Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2015; 3(1A):5-9 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2015.v03i01.002

Research Article

Study of Cases of Intracranial Meningioma during April to September, 2014 - At PDU Govt. Medical College & Civil Hospital, Rajkot, Gujarat, India

Maulik C. Jethva[1*], Anjana Trivedi[2], Manisha Panchal[3], Jay Thakkar[4]
[1]Assistant Professor, [2]Professor and Head, [4]2nd Year Resident, Radiology Department, PDU Govt. Medical College & Civil Hospital, Rajkot, Gujarat, Pin: 360007, India
[3]Assistant Professor, Medicine Department, PDU Govt. Medical College & Civil Hospital, Rajkot, Gujarat, Pin: 360007, India

***Corresponding author**
Dr. Maulik C. Jethva
Email: jethvamaulikking@gmail.com

Abstract: Meningiomas are the second most common primary neoplasm of the central nervous system & accounting for approximately 15-20% of primary intracranial tumors. Here we have collected diagnosed cases of meningiomas during past six months on CT scan & MR imaging modalities mainly. Age wise, Gender wise, Location wise & Pathological nature wise prevalence of the meningiomas diagnosed during this period has been evaluated & highlighted their epidemiological profile, clinical features & radiological findings in detail. We have also evaluated usefulness of CT scan & MR imaging modalities for accurate diagnosis of intracranial meningiomas in detail with their imaging characteristics.
Keywords: Meningioma, Common intracranial neoplasm, Extra axial brain tumor, Primary intracranial neoplasm.

INTRODUCTION

Meningiomas are the second most common primary neoplasm of the central nervous system, arising from the arachnoid "cap" cells of the arachnoid villi in the meninges. These tumors are usually benign in nature; however, they can be malignant. Meningioma is accounting for approximately 15-20% of primary intracranial tumors. Meningiomas may occur intracranially or within the spinal canal. Risk factors for the development of meningiomas include the diagnosis of neurofibromatosis type two (NF-2) and a history of radiation therapy, the so-called radiation- induced meningiomas. Meningiomas in children have been considered by some to be more aggressive than their adult counterparts. Here we have collected diagnosed cases of meningiomas during past six months on CT scan & MR imaging modalities. Age wise, Gender wise, Location wise & Pathological nature wise prevalence of the meningiomas during the six months have been evaluated in detail.

Objectives

- To diagnose the intracranial tumor - Meningioma accurately on the basis of mainly CT scan & MR imaging modalities with pathological correlations if available.
- To do retrospective analysis of its epidemiological profile, clinical features, radiological findings like - its location, signal intensity, enhancement pattern, internal hemorrhage & calcification, surrounding edema & invasion etc. with detailed follow up.

MATERIALS AND METHODS

We have included & analyzed the cases of Meningioma, which were diagnosed primarily on CT scan & MR imaging modalities at over PDU govt. Medical College & Civil hospital, Rajkot, Gujarat, India; during the time interval of April to September, 2014. Some cases were confirmed by operative and histopathological findings also. We have retrospectively analyzed the epidemiological profile, clinical features, radiological findings, type of excision, histopathological findings and overall management profile of these patients. As and where possible, we have made an attempt to determine the differentiating features between meningiomas & other brain tumours & tumour like conditions.

RESULTS

Overall tumor incidence

We have diagnosed almost 60 cases of all primary or secondary brain tumors during past 6 month interval on CT scan &/ or MR imaging modalities, out of them 18 cases were diagnosed as intracranial Meningioma. So its overall incidence is 30 %.

Age & Sex incidence

Age of diagnosis varied from 28 years to 83 years in our study, most of them were from 5th to 6th

decade. Out of 18 cases, 11 patients were female & 7 patients were male. So Male: Female ratio is approx. 4:6.

Location wise incidence

Out of 18 cases of intracranial meningioma - 15 cases were supratentorial and 3 case were infratentorial in location. The tumors were located adjacent the cerebral convexity in 4 patients, parafalcine in 4 cases, adjacent skull base in 2 cases, adjacent tentorium in one case, at optic nerve sheath in one case and at posterior fossa in 3 cases. Multiple meningiomas were found in 3 cases.

Presenting common symptoms and signs

The most common presenting symptoms were due to raised intracranial pressure or seizure. The main presenting symptoms were seizure (8 patients), headache (6 patients), impairment of vision (2 patients), vomiting (3 patients), proptosis (2 patients), increased head size (1 patient) and occipital swelling (1 patient). The most common clinical sign seen was papilledema (7 patients) followed by monoparesis (4 patients), marked impairment of vision (2 patients), proptosis (2 patients), tense anterior fontanelle (1 patient) & occipital swelling (1 patient).

Radiological imaging modalities

Radiological imaging modalities were done to diagnose the cases such as plain X-ray of skull (1 patient with calcified tumor), CT scan (6 patients), MRI (7 patients) and MRI with screening CT scan (5 patients).

Radiological imaging characteristics of Meningioma

Tumor lesions were well-defined homogenous in appearance in most of the cases on CT scans/MRI studies. Intra-tumoral calcification was seen in most of the cases. Intra-tumoral cystic changes were seen in two cases. Most of the tumor lesions showed intense homogenous enhancement on post contrast study. In only one case significant peritumoral edema was noted. No any intracranial or extracranial metastasis was observed in any of the cases.

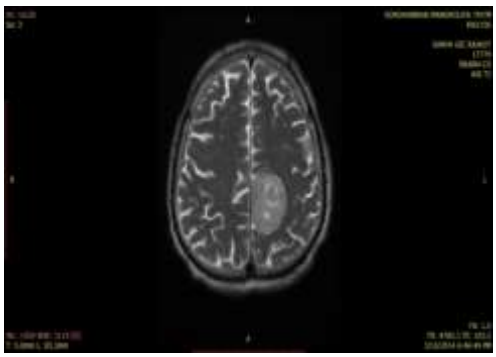

Fig. 1: MRI: T2WI - Left parasagittal Meningioma

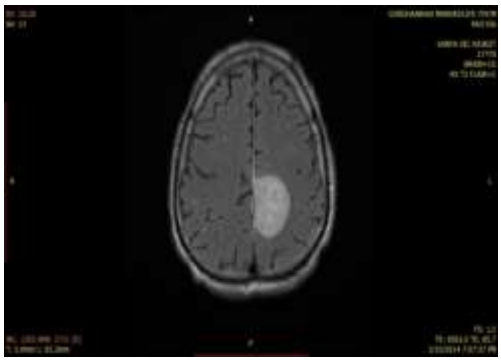

Fig. 2: MRI: T2 Flair Contrast (Same patient)

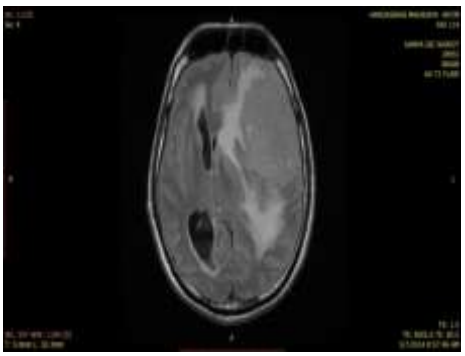

Fig. 3: MRI: T2 Flair image - Left frontoparietal convexity Meningioma

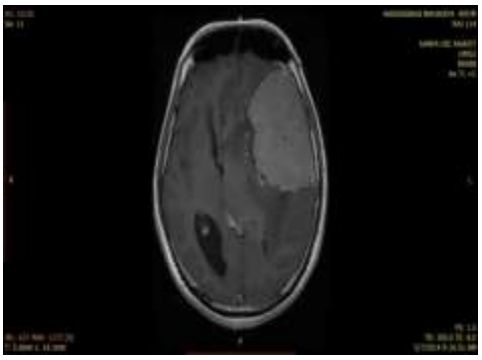

Fig. 4: MRI: T1W post-contrast (Same patient)

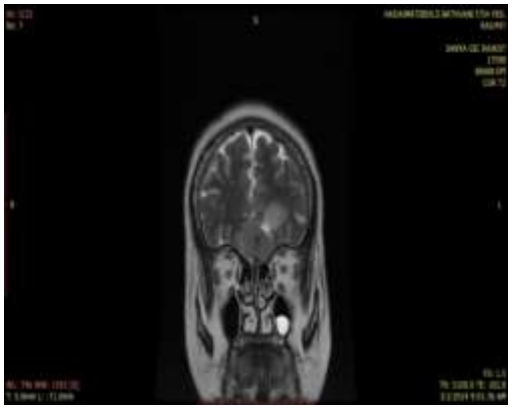

Fig. 5: MRI: Coronal T2W image - parasagittal Meningioma

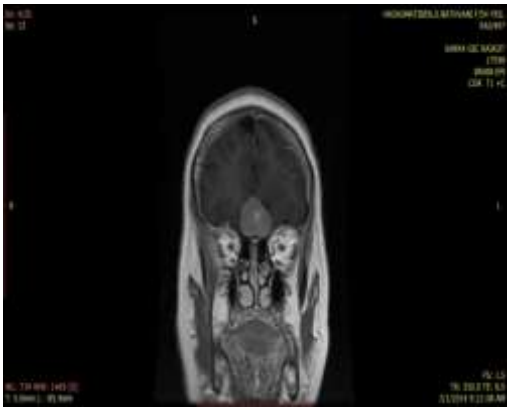

Fig. 6: MRI: T1W post-contrast (Same patient)

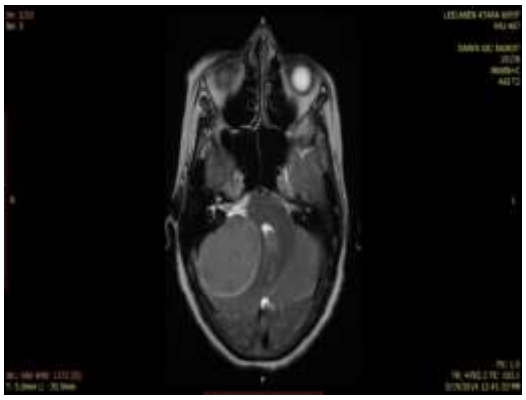

Fig.7: MRI: T2W image - CP angle Meningioma

Fig. 8: CT scan plain – Parietal convexity Calcified Meningioma

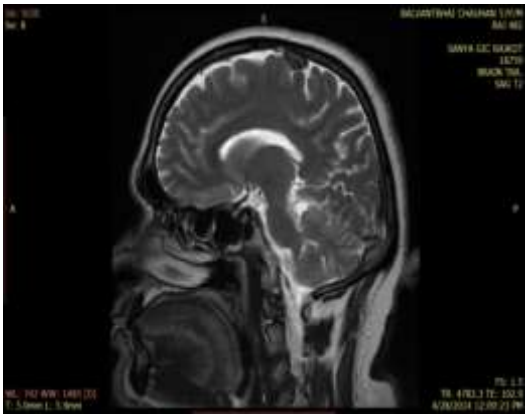

Fig. 9: MRI: Sagittal T2W image (Right high parietal Meningioma)

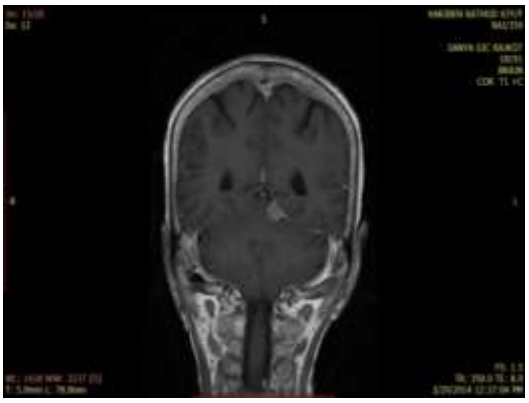

Fig. 10: MRI: Coronal T1W post-contrast image (Left tentorial leaflet Meningioma)

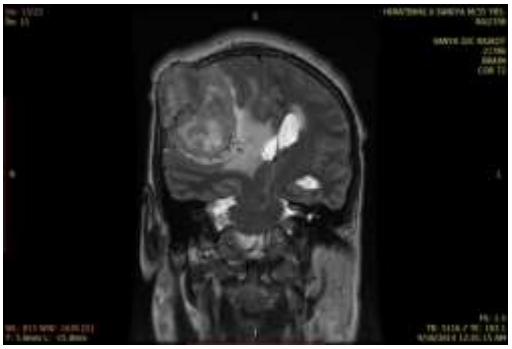

Fig. 11: MRI: Coronal T2W image – Right parietotemporal Meningioma

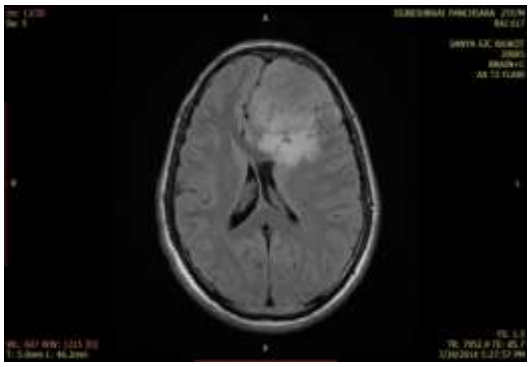

Fig. 12: MRI: T2 Flair post-contrast - Left frontal convexity convexity Meningioma

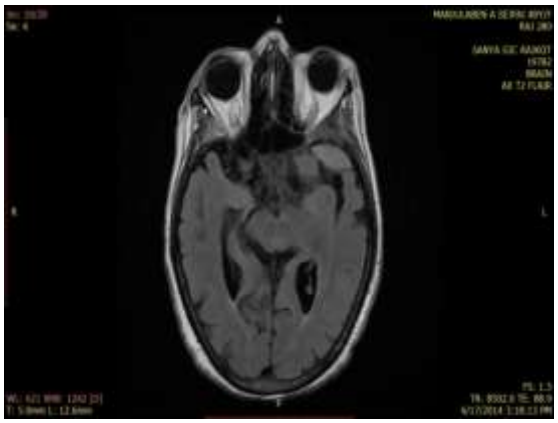

Fig. 13: MRI: T2W Flair image - Left anterior temporal convexity Meningioma

Fig. 14: MRI: Axial T1W post-contrast image – Right optic nerve sheath Meningioma

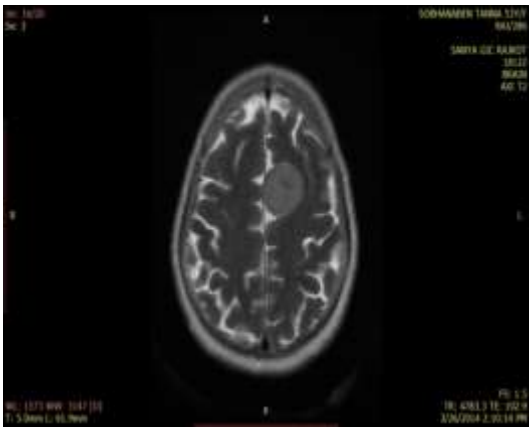

Fig. 15: MRI: T2W image left parasagittal Meningioma

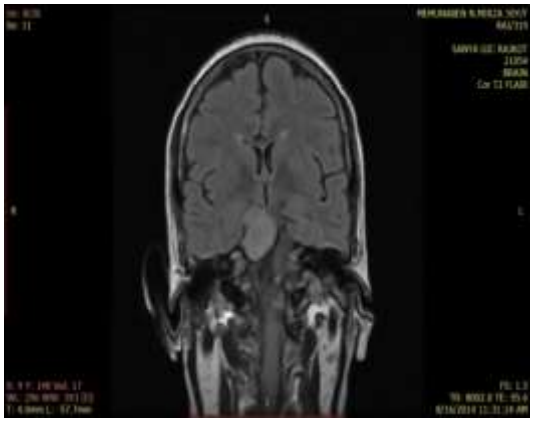

Fig. 16: MRI: Coronal T2 flair image - Right sphenoid wing Meningioma

DISCUSSION

Meningiomas are the most common primary extra axial nonglial intracranial tumor [1]. Meningiomas are more common in women, with a ratio of 2:1 intracranially and 4:1 in the spine. They are uncommon in patients before the age of 40 and should raise suspicion of neurofibromatosis type 2 (NF2) when found in young patients [2]. There is a close relationship between the location of the arachnoid granulations and the prevalent sites of origin for Meningiomas [3]. Locations of Meningiomas in descending order are as follows: Falx & parasagittal, convexity, sphenoid wing, olfactory groove, suprasellar, posterior fossa, intraventricular, intraorbital & spinal. MR imaging is superior to CT scan for detailed evaluation of all aspects of meningioma but calcifications & bony changes are better seen on CT scan [4,5]. On CT scan the meningiomas are mostly hyperdense to cerebral parenchyma. On MRI - T1 weighted images, meningiomas are mostly hypointense in the comparison with cerebral white matter & on T2 weighted images, they are usually hyperintense to it. Mostly the tumor is homogeneous but sometimes heterogeneity is detected within tumor due to calcifications, vascularity & rarely cystic – necrotic areas. Broad dural based margin & adjacent bony hyperostosis are highly suggestive of meningioma. The most important and highly specific characteristic for extraaxial localization is the identification of various anatomic interfaces interposed between the tumor surface and the brain surface. Four different anatomic interfaces may be identified with MR: pial vascular structures, CSF clefts, brain cortex, and dural margins. With high-resolution and multiplanar MR, one or more of these interfaces can usually be identified in essentially all cases [4]. CSF interfaces are identifiable in about 80% of meningiomas on MRI; they appear as high-intensity clefts on T2-weighted sequences relative to the adjacent tumor and brain. In comparison with CT, MR is superior for extraaxial localization of the tumor. CT without and with contrast can define these interfaces in less than 50% of the cases in which they are identified on MRI [4]. Internal tumor vascularity and arterial encasement are well demonstrated on MR and

are usually not detectable with CT [4, 6]. Brain edema develops in approximately 50% of meningiomas & more common with large lesions. Malignant meningiomas are rare and difficult to differentiate from other malignant intracranial tumors; which may show brain invasion with deep expansile penetration of perivascular spaces with or without pial disruption. On post contrast MRI & CT scan studies, Meningiomas mostly show intense homogeneous enhancement within, excluding the areas of calcifications & necrosis.

CONCLUSION

Meningiomas are common intracranial benign tumors in day to day clinical practice. Meningiomas tend to present with signs & symptoms of raised intracranial pressure or seizure due to mainly its pressure effects. Meningiomas show some specific characteristic imaging features, which includes preponderance in female subjects, higher incidence at extra axial parasagittal and parietal convexity locations, homogenous in appearance, intense post contrast enhancement and internal calcifications etc. CT Scan & MR imaging studies are highly sensitive & specific for detecting above mentioned tumor characteristics, So can do accurate diagnosis of the meningiomas. Thus this study has evaluated helpful radiological modalities to accurately diagnose the meningiomas & also highlighted their epidemiological profile, clinical features & radiological findings in detail.

REFERENCES

1. Hardman JM; Non-glial tumors of the nervous system. In Schochet SS Jr. editor; Neuropathology. Churchill Livingstone, New York, 1983: 119.
2. Kepes JJ; Meningiomas. Biology, pathology and differential diagnosis. Masson, New York, 1982:17.
3. Russell DS, Rubinstein LJ; Pathology of tumours of the nervous system. 5th edition, Williams & Wilkins, Baltimore, 1989: 455.
4. Spagnoli MV, Goldberg HI, Grossman RI, et al.; Intracranial meningiomas: high-field MR imaging. Radiology, 1986; 161: 369–375.
5. Yeakley JW, Kulkarni MV, McArdle CB, et al.; High-resolution MR imaging of juxtasellar meningiomas with CT and angiographic correlation. AJNR Am J Neuroradiol., 1988; 9: 279–285.
6. Young SC, Grossman RI, Goldberg HI, et al.; MR of vascular encasement in parasellar masses: comparison with angiography and CT. AJNR Am J Neuroradiol., 1988; 9: 35–38.