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Case Report

Intraventricular Meningioma with Bilateral Petrous Meningiomas Mimicking Neurofibromatosis (NF-2): A Case Report and Review of Literature

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BACKGROUND: Multiple meningiomas (MMs) are defined as the presence of at least two lesions that appear at different intracranial locations, without the association of neurofibromatosis 2 (NF-2). They constitute 1-9 % of meningioma patients with females seen more predominantly.

CASE PRESENTATION: We report an unusual case of giant intraventricular meningioma with bilateral petrous meningiomas in a young female patient which gave a radiological impression of NF-2. Pure tone audiometry (PTA) was done which ruled out any sensorineural hearing loss (SNHL), hence NF-2 was ruled out. The patient was successfully operated upon by parietal craniotomy using the interparietal sulcus approach, and complete excision of the intraventricular tumor was done. Postoperatively, the patient had no new deficits. The patient was then followed up with Gamma knife surgery for the bilateral petrous meningiomas and anterior falcine meningioma.

CONCLUSION: Multiple meningiomas need to be differentiated from neurofibromatosis-2, which may alter management and prognosis. Every meningioma must be operated on its merit, irrespective of whether it is part of multiple meningiomatosis or not.

KEYWORDS: Intraventricular meningioma, Multiple meningiomatosis, Neurofibromatosis 2.

INTRODUCTION

Cushing and Eisenhardt first coined the term meningioma in 1938. Multiple meningiomas are defined as two or more spatially located meningiomas without stigmata of neurofibromatosis.[1] The authors report a young female patient with giant intraventricular meningioma and bilateral petrous meningiomas which gave a radiological impression of neurofibromatosis.[2] On careful evaluation, NF-2 was ruled out.

CASE PRESENTATION

A 30 years old female presented with headache and blurring of vision for 2 months. On examination, the distant visual acuity was finger counting at 2 feet in the left eye, whereas the right eye was normal. There was no hearing deficit or any other cranial nerve paresis. The rest of the neurological and systemic examination was normal including the absence of neurocutaneous markers. The patient was evaluated with contrast-enhanced magnetic resonance imaging (CEMRI) brain which showed a large intraventricular meningioma in the left lateral ventricle with associated hydrocephalus. There were associated small bilateral petrous meningiomas along with anterior falcine meningioma **(Figs. 1, 2).** PTA was within normal limits. No other abnormalities were found on the pre-operative evaluation. The patient was operated upon by left parietal craniotomy. Trans-cortical trans-ventricular approach was chosen through the left interparietal sulcus. Simpson grade 1 excision was done after attacking the tumor medial attachment and blood supply **(Fig. 3).** No postoperative complications or new neurological deficits were encountered. The patient reported improvement in the left eye vision to finger counting at 6 feet. Histopathology report was grade 1 fibrous meningioma.

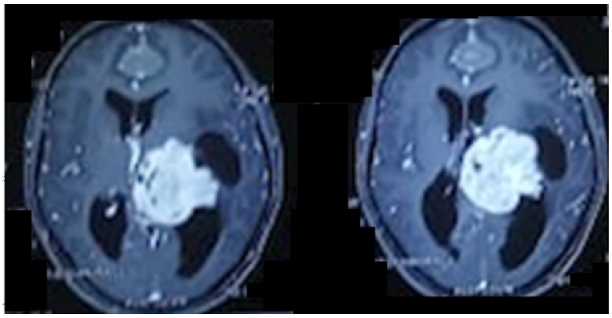

Fig 1: Axial CEMRI brain showing a large intraventricular meningioma in the left lateral ventricle with associated hydrocephalus and an anterior falcine meningioma.

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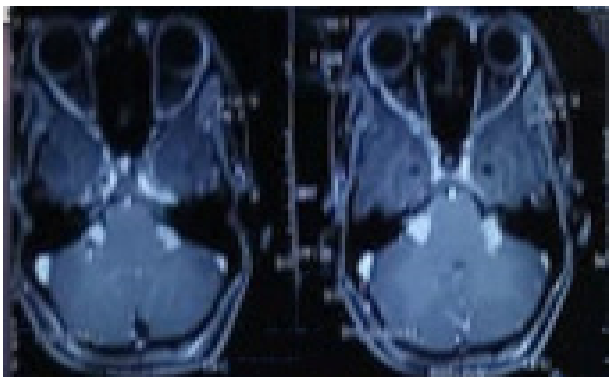

Fig 2: Axial CEMRI brain showing bilateral petrous meningiomas.

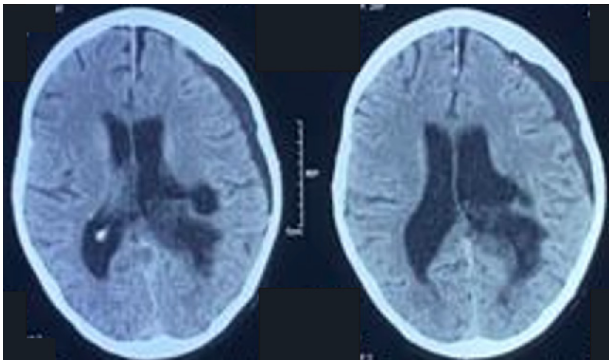

Fig 3: Postoperative axial contrast enhanced computerized tomography (CT) scan showing complete excision of intraventricular meningioma.

DISCUSSION

Meningiomas arise from arachnoidal granulations, stroma of the perivascular spaces and the choroid plexus.[2] Multiple meningiomas are defined as two or more meningiomas at different locations without clinical features of NF.[2-4] Various case reports have vividly described the presence of multiple meningiomas.[5,6] We report a case of multiple menigiomatosis which presented with symmetrical bilateral petrous meningiomas masquerading as bilateral acoustic schwanommas of neurofibromatosis.[2]

Sporadic multiple meningiomas are due to genetic aberrations of chromosome 22 and the action of progesterone on progesterone receptors.[7,8] Varied histological types reported in multiple meningiomas include psammomatous, fibroblastic, meningothelial, and transitional variants.[9,10] In our case report, the histological type was a fibroblastic meningioma. They also occur with radiation therapy and with NF-2.

The treatment and prognosis of MMs is the same as that of solitary benign tumors. Surgery is the treatment of choice for MMs and depends on the following factors; symptomatic meningioma, surgically accessible asymptomatic meningioma greater than 3 cm and symptomatic expanding tumor. Every tumor should be approached on a case by case basis, and just the presence of multiple tumors does not justify their removal.[11,12] Since it is well documented that multiple intracranial meningiomas are histologically benign, the prognosis is good and the same as for solitary meningiomas.[10] Nakamura et al. reported the annual growth rate from 0.73 to 1.67 cm^3 per year and the tumor doubling time from 1.19 to 6.81 years. Hence, asymptomatic meningiomas may be observed unless specific symptoms develop.[13] In the present case, the intraventricular meningioma was removed surgically and others were followed with Gamma knife surgery.

The unique feature of this case report lies in the fact that no case report in the review of literature has ever mentioned meningiomas to be exactly bilateral symmetrical and in the region of porous acousticus which gives the radiological impression of neurofibromatosis. On careful evaluation, there was no extension into the internal acoustic meatus and there was no sensorineural hearing loss on pure tone audiometry. Furthermore, the management of NF2 is completely different in the sense that before undergoing any modality of treatment, the patient has to be taught lip syncing first.

CONCLUSION

Multiple meningiomas need to be differentiated from NF, which may alter management and prognosis. Every meningioma must be operated on its merit irrespective of whether it is part of multiple meningiomatosis or not. This case will add to the growing body of literature in the management of MMs and aid practicing neurosurgeons in managing these “once in a lifetime” cases.

List of abbreviations

CEMRI: Contrast enhanced magnetic resonance imaging.
CT: Computerized tomography.
MMs: Multiple meningiomas.
NF: Neurofibromatosis.
PTA: Pure tone audiometry.
SNHL: Sensorineural hearing loss.

Disclosure

The authors report no conflict of interest in the materials or methods used in this study or the findings specified in this paper.

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REFERENCES

1. Cushing H, Eisenhardt L, Meningiomas: Their classification, regional behaviour, life history and surgical end result. Charles C Thomas; 1938.

2. Russel DS, Rubinstein LJ. Pathology of Tumors of the Nervous System. 4th ed. Williams and Wilkins; 1977.

3. Turgut M, Palaoglus S,Ösmam OE, Gurçay G. Multiples meningiomas of the central nervous system without the stigmata of neurofibromatosis: Clinical and therapeutic study. *Neurosurg Rev.* 1997;20(2):117-123.

4. Locatelli D, Bottoni A, Uggetti C, Gozzoli L. Multiple meningiomas evaluated by computed tomography. *Neurochirurgia.* 1987;30(1):8-10.

5. Domenicucci M, Santoro A, D'Osvaldo DH, et al. Multiple intracranial Meningiomas. *J Neurosurg.* 1989;70(1):41-44.

6. Gelabert-Gonzalez M, Leira-Muino R, Fernandez-Villa J M, et al. Multiple intracranial meningiomas. *Rev Neurol.* 2003;37(8):717–722.

7. Black P, Morokoff A, Zauberman J, Claus E, Carroll R. Meningiomas: Science and surgery. *Clin Neurosurg.* 2007;54:91–99.

8. Gruber T, Dare AO, Balos LL, Lele S, Fenstermaker RA. Multiple meningiomas arising during long-term therapy with the progesterone agonist megestrol acetate: Case report. *J Neurosurg.* 2004;100(2):328-331.

9. Kim TS, Park JK, Jung S, et al. Multiple intracranial meningiomas. *J Korean Neurosurg Soc.* 1997;26(12):1685-1691.

10. Eljamel MSM, Foy PM. Multiple meningiomas and their relation to neurofibromatosis. *Surg Neurol.* 1989;32(2):131-136.

11. Salvati M, Caroli E, Ferrante L, et al. Spontaneous multiple meningiomas. *Cent Eur Neurosurg.* 2004;65(4):180-184.

12. Sheehy JP, Crockard HA. Multiple meningiomas: A long term review, *J Neurosurg.* 1983;59(1):1-5.

13. Nakamura M, Roser F, Michel J, Jacobs C, Samii M. The natural history of incidental meningiomas, *Neurosurgery.* 2003;53(1):62-71.