartner JE, Sorenson JM. Meningioma in the pediatric population. *J Neurooncol* 1996;29:223-8.
9. Erdinçler P, Lena G, Sarioglu AC, Kудay C, Choux M. Intracranial meningiomas in children: Review of 29 cases. *Surg Neurol* 1998;49:136-40.
10. Ferrante L, Acqui M, Artico M, Mastronardi L, Rocchi G, Fortuna A. Cerebral meningiomas in children. *Childs Nerv Syst* 1989;5:83-6.
11. Im SH, Wang KC, Kim SK, Oh CW, Kim DG, Hong SK, *et al.* Childhood meningioma: Unusual location, atypical radiological findings, and favorable treatment outcome. *Childs Nerv Syst* 2001;17:656-62.
12. Wang XQ, Zeng XW, Zhang BY, Dou YF, Wu JS, Jiang CC, *et al.* Spinal meningioma in childhood: Clinical features and treatment. *Childs Nerv Syst* 2012;28:129-36.
13. Amirjamshidi A, Mehrazin M, Abbassioun K. Meningiomas of the central nervous system occurring below the age of 17: Report of 24 cases not associated with neurofibromatosis and review of literature. *Childs Nerv Syst* 2000;16:406-16.

**How to cite this article:** Nayil K, Makhdoomi R, Malik R, Ramzan A. Intraparenchymal anaplastic meningioma in a child: A rare entity. *Asian J Neurosurg* 2015;10:111-3.

**Source of Support:** Nil, **Conflict of Interest:** None declared.