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Original Research Paper

Neurosurgery

A PROSPECTIVE STUDY OF CRANIAL MENINGIOMA

Dr.Aditya shrivastava Assistant professor ,dept. of neurosurgery G.R.Medical College Gwalior M.P.

Dr .Neeraj Khera* Mch Resident, Dept. Of Neurosurgery G.R.Medical College Gwalior M.P. *Corresponding Author

ABSTRACT

AIM & OBJECTIVE: To evaluate epidemiology ,surgical options , outcome and recurrence rate of the meningioma.

MATERIAL & METHOD: In this study Consecutive patients seen at Department of Neurosurgery, J.A. Group of Hospitas, Gajra Raja medical college, Gwalior, M.P. Over a period of 24 months of period. We take the 50 patients whom clinical and CT/MRI finding showed of meningiomas has been including in this study, patients prepered for surgery and all the patients those were operated, post oparative CT/MRI scan done and follow up the patients .

RESULT& CONCLUSION: In this study we find that the mean age of diagnosis of meningioma was 47 years and predominantly find among females, with supratentorial convexity meningioma being the most common site. Most of the patients were having complete surgical excision. Histopathological grade of excised tumor were WHO grade I out of which meninigothelial was the most common type.

KEYWORDS : meningioma, supratentorial tumor

INTRODUCTION-

Meningiomas are tumours that develop from meningothelial cells of the arachnoid layer. (1, 2). Meningioma was first described in 1614 by Felix Paster (1, 3), and one hundred and sixty years afterwards, Louis (1, 4) published a series on the pathology of a "fungating tumour of the dura mater". The 18th century witnessed attempts at surgical resection and in 1887, W.W. Keen performed the first successful excision of a meningioma in the United States (1, 5, 6).

Later in the 20th century Harvey Cushing (1, 5, 7, 8) adopted the term meningioma as a single description for the different pathological types of tumours which arise from the meninges. The difficulties are admittedly great, sometimes insurmountable, and though the disappointments still are many, another generation of neurological surgeons will unquestionably see them largely overcome"(1, 7, 8).

MATERIAL AND METHODS:

In this study Consecutive patients seen at Department of Neurosurgery, J.A. Group of Hospitas, Gajra Raja medical college, Gwalior, M.P. Over a period of 24 months of period. We take the 50 patients whom clinical and CT/MRI finding showed of meningiomas has been including in this study, patients prepered for surgery(surgical excision were done according to simpson grade excision) and all the patients those were operated, post oparative CT/MRI scan done and follow up the patients .

Inclusion Criteria

Criteria for inclusion in the study were as follows:

a) Patients with clinically and radiologically suspicious intracranial Meningiomas.
b) Patients with biopsies of intracranial tumours positive for meningioma.

Exclusion Criteria

a) Patients with intracranial tumours whose clinical and radiological features were not suspicious for Meningioma.
b) Spinal and extra calvarial meningiomas were not included in this study.

Follow up

Patients follow up after discharge from neurosurgary department of the study were called for follow up in Neurosurgery OPD at the interval of 15 days initially, and after that advise to patient to follow up in Neurosurgery OPD one month of interval.

OBSERVATION-

Table no. 1 Tumor location

in our study supratentorial convexity meningioma being the most common (60%) site.

	LOCATION	NO. OF PATIENT	PERCENTAGE %
SUPRA-TENTORIAL	Convexity	30	60
	Falx and parasagital	03	06
	Sphenoid ridge-	03	06
	(a) Medial	00	00
	(b) Middle	00	00
	(c) Lateral	00	00
	Olfactory groov	03	06
	Tubercullum sellae	02	04
	Intraventracular	00	00
	Middel Fossa	00	00
	Orbital	00	00
	Intrasylvian	00	00
INFRA-TENTORIAL	Cerebellar convexity	05	10
	Tentorial	03	06
	Cp angle	01	02

Table No. 2 : Age wise distribution of patients

S.No.	Age (yrs)	No. of patients	Percentage %
1.	0-10	0	0
2.	11-20	0	0
3.	21-30	4	8
4.	31-40	9	18
5.	41-50	26	52
6.	51-60	8	16
7.	61-70	1	2
8.	> 70	2	4
	Total	**50**	**100**

Table no. 2 revealed meningioma were most common in 41 - 50 years followed by 31 -40 years of age

Mean age of meningioma : 47

Table No. 3 : Gender wise distribution of patients

S.No.	Gender	No. of patients	Percentage(%)
1.	Male	18	36
2.	Female	32	64

Table no. 3 revealed meningioma was common in Female than Male, Female : Male (1.7:1)

Table No. 4 : Presenting complaints

S.No	Clinical presentation	No. of patients	Percentage(%)
1.	Headache	48	96
2.	Seizure	25	50
3.	Clinical features of raised ICP	20	40
4.	Hemiparesis	08	16
5.	Behaviour problem	15	30
6.	Visual problem	8	16
7.	Altered sensorium	9	18

Table no.4 revealed, most common presenting complaints was headache 48(96%) of patients. followed by seizure (50%) of patients, other less common clinical feature suggestive of raised ICP(irregular respiration, bradycardia, and hypertension) (40%), ptosis (2%), hemiparesis (20%), behaviour problem (30%), memory difficulties (20%), visual problem found (16%) and altered sensorium (18%).

Table No 5 -Glasgow coma score (GCS)

	No. of patients	Post op. at the time of dischare	Followup (2 years)
Normal (15/15)	43	35	48
Mild (8-14)	7	15	1
Moderate (9-13)	0	0	0
Severe (5-8)	0	0	0
Critical severe (3-4)	0	0	0

Table No. 5 revealed, Out of 50 patients, 43(86%) were in full GCS, at the time of admission. 7 patients were admitted with altered sensorium. None of the patients GCS was less than 8.

Table No. 6 Glasgow outcome score

Glasgow outcome score	Glasgow coma scale at time of discharge		Follow up (24 month of period)
	Mild/ Moderate (9-15)	Severe(5-8)	
Good (Gd V)	18	00	49
Moderate disability(Gd IV)	20	00	00
Servere disability(Gd III)	12	00	00
Persistent vegetative state(Gd II)	00	00	00
Death(Gd I)	00	00	01

Table no 6 revealsd Glasgow out come score 5 of 18 patients, score 4 of 20 patients and scroe 3 of 12 patients. Follow up of 49 patients were score 5.

Table No: 7 -Size of the tumour

S.No.	Size of the tumour	No. of patients	Percentage (%)
1.	1-2 cm	0	0
2.	2-3 cm	0	0
3.	3-4 cm	7	14
4.	4-5 cm	13	26
5.	> 5 cm	30	60
	Total	50	100

Table no. 7, The size of the tumours ranged from between 1-2cm in diameter to more than 5cm in diameter with the largest tumour sizes of >5cm in their longest dimension accounting for 60% of all the tumours.

Table No. 8 : Types of flap, Surgical incision and craniotomy/ craniectomy

	Tumor location		Incision	Flap	Craniotomy/ craniectomy
Cerebral convexity meningioma (30)	Frontal	15	Curvi-linear	Frontal	Frontal
	Fronto –parietal	01	Curvi-linear	Fronto –parietal	Fronto –parietal
	Temporal	06	Linear	Temporal	Temporal
	Temporoparietal	02	Linear	Temporoparietal	Temporoparietal
	Parietal	03	Linear	Parietal	Parietal
	Parietal-occipital	03	Curvi-linear	Parietal-occipital	Parietal-occipital
Falx/ parasagital (3)	Anterior Middle		'U' shape	Frontal	Frontal
Sphenoid (3)	Lateral Middle Medial		Curvi-linear	Fronto-temporal	Fronto-temporal(perional)
Olfactory(3)			Bi coronal	Bi-frontal	Subfrontal
Tuberculum sellae(2)			Curvi-Linear	Sub frontal	Sub frontal craniotomy
Cp angle(1) Tentorial (3) Cerebellar convexity (5)			Linear	Sub occipital	craniectomy

Table No.9 : Distribution of patients according to surgical excision

S.No.	Simpson grade	No. of patients	Percentage %
1.	I	14	28
2.	II	30	60
3.	III	0	0
4.	IV	5	10
5.	V	1	2

In our study most common simpson grade Surgical excision of tumor was grade II excision which was (60%), second most common was grade I excision which was (28%).Other (10%) was grade IV excision and (2%) was grade V excision.

In our study we achieve gross total excision (grade I and II) was 88%, partial excision was 10% and simple decompression and biopsy was 2%.

Table No 10 : Distribution of patients according to histopathology

S.No.	Histopathology of Classification		No. of patients	Percentage %
1.	Grade I	Meningothelial	37	64
		Fibrous	5	10
		Transitional	4	8
		Psammomotous	0	0
		Angiomatous	3	6
		Microcystic	0	0
		Secretory	0	0
		Lymphoplasmocytic rich	0	0
		Metaplastic	0	0
2.	Grade II	Choroid	0	0
		Clear cell	0	0
		Atypical	0	0
3.	Grade III	Capillary	0	0
		Rhabdoid	0	0
		Anaplastic	1	2

Histopathology grading was done as per WHO classification of CNS tumor. It revealed that most common subtype was meningothelial 64% and second most common sub type was fibrous 10%.

Table No. 11 - Distribution of patients according to histopathology (WHO grade)

S.No.	Grade	No. of patients	Percentage(%)
1.	I	49	98
2.	II	0	0
3.	III	1	2

WHO grade III Meningioma was seen in 1 patient. It was anaplastic which was 2%. In our study we found 98% of tumor was grade I and 2% was grade III.

Table No. 12 : Post op complications

S.No.	Post op complications	No. of patients	Follow up patients
1.	Infection	2	0
2.	Seizure	15	5
3.	Hemiparasis	12	6
4.	Visual loss	5	4
5.	Behavior change	10	2
6.	Memory deficit	10	0
7.	Clinical features of raised (ICP)	10	0

Table No. 13 : Patient follow up data given as frequency

S.No.	Follow up	No. of patients	Recurrence
1.	< 1 year	49	1
2.	1-2 years	36	2

During 2 years follow up, In <1 years 50 patients were followed out of which recurrence is found in 1 pt. in CT Scan. Pt. was operated with Simpson's Gd II surgical excision, but couldn't survive due to medical illness

During 2 years follow up of 36 pt. turn out in OPD, out of them 2 were having recurrence in there operative site confirmed by CT Scan. These 2 pts. were having small lesion which was asymptomatic so decided to continue conservative management and follow up.

DISCUSSION

There are few prospective studies on histologically proven intracranial meningiomas in the literature. This study therefore serves as a useful baseline study on intracranial meningiomas in our environment.

Age &sex Distribution

The incidence of meningiomas increases with age (9). In this study, the youngest patient was 25 years old; the mean age was 47 years. Sex distribution in our study, female to male ratio is 1.7:1, Our study in accordance with the findings of Jaggon and Char (10) , Fynn et al (11) , Odebode et al (12) & Quiñones-Hinojosa et al (13) and Gasparetto et al (14)

Clinical Presentation

in our study most common clinical presentation is headache (96%),other is seizures (50%), clinical feature of raised ICP (40%) and behavior changes (30%), hemiparesis(16%) and visual impairment (14%).

Our study in accordance with Odebode et al (12) .

Location of Tumor

Supratentorially located meningiomas constitute 85-90% with 5-10% infratentorially located (14,).

Our study in accordance with Jaggon and Char (10) (87% and 4% respectively), Odebode et al (12) (94.3% and 5.7% respectively), and Quiñones-Hinojosa et al (13) (87% and 13% respectively).

Histopathology

The most commonly used grading system for meningiomas is that of the World Health Organization (WHO). The WHO classifies meningiomas into 3 grades: benign (WHO grade I), atypical (WHO grade II), and anaplastic or malignant (WHO grade III) and these constitute about 88-94%, 5-7% and 1-3% of cases respectively (15, 16,17, 18). Therefore most meningiomas are benign tumours with the potential for cure after complete surgical excision.

In our study WHO grade I constituted 98% of cases , grade II (00%) and WHO III (2%) .

Our study in accordance with Quiñones-Hinojosa et al (19), Jaggon and Char (20) and Das et al(21).

Recurrence

Recurrence rate of our study is 6% which was less than other studies

Comparing the recurrence rate between various studies.	Total recurrence rate
Ayerbe *et al. (22)*	21%
Jaaskelainen (23)	15.4%
Papanikolaou Hospital series (24)	21.5%
Our study	**06%**

CONCLUSION

In our study most of the meningioma are supratentorial with female predominance. In 4th decade. Most of the tumors were benign with simsons grade II and grade I excision was possible. Most of the cases having good recovery with minimal recurrence and mortality.

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