ROLE OF MRI IN EVALUATION OF POSTERIOR FOSSA TUMOURS WITH HISTOPATHOLOGICAL CORRELATION

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ABSTRACT

Posterior fossa extends from tentorium cerebelli to foramen magnum and posterior fossa tumours are more common in children than in adults. Since posterior fossa is a critical location with limited space, even small tumours produce significant morbidity and mortality. The advent of Magnetic Resonance Imaging (MRI) has revolutionised the diagnosis and management of brain tumours.

OBJECTIVES

To study the demographic profile and assess the distribution, features, localisation, and extent of posterior fossa neoplasms by MRI and to correlate the tissue characterisation by MRI with that of histopathological examination.

MATERIALS AND METHODS

A prospective study was done on 90 patients who were diagnosed to have posterior fossa neoplasm by magnetic resonance imaging from January 2014 to November 2015. They were followed up till surgery or biopsy for confirmatory histopathological diagnosis. The final diagnosis were correlated followed by analysis of the present study by comparing with previous similar studies from various literature.

RESULTS

There was an overall male predominance with Male: Female ratio of 1.5:1. Among adults, extra-axial tumours (68%) were more frequent than intra-axial ones (32%) with vestibular schwannoma (37%) being the commonest lesion. Most common intra-axial tumour was metastasis (13%) and most common primary intra-axial tumour was haemangioblastoma (8%). Among paediatric age group, intra-axial tumours (83%) were commoner than extra-axial ones (17%) with low-grade astrocytoma (38%) as the commonest lesion followed by medulloblastoma (29%) and ependymoma (17%). Overall, 6 cases were misdiagnosed by MRI as glioma and turned out to be tuberculoma [2], abscess [2], medulloblastoma [1], and metastasis [1] at HPE.

CONCLUSION

MRI proves to be a valuable modality of imaging in accurately evaluating the morphologic distribution of various intra- and extra-axial tumours in the posterior fossa. MRI can correctly diagnose 100% of extra-axial tumours and 85% of intra-axial lesions. Main tumour mimics of posterior fossa are tuberculoma and pyogenic abscess.

KEYWORDS

Posterior Fossa Tumours, MRI, Adult, Paediatric Age.

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INTRODUCTION

Brain tumour is the second most common form of malignancy in children and primary brain tumours rank from 6th to 8th in frequency of all neoplasms in the adults.⁽¹⁾ Posterior fossa extends from tentorium cerebelli to foramen magnum and posterior fossa neoplasms are more common in children than in adults. Posterior fossa tumours account for 54% to 70% of all childhood brain tumours and about 15-20% of adult brain tumours.^(1,2) Infratentorial neoplasms can be classified as intra-axial or extra-axial based on location.

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Common Posterior FOSSA Tumours

Adults (Extra-axial>Intra-axial)	Children (Intra-axial>Extra-axial)
<ul style="list-style-type: none"> Schwannoma Meningioma Epidermoid Metastases Haemangioblastoma Choroid plexus papilloma Arachnoid cysts 	<ul style="list-style-type: none"> Primitive Neuroectodermal Tumour (PNET), Medulloblastoma Astrocytoma Ependymoma Oligodendroglioma Haemangioblastoma Lymphoma Atypical Teratoid Rhabdoid Tumour (ATRT)

Since posterior fossa is a critical location with limited space, even small tumours produce significant morbidity and mortality. Majority of these tumours present with nonspecific

signs and symptoms such as ataxia, vomiting, headache, stroke-like syndromes, or hearing/visual disturbances and often a diagnosis is made or suggested initially by the findings on imaging studies. The advent of Magnetic Resonance Imaging (MRI) has revolutionised the diagnosis and management of brain tumours.

The aim of the study is to describe the demographic profile, assess the distribution, features, localisation, extent of posterior fossa neoplasms by MRI, and to correlate the tissue characterisation by MRI with that of histopathological examination.

MATERIALS AND METHODS

A prospective study was done on 90 patients who were diagnosed to have posterior fossa neoplasm by MRI in the Department of Radiodiagnosis, SRM Medical College Hospital and Research Centre, from January 2014 to November 2015. They were followed up till surgery or biopsy for confirmatory histopathological diagnosis except 7 of them who had multiple metastases with a known primary.

Patients with infratentorial pathology due to infections, congenital malformations, trauma, or cerebrovascular accidents and patients with MRI incompatible devices and claustrophobia were excluded.

The paediatric patients were given sedatives (syp. trichlorophos, inj. midazolam) as and when required by anaesthesiologist. All the MRI scans were performed using 1.5 Tesla Siemens Magnetom Essenza MR machine. Pre-contrast images were taken followed by postcontrast images with intravenous administration of 0.1 mmol/kg of body weight of gadolinium. The standard imaging protocol used was Pre-contrast - Axial - T1WI, T2WI, FLAIR, DWI, GRE, MPR, sagittal - T1WI and coronal - T2WI. Post-contrast - axial, sagittal, and coronal - T1WI and MPR with slice thickness of 5 mm and interslice gap of 2.5 mm.

The age of the patient, intra-axial or extra-axial location of the tumour, single or multiple lesions, location within the neuraxis, signal intensity on various MRI sequences including Diffusion Weighted Imaging (DWI), contrast enhancement pattern, and presence or absence of haemorrhage, calcification, and necrosis were considered for the diagnosis of tumour. The MRI and histopathological diagnosis were correlated followed by analysis of the present study by comparing with previous similar studies from various literature.

RESULTS

The MRI patterns of posterior fossa tumours in 90 patients were studied and correlated with Histopathological Examination (HPE). There was an overall male predominance with the Male:Female ratio of 1.5:1. MRI exactly diagnosed the lesion as neoplasm in 86 patients and misdiagnosed 4 infective lesions as neoplasm. In further characterising the

type of neoplasm, MRI was inaccurate in 2 out of 86 patients. Overall, 6 cases misdiagnosed by MRI as glioma turned out to be tuberculoma [2], abscess [2], medulloblastoma [1], and metastasis [1] at HPE.

Among adults, extra-axial tumours (68%) were more frequent than intra-axial ones (32%) with vestibular Schwannoma (37%) being the commonest lesion. Other adult extra-axial tumours were epidermoid (10%), meningioma (10%), arachnoid cyst (3%), dermoid (3%), metastasis, craniopharyngioma, and chordoma. Most common intra-axial tumour was metastasis (13%) and most common primary intra-axial tumour was haemangioblastoma (8%). Other adult intra-axial tumours were astrocytoma (5%), medulloblastoma, intraventricular epidermoid, and choroid plexus papilloma.

Among paediatric age group, intra-axial tumours (83%) were commoner than extra-axial ones (17%) with low-grade astrocytoma (38%) as the commonest lesion followed by medulloblastoma (29%) and ependymoma (17%). 4 paediatric extra-axial lesions were seen each of schwannoma, arachnoid cyst, craniopharyngioma, and pinealoblastoma.

Age in Years	Male		Female		Total	
	No.	%	No.	%	No.	%
0-18	19	79	5	21	24	28
19-30	5	38	8	62	13	15
31-40	6	43	8	57	14	16
41-50	9	53	8	47	17	20
51-60	10	83	2	17	12	14
>60	3	50	3	50	6	7
Total	52	60	34	40	86	100

Table 1: Age and Sex Distribution

Sl. No.	Extra-Axial	No.	Intra-Axial	No.
1.	Schwannoma	24	Astrocytoma	12
2.	Epidermoid	6	Medulloblastoma	8
3.	Meningioma	6	Metastasis	8
4.	Arachnoid Cyst	3	Haemangioblastoma	5
5.	Dermoid	2	Ependymoma	4
6.	Craniopharyngioma	2	IV Epidermoid	2
7.	Metastasis	1	Choroid Plexus Papilloma	1
8.	Chordoma	1		
9.	Pinealoblastoma	1		
	Total	46		40

Table 2: Compartmental Distribution of Posterior Fossa Tumours

Tumours	Location	Number	T1 Hypointense	T1 Isointense	T2 Isointense	T2 Hyperintense	Cystic Areas	Enhancement +	Hydrocephalus	DWI- Restriction	Others
Schwannoma	L-CPA	13	10	3	2	11	10	13	9	-	2HE, 1CA
	R-CPA	11	9	2	2	9	7	11	5	-	1HE
Epidermoid	L-CPA	2	2	-	-	2	2	-	2	2	-
	R-CPA	4	4	-	-	4	4	-	3	4	-
	IV	2	2	-	-	2	2	-	2	2	-
Meningioma	CC	3	1	2	1	2	-	3	3	3	1DT
	FO.MA	1	-	1	1	-	-	1	-	1	DT
	L-CPA	1	-	1	1	-	-	1	1	1	1CA
	TEN	1	-	1	1	-	-	1	1	1	-
Dermoid	L-CPA	1	1	-	-	1	1	1	1	1	CA,F
	R-CPA	1	-	-	-	-	1	1	-	-	CA,F
Arachnoid Cyst	L-CPA	2	2	-	-	2	2	-	2	-	-
	R-CPA	1	1	-	-	1	1	-	-	-	-
Metastasis	L-CPA	1	1	-	-	1	-	1	1	1	N
Craniopharyngioma	SS	2	1	1	-	2	2	2	2	-	2CA
Chordoma	CLIVUS	1	-	1	-	1	1	1	1	-	CA
Pinealoblastoma	PINEAL	1	1	-	-	1	-	1	1	1	CA,N

Table 3: Imaging Characteristics of Extra-Axial Lesions

R - Right, L - Left, CPA - Cerebellopontine Angle, CC - Cerebellar Convexity, IV - Intraventricular (4th ventricle), SS - Suprasellar, TEN - Tentorial, FO.MA - Foramen magnum, N - Necrosis, CA - Calcification, HE - Haemorrhage, DT - Dural tail, F - Fat.

Tumours	Location	Number	T1 Hypo/Isointense	T2 Isointense	T2 Hyperintense	Cystic Areas	Flair Oedema	Enhancement	Hydrocephalus	DWI- Restriction	Others
Astrocytoma (12)	L-CBH	4	3	-	3	3	3	4	3	-	1MN
	R-CBH	1	1	-	1	1	1	1	1	-	1CA
	VERM	5	5	-	5	5	4	5	5	-	1CA,3MN
	I.V+VE	1	1	-	1	1	1	1	1	-	1CA
	PO+MB	1	1	-	1	-	1	1	1	-	-
Metastasis (8)	L-CBH	4	4	-	4	-	4	4	4	-	MU
	R-CBH	3	3	-	3	1	3	3	3	2	1H,1N,MU
	VERM	1	1	-	1	-	1	1	1	-	-
Medulloblastoma (8)	L-CBH	1	1	-	1	1	1	1	1	1	-
	VERM	5	5	3	2	1	5	5	5	5	1HE,1CD
	I.V+VE	2	2	-	2	1	2	2	2	2	1HE
Haemangioblastoma (5)	R-CBH	3	3	-	3	3	2	3	2	-	-
	L-CBH	2	2	-	2	2	-	2	2	-	1MU
Ependymoma (4)	I.V.	2	2	-	2	2	1	2	1	-	2CA
	I.V +EX	2	2	-	2	2	-	2	2	-	1CA
Choroid Plexus Papilloma (1)	I.V.	1	1	-	1	-	-	1	1	1	-

Table 4: Imaging Characteristics of Intra-Axial Lesions

R - Right, L - Left, IV - Intraventricular (4th ventricle), VE - Vermis, IV+EX - Intraventricular with Foraminal Extension, CBH - Cerebellar Hemisphere, PO - Pons, N - Necrosis, CA - Calcification, MN - Mural Nodule, MU - Multiple, HE - Haemorrhage, CD - CSF Dissemination, MB - Midbrain.

Age In Years and Sex	Site	T1 Intensity	T2 Intensity	Heterogeneity	Cystic Areas	Mild-To Mod Enhan.	Oedema-Flair	Restriction-DWI	Hydrocephalus	MRI Diagnosis	HPE Diagnosis
2M	L-CBH	HYPO	HYPER	+	+	+	+	+	+	HGG	AB
22M	VE	HYPO	HYPER	+	+	+	+	-	+	LGG	AB
28M	L-CBH	HYPO	HYPER	+	+	+	-	-	+	LGG	TB
16M	L-CBH	HYPO	HYPER	+	+	+	+	-	+	LGG	TB

Table 5: Imaging Characteristics of Tumour Mimics

LGG – Low-grade glioma, HGG – High-grade glioma, AB - Abscess, TB - Tuberculoma, CBH - Cerebellar hemisphere, VE - Vermis, L - Left, M - Male.

Sl. No.	Lesions	HPE Diagnosis	MRI Diagnosis
1.	Schwannoma	24	24
2.	Astrocytoma	12	18
3.	Metastasis	9	8
4.	Medulloblastoma	8	7
5.	Epidermoid	8	8
6.	Meningioma	6	6
7.	Haemangioblastoma	5	5
8.	Ependymoma	4	4
9.	Arachnoid Cyst	3	3
10.	Craniopharyngioma	2	2
11.	Dermoid	2	2
12.	Choroid Plexus Papilloma	1	1
13.	Chordoma	1	1
14.	Pinealoblastoma	1	1
15.	Abscess	2	-
16.	Tuberculoma	2	-

Table 6: HPE and MRI Correlation

Sl. No.	Age In Years/Sex	MRI Diagnosis	HPE Diagnosis
1.	22/M	LGG	Abscess
2.	28/M	LGG	Tuberculoma
3.	4/M	HGG	Medulloblastoma
4.	2/M	HGG	Abscess
5.	34/F	LGG	Metastasis
6.	16/M	LGG	Tuberculoma

Table 7: Cases Misdiagnosed by MRI

M - Male, F - Female, LGG – Low-grade glioma, HGG – High-grade glioma.

Graph 1: Distribution of Intra-Axial Lesions in Paediatric Age Group

Graph 2: Distribution of Intra-Axial Lesions in Adults

Graph 3: Distribution of Extra-Axial Lesions in Adults

Fig. 1: Vestibular Schwannoma. Axial T2WI and T1 Post-Contrast Images show Heterogeneous Lesion with Cystic Areas and Enhancing Solid Component in the Left Cerebellopontine Angle causing Mass Effect on the Pons and Cerebellum and Extending into Left Internal Acoustic Canal

Fig. 2: Pilocytic Astrocytoma. Axial T1WI, T2WI, T1 Post-Contrast and GRE Images show Heterogeneous Lesion with Rim Enhancing Cystic Areas, Enhancing Solid Component, and Haemorrhage with Fluid Level in the Vermis Causing Mass Effect on the Fourth Ventricle

Fig. 3: Intraventricular Epidermoid. Images show Intraventricular Lesion-Appearing Hyperintense on Axial T2WI, no Enhancement in T1 Post-Contrast, not Suppressed in FLAIR and showing Restriction in DWI

Fig 4: Multiple Haemangioblastomas. Axial and Coronal T1 Post-Contrast Images show Multiple Intra-Axial Cystic Lesions with Avidly Enhancing Mural Nodule in Cerebellar Hemispheres

Fig. 5: Vermian Lesion. MRI Diagnosis - Low-Grade Glioma. HPE Diagnosis - Tuberculoma. Sagittal T1 Pre-Contrast and Coronal T2 Post-Contrast Images show Vermian Cystic Lesion with Enhancing Wall and Septations. HPE (H and E) Images show Multiple Caseating Granuloma Composed of Epithelioid Cells, Langhans Giant Cells, Lymphocytes, and Fibroblasts

Fig: 6: Left Cerebellar Hemispheric Tumour. MRI Diagnosis - High-Grade Glioma. HPE Diagnosis - Medulloblastoma. Axial T1WI and T2WI show Predominantly Solid Lesion with Necrosis Involving the Left Cerebellar Hemisphere causing Mass Effect on the Pons and 4th Ventricle. HPE (H and E) Images show a Neoplasm Composed of Small Cells with Elongated Nuclei and Scant Cytoplasm Arranged in Nests and Nodular Pattern with Nodules Surrounded by Desmoplastic Stroma

DISCUSSION

Posterior fossa is the site for multiple diseases ranging from tumours, cysts, vascular lesions to infections. MRI is commonly used for morphologic and tissue characterisation

because of greater anatomic detail in multiple planes, better delineation of relationship of tumour to adjacent structures and detection of haemorrhage, necrosis, solid, or cystic components.

In our study, among 90 patients with MRI diagnosis of posterior fossa neoplasm, 4 were confirmed to be of infective pathology by HPE. Among total of 86 cases of posterior fossa neoplasm, 52 (60%) were males and 34 (40%) were females, 62 were adults with 33 (53%) males and 29 (47%) females and 24 were of paediatric age with 19 (79%) males and 5 (21%) females. There was male predominance and it correlated with similar other studies.

Totally, 6 cases (4 infective lesions and 2 neoplasms) were diagnosed wrongly by MRI as glioma, which were found to be tuberculoma [2], abscess [2], medulloblastoma [1], and metastasis [1] at HPE. This may be due to general increased incidence of glioma, overlapping clinical and imaging features of glioma with other lesions in conventional MRI.

The 4 infective lesions, which were diagnosed as tumours by imaging were T1 hypointense, T2 hyperintense with variable enhancement, and 1 lesion showed diffusion restriction. MRI diagnosed 3 as low-grade glioma and 1 as high-grade glioma. This may be due to similar appearance of both the infective and neoplastic pathology in imaging. Even DWI cannot differentiate these two pathologies at some instances.^(3,4)

Two neoplastic lesions were characterised wrongly by MRI. A moderately enhancing heterogeneous lesion with diffusion restriction, perilesional oedema, and mass effect in left cerebellar hemisphere of 4 years male child was diagnosed as high-grade glioma by MRI, but turned out to be medulloblastoma at HPE. Another 34 years female patient with no known primary showed a single moderately enhancing heterogeneous lesion without diffusion restriction or significant perilesional oedema in the left cerebellar hemisphere and was diagnosed as low-grade glioma, but found to be metastatic adenocarcinoma at HPE.

There was difference in the distribution of posterior fossa tumours between adult and paediatric age groups with extra-axial lesions more common in adults and intra-axial lesions more common in paediatric population. In our study, there was over all predominance of extra-axial lesions and this was due to increased number of adult patients. Vestibular schwannoma was the most common extra-axial lesion and it correlated well with all other similar studies. Many studies reported meningioma as the second most common tumour followed by epidermoid. But our study showed equal number of meningioma and extra-axial epidermoid with two intraventricular epidermoid. Three common intra-axial lesions in descending order of frequency in adults include metastasis (13%), haemangioblastoma (8%), and astrocytoma (5%).

Schwannoma is a benign nerve sheath tumour and can occur along any cranial nerve. Vestibular schwannoma arise principally from the vestibular division of the eighth nerve and is a common cerebellopontine angle cistern tumour seen in the fourth to sixth decades with sensorineural hearing loss and other symptoms. Bilateral lesions are common with neurofibromatosis (NF 2) and are seen with meningiomas and ependymomas (MISME).⁽⁵⁾ On MRI, they are isointense or mildly hypointense on T1WI and mildly hyperintense on T2WI with variable enhancement. They maybe

heterogeneous due to necrosis, haemorrhagic components, and occasional calcification.⁽⁶⁾ Widening of internal auditory canal is an important finding.

Meningiomas predominantly occur in 40 to 60 years age group with female predominance. Around 10% of meningiomas occur in posterior fossa. They exhibit typical features of extra-axial tumours extremely variable on T2WI and either isointense or slightly hypointense to brain on T1WI. Calcification, haemorrhage, and cystic foci cause heterogeneity. The presence of a "dural tail" on contrast enhanced MRI is highly suggestive, but not pathognomonic of meningioma. Usually, homogenous and intense enhancement is seen.

Epidermoid tumours arise from epithelial cell rests in the basal cisterns and are commonly seen in 2nd to 4th decade of life. They show slightly higher signal than CSF on both T1 and T2-weighted images and are not suppressed completely in FLAIR. They do not enhance with contrast. The cystic contents of epidermoids often exhibit restricted diffusion on DWI⁽⁷⁾ helping to differentiate from arachnoid cyst, which does not show diffusion restriction.

Metastasis is the most common intra-axial posterior fossa tumour in adults may occur to parenchyma, leptomeninges, dura, and calvaria. Usually, they are hyperintense on T2WI with variable enhancement. Cystic degeneration, haemorrhage, or necrosis maybe seen. Typically, disproportionate, and extensive vasogenic oedema exists with metastases.

Haemangioblastoma represents about 7-12% of all posterior fossa tumours seen predominantly in 30 to 40 years and males. About 20% are associated with Hippel-Lindau disease in which multiple lesions are seen with endolymphatic sac tumour. The cerebellum and vermis are the common sites, but can also be found in the medulla and spinal cord. The classic MR appearance of haemangioblastoma is a cystic mass with a brightly enhancing nodule. Calcification is rare. The tumour nodules are hypervascular and the vascular pedicle often produces a characteristic flow void on MR.

Astrocytoma arises from astrocytes and is the most common glial tumour. Cerebellar astrocytoma accounts for more than 10% of paediatric intracranial tumours and 25% of all posterior fossa tumours of children.⁽⁸⁾ Average age at presentation is 9 years. They tend to be lower grade (mostly pilocytic variety) than the supratentorial variety found in adults. The tumour maybe located medially in the vermis or laterally in the cerebellar hemisphere. More than 50% of cerebellar astrocytomas are cystic. Both solid tumour and cyst are bright on T2-weighted images and juvenile pilocytic astrocytomas have higher ADC values ($>1.4 \times 10^3 \text{ mm}^2/\text{s}$) than medulloblastoma and ependymoma.⁽⁹⁾ Calcification is occasionally present. Peritumoral oedema is not pronounced.

Primary cerebellar Glioblastoma Multiforme (GBM) is a high-grade glioma with majority have decreased T1W, increased T2W signal intensities, and significant perilesional oedema, haemorrhage maybe seen. On contrast, moderate-to-marked heterogeneous ring-like enhancement suggesting intratumoral necrosis is usually seen. Multicentric/multifocal lesions or extra-axial metastases can be seen.

Brainstem gliomas usually present with cranial nerve palsy most often involving the 6th or 7th nerves. The pons is the common location and usually has infiltrative nature with

peak incidence between 3 and 10 years. They appear hypointense on T1WI and hyperintense on T2WI and FLAIR with variable enhancement. Tectal glioma is a relatively benign tumour and presents with symptoms of obstructive hydrocephalus with good prognosis.⁽¹⁰⁾ The presence of irregular areas of haemorrhage, necrosis, or enhancement should suggest a more aggressive neoplasm such as anaplastic astrocytoma or glioblastoma with tectal involvement.

Ependymomas constitute 2 to 6 percent of all gliomas and they arise from ependymal cells lining the ventricles. Peak age range is 1-5 years, but second small peak occurs in mid-thirties with M:F ratio of 2:1. About 70% of ependymomas are found in the 4th ventricle. Plastic ependymoma can mold itself to the available spaces without adhering to the ventricle through the foramina of Luschka and Magendie into the basal cisterns. Ventricular and subarachnoid seeding are not infrequent. Most ependymomas arise in the floor of the fourth ventricle. Calcification is present in 50% cysts, haemorrhage and necrotic areas are common and most are moderately vascular. On MRI, the solid component of ependymoma appears hypo- to isointense on T1WI, hyperintense on T2WI with variable enhancement and usually do not show diffusion restriction due to low cellularity.

Choroid plexus papilloma and carcinoma represent 0.4-0.6% of all intracranial tumours. They have predilection for the trigone of lateral ventricle in children and the fourth ventricle in adults. Hydrocephalus is due to increased production of CSF and obstruction. Calcification and cystic degeneration can be seen. On MRI, CPPs are seen as lobulated masses usually isointense to brain on T1W1 and iso to slightly hyperintense on T2W1. They enhance intensely and homogeneously.⁽¹¹⁾ Spinal drop metastasis can occur.⁽¹²⁾ Symptoms are due to hydrocephalus or parenchymal invasion. Signal characteristics and enhancement do not distinguish benign from malignant.

Medulloblastoma initially arises in the inferior medullary velum and grow to fill the fourth ventricle infiltrating the surrounding structures. Common between 4 to 8 years with M:F ratio of 3:1. They are primarily midline vermian lesions, but hemispheric locations are also possible. Necrosis, haemorrhage, cavitation, and CSF dissemination are common features. Calcification is rare in medulloblastomas. Two important MR findings are low signal intensity of the solid portion in T2 and restricted diffusion.⁽¹³⁾ They commonly dislocate the superior medullary velum superiorly compared to ependymoma and astrocytoma, which commonly dislocate the superior medullary velum anteriorly or inferiorly.⁽¹⁴⁾

Other less common posterior fossa tumours include dermoid (fat-containing lesion), arachnoid cyst (CSF intensity in all sequences), glomus jugulare, chordoma, atypical teratoid/rhabdoid tumour, subependymoma, solitary fibrous tumour, lymphoma, dysplastic cerebellar gangliocytoma (Lhermitte-Duclos Disease) and ganglioglioma.^(15,16)

Non-neoplastic conditions that can mimic tumours in imaging are infections - abscess, tuberculoma, encephalitis; vascular lesions - vascular malformations, aneurysms, infarction, haematoma; demyelinating disease and sarcoidosis. These entities are most often differentiated on the basis of clinical findings, the acuteness of the illness and by imaging.⁽³⁾

The main stay of treatment for primary posterior fossa neoplasms whenever possible is complete surgical excision. Adjuvant therapy includes chemotherapy and radiotherapy.

This was a comprehensive prospective study including all age groups and various types of posterior fossa tumours with histopathological correlation. Various MRI sequences were used including GRE and DWI, however, main limitation of this study was lack of use of advanced MRI tools like perfusion weighted imaging and MR spectroscopy that can be of help for accurate tissue characterisation.⁽¹⁷⁾

CONCLUSION

MRI proves to be a valuable modality of imaging in accurately evaluating the morphologic distribution of various intra- and extra-axial tumours in the posterior fossa.

MRI can correctly diagnose 100% of extra-axial tumours and 85% of intra-axial lesions. Main tumour mimics of posterior fossa are tuberculoma and pyogenic abscess.

Advanced MRI techniques like MR spectroscopy may help in better tissue characterisation, hence in the armamentarium of non-invasive techniques, MRI becomes the mainstay of investigation from the view point of diagnostic and prognostic accuracy and safety.

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