http://jmscr.igmpublication.org/home/
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v7i7.51

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Histopathological Spectrum of Posterior Cranial Fossa Lesion: At Tertiary Care Center

Authors
Saini Sunita[1], Mathur Kusum[2], Saini Vikas[3*]
[1]Senior Resident, [2]Professor, [3]Resident
[1,2]Department of Pathology, SMS Medical College, Jaipur, Rajasthan
[3]Department of PSM, SMS Medical College, Jaipur Rajasthan
*Corresponding Author
Saini Vikas
Resident, Department of PSM, SMS Medical College, Jaipur Rajasthan, India

Abstract
Background: *Posterior cranial fossa is a space located between the Foramen Magnum and Tentorium Cerebelli. It includes cerebellum, pons and medulla oblongata. Tumor of posterior cranial fossa can involve any of the above structures and can produce pressure symptoms, neurological deficits or sometimes even death. This study has been conducted at S.M.S. medical collage Jaipur from January 2017 to May 2019.*
Aims and Objectives: *To find incidence and histomorphological pattern of posterior cranial fossa lesion; at our tertiary care center.*
Material and Methods: *It was a retrospective study in which 280 consecutive cases of posterior cranial fossa tumors in children and adults are studies from January 2017 to May 2019.*
Results: *Among 280 cases, 155 were male and 125 were female patient. The morphological distribution of posterior cranial fossa lesion was as follows:- 102 cases Schwannoma, 38 cases Medulloblastoma, 31 Pilocytic astrocytoma, 25 cases Epidermoid cyst, 23 cases Meningioma, 14 cases Hemangioblastoma, 11 cases metastatic carcinoma, 7 cases Glioblastoma WHO grade 4, 5 cases ependymomas, 4 cases A-V malformation and abscess, 3 cases of low grade astrocytoma and arachnoid cyst each, 2 cases choroid plexus papilloma and 1 case of each paraganglioma, TB, hemangiopericytoma WHO grade 2, ependymal cyst, AT/RT, colloid cyst, oligodendroglioma.*
Conclusions: *Posterior cranial fossa involve cerebellum, pons and medulla oblongata.These organ are vital organ so involvement of posterior fossa is very dangerous may lead to death. Most common benign tumor was Schwannoma and most common malignant was Medulloblastoma.*
Keyword: *Posterior cranial fossa, medulloblastoma, pilocytic astrocytoma.*

Introduction

Posterior cranial fossa is a space situated between the foramen magnum and tentorium cerebelli. It includes cerebellum, pons and medulla oblongata. Posterior cranial fossa tumors can cause brainstem compression, Herniation and death are all risks in tumors which occur in this critical location. Tumors in the posterior fossa are considered critical brain lesions, because of the limited space within the posterior fossa and the potential involvement of vital brain stem nuclei.[1] A good percentage of

posterior cranial fossa tumors show a high morbidity and mortality in these patients. The factors contributing to high morbidityand mortality include late representation when the tumor haslocally infiltrated and metastasized outside the cranial cavityand tumor morphology like high grade astrocytoma, metastatic carcinoma.

Posterior cranial fossa tumors in children are differs from adults in their clinical presentation. Astrocytoma of same histological grade show a relatively better prognosis in children than in Adults.[2] In cases of pilocytic astrocytoma, complete resection is possible when the tumor is of small size and related to optic nerve. When these tumors have a bigger size and involve the deeper brain tissue, prognosis become less favorable.[3] The overall prognosis of patients with medulloblastoma has relatively improved nowdaysdue to radiotherapy and chemotherapy.[4]

The benign lesions like schwannoma at CP angle can be life threatening due to their location adjacent to vital structures. The advancement in radiological diagnostic techniques has resulted in detection of very small sizes lesions which is managed effectively the patient.[5]However, recurrences of benign lesions like meningiomas increase the morbidity and mortality.

This study is designed to determine the frequency andhistological types of posterior cranial fossa tumors.

Material and Methods

The specimens are collected at our department during January 2017 to May 2019.

The dataincluding age, sex, tumor site and histological diagnosis are taken.Patients more than 12 years were counted ad adult.The study comprises of 280 consecutive cases of posterior cranial fossa in all age groups.

Neurosurgical intervention was carried out in all these cases. After surgery, specimens were sent for histopathological evaluation and microscopic diagnosis was made.

Exclusion Criteria: Non-operated children and adults were excluded from this study.

The requisition form of patients presenting with posterior fossa tumors were received from department record from January 2017 to May 2019 and the data of patients along with histopathologicalreports were collected and studied.

Result

Total 280 cases received during study period.The gender distribution was 155(55.36%) male and 125(44.64%) female patients with male predominance. Among these patients, 194(69.29%) were adults and 86(30.71%) were children. Onhistological examination these (table 1) posterior cranialfossa tumors were identified.

The male to female ratio for each tumor is presented in Table 2 and the distribution with respect to age groups is discussed in Table 3 and Table 4.

Table 1: Distribution of posterior cranial fossa lesion by morphological type-

Morphological type	No.of cases(n)	Percentage (%)
Schwannoma	102	36.42
Medulloblastoma	37	13.21
Pilocytic astrocytoma	31	11.07
Epidermoid cyst	25	8.92
Meningioma	24	8.57
Hemangioblastoma	14	5.00
Metastatic carcinoma	11	3.92
GBM	7	2.50
Ependymoma	5	1.78
A-V malformation	4	1.42
Abscess	4	1.42
Arachnoid cyst	3	1.07
Low grade gliomas	3	1.07
Choroid plexus papilloma	2	0.71
AT/RT	1	0.36
Hemangiopericytoma	1	0.36
Oligodendrogliomas	1	0.36
Ependymal cyst	1	0.36
Colloid cyst	1	0.36
Tuberculosis	1	0.36
Neurocysticrcosis	1	0.36
Paraganglioma	1	0.36
Total	**280**	**100**

Table 2: Morphological distribution of posterior cranial fossa lesion by gender

Morphological type	Male	Female	M:F
Schwannoma	53	49	1.08:1
Medulloblastoma	28	9	3.1:1
Pilocytic astrocytoma	15	16	1:1.06
Epidermoid cyst	9	16	1:1.8
Meningioma	4	20	1:5
Hemangioblastoma	10	4	2.5:1
Metastatic carcinoma	8	3	2.66:1
GBM 4	6	1	6:1
Ependymomas	4	1	4:1
A-V malformations	2	2	1:1
Abscess	2	2	1:1
Others	14	2	7:1
Total	**155**	**125**	**1.24:1**

Table 3: Age wise distribution of posterior cranial fossa lesion

Age	≤20(children)	>20(adults)
no. of cases	86(31.71%)	194(69.29%)

Table 4: Morphological distribution of posterior cranial fossa tumor by age group

Morphological type	**Age group**	
	≤20(children)	**>20(adult)**
Schwannoma	6	96
Medulloblastoma	30	7
Pilocytic astrocytoma	24	7
Epidermoid cyst	5	20
Meningioma	2	22
Hemangioblastoma	1	13
Metastatic carcinoma	0	11
GBM 4	3	4
Ependymomas	3	2
A-V malformations	2	2
Abscess	3	1
Others	7	9
Total	**86**	**194**

Discussion

WHO guidelines were followed for histological classification of posterior cranial fossa tumors.[6]

In our study the frequency of posterior fossa SOL is more in male patients (155/280) which are similar to Mishra and Mahapatra studies.[7,8] Schwannoma was the commonest benign tumor 102 (36.42%) in our study. Although schwannoma occur in all age group but more common in adults. In our study 96/102 cases were present in adults, only 6 cases of schwannoma found in pediatric age groups. These findings were similar to study done by Dukkipati Kalyani et al.[9]

After development of modern imaging techniques, small sized schwannoma can be identified and it has greatly reduced morbidity and mortality. Large sized schwannoma are difficult to excise becausea part of tumor is firmly adherent to the brain stem. Treatment of schwannoma are surgical excision.

Medulloblastoma was found to be the predominant malignant brain tumor (37/280) in our study. This incidence is comparable with most other published studies .[10]It found more in pediatric age group (30/37). Intracranialneoplasms account for 20-25% of all pediatric malignancies in which medulloblastoma are most frequently malignant lesion. This was also comparable with other studies.[11, 12, 13]

Meningioma was seen in 24/280 cases (8.57%). Meningiomas are uncommon in pediatric age (2/24 cases) groups. In our study, one case of atypical meningioma (clear cell meningioma) was identified.

Pilocytic Astrocytoma was seen in 31/280 cases. It is also common in pediatric age group (24/31).[13]In our study, 7/31 cases found in older age. There is no significant variation in male female ratio.

Epidermoid cyst was seen in 25/280 cases.it found more in adults (20/25) and female patients (16/25) in our study.

In our study, 14/280 cases of hemangioblastoma found, more in male patient (10/14) and adults (13/14).

Certain tumors present in particular age group like metastatic carcinoma. It observed in older age groups (>40). All cases (11/280) are found older age in our study. The overall incidence of brain metastasis is more in male (8/11) patients in our study. The brain metastasis depands on patients age, more common in older age group.[14]

In our study, 7 cases of GBM, 5 cases of ependymomas, 4 cases of A-V malformations, 4 cases of abscess, 3 cases of each arachnoid cyst and low grade gliomas, two cases of choroid plexus papilloma, one case of each oligodendrogliomas, AT/RT, ependymal cyst,

colloid cyst, TB, neurocysticercosis, paraganglioma and hemangiopericytoma.

Early investigations and diagnosis is necessary to improve the overall prognosis survival of the patients with posterior cranial fossa tumors. Neurosurgical centers must have the ability to provide treatment options if to achieve optimal results for patients. Timely referral of the patient to specialized neurosurgical unit and oncological centers is recommended.

References

1. Al Shatoury HAH, Galhom AA, Engelhard H. Posteriorfossa tumors. Emedicine Neurosurgery.2008;(Publishedonline). [Cited on 2009 Apr 15]. Available from: http://emedicine.medscape.com/artcle/249495-overview.
2. Rickert CH, Probst-cousin S, Gullota F. Primary intracranial neoplasm of infancy and early child hood. Childs Nerv Syst. 1997;13: 507-13.
3. Brown MT, Feiedman HS, Oakes WJ et al. Chemotherapyfor pilocyticastrcytomas. Cancer. 1993;71: 3165-3172.
4. Friedman HS, Oakes WJ, Bigner SH et al. Medulloblastoma:Tumor biological and clinical perspectives. J Neurooncol. 1991; 11: 1-15.
5. Pollack IF. Pediatric brain tumours. SeminSurg Oncol.1999; 16: 73-90.
6. Kleihues P, Cavenee WK. Pathology and genetics oftumour of the nervous system. IARC Press Lyon. 2000.
7. Mishra BK, et al. Acute post-traumatic brain edema in children. NIMHANS J. 1984; 2:56.
8. Mahapatra AK. Head injury in children;A text book of head injury. Modern Publishers, New Delhi, 3rd edn, pp.151-171,2005.
9. Dukkipati Kalyani, S. Rajyalakshmi, O. Sravan Kumar.Clinicopathological study of posterior fossa intracranial lesions. J Med Allied Sci. 2 0 1 4;4(2):62-68.
10. Kadri H, Mawla A, Murad L. Incidence of childhood braintumors in Syria (1993–2002). PediatrNeurosurg. 2005;41:173–177.
11. Evan D. Allen, MD, Sharon E. Byrd, MD, Crystal F Darlingetal.The clinical and radiological evaluation of primary brain tumor in children, part1 clinical evaluation. J Nati Med Assoc.1993; 85:445-451
12. Nicolas R small, Katharine J, Drummond. The incidence of medulloblastoma and primitive neuroectodermal tumors in children and adults. Journal of clinical neuroscience. 2012;19(11):1541-44.
13. Preston-Martins S, Staples M, Farrugia H et al. Primary tumors of the brain, cranial nerves and cranial meninges in Victoria, Australia, 1982-1990: Pattern of incidence and survival. Neuroepidemiology, 1993; 12: 270-9.
14. Tasdemiroglu E, Patchell RA: Cerebral metastasis in childhood malignancies. ActaNeuroChir (Wien) 1997;139: 182-187.