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Original Research Paper

Pathology

CLINICO-PATHOLOGICAL STUDY OF SUPRATENTORIAL MENINGIOMA: A TERTIARY CENTER EXPERIENCE

Dr Arti Sharma	MD Pathology Gajra Raja Medical College, Gwalior, Madhya Pradesh
Dr Avdhesh Shukla*	Associate professor Department of Neurosurgery Gajra Raja Medical College *Corresponding Author
Dr Anand Sharma	Assistant Professor Department Of Neurosurgery Gajra Raja Medical College, Gwalior
Dr S N Iyengar	Head of Department Department of Neurosurgery Gajra Raja Medical College

ABSTRACT Meningiomas are the tumours that develop from meningothelial cells of the arachnoid layer. These tumours are usually benign in nature, however, a small percentage is cancerous. Many meningiomas produce no symptoms throughout a person's life, and if discovered, require no treatment other than periodic observation. Typically, symptomatic meningioma is treated with either conventional surgery or radiosurgery.

We retrospectively review the data of 215 cases from our department with review of literature.

KEYWORDS : Supratentorial meningioma

INTRODUCTION

Meningiomas are the tumours that develop from meningothelial cells of the arachnoid layer. Meningioma was first described in 1614 by felix Paster and Louis first published a series on the pathology of a `` fungating tumour of the dura mater``. Later in 20th century Harvey Cushing adopted the term meningioma as a single description for the different pathological types of tumours, which arise, from meninges.

These tumours are usually benign in nature, however, a small percentage is cancerous. Many meningiomas produce no symptoms throughout a person's life, and if discovered, require no treatment other than periodic observation. Typically, symptomatic meningioma is treated with either conventional surgery or radiosurgery.

Meningioma are visualized readily with contrast CT , MRI with gadolinium and arteriography, all attributed to the fact that meningiomas are extra-axial and vascularized. Advances in neuroimaging have made the preoperative diagnosis of meningioma almost certain.

We review the available data in neurosurgery department with review of histopathology report to analyze clinical profile, management and prognosis.

MATERIAL AND METHOD:

The present study was retrospective study, based on data retrospectively collected from department of neurosurgery, GR Medical College and group of hospitals (GRMC) from 2010 to 2018. All histopathological confirmed cases were studied. Cases with spinal and extracalvarial meningioma were excluded from study. Preoperative assessment of consciousness level was done according to Glasgow coma score, along with higher mental function, neurological deficit and pupillary asymmetry. Patient with CT/ MRI finding consistant with meningioma were included in this study. On plain CT scan meningiomas appear isodense to slightly hyper dense compared contiguous brain parenchyma.

Calcification may be seen, on contrast enhanced CT meningioma usually enhance homogeneously. MRI brain is method of choice, meningioma appear rounded elongated extra axial masses, attach with dura 2 to 10 % of meningioma are cystic and present diagnostic challenge. All patients consistant with meningioma underwent surgical excision of mass. Level of excision was grade according to Simpson grade excision. Postoperative neurological assessment was done and diagnosis confirmed on histopathology.

RESULT

The study was conducted on 215 patients. There were 78(36%) male and 137(64%) females. Most common age group was between 41-50 years followed by 31-40 years. Mean age was 47. Most common location was convexity followed by parasagittal and falx meningioma (Table 1).

Table 1: Location wise distribution of supratentorial meningioma

Location	Number	Percentage
Convexity	133	62
Parasagittal/ Falx	43	20
Sphenoid wing	15	7
Olfactory groove	13	6
Tubercullum sellae	9	4
Intraventricular	2	1

Study revealed most common presenting complaints was headache in 208(96%) cases; followed by seizure (50%), clinical feature of raised intracranial pressure, hemiparesis (20%) and behavioral abnormality (30%), ptosis (2%). (Table 2)

Table 2: Presenting complaints in supratentorial meningioma cases

Clinical Presentation	Number	Percentage
Headache	208	96
Seizure	108	50
Raised ICP	86	40
Hemiparesis	34	16
Behavioral problems	64	30
Visual dysfunction	34	16
Altered sensorium	38	18

All patient underwent surgical excision of cases; histopathology grading was done as per WHO classification of CNS tumour. It revealed that most common subtype was meningothelial 64 %and second most common subtype was fibrous 10% (table 3).

Table 3: Histopathological distribution of supratentorial meningioma

Histopathology	Number	Percentage
Meningothelial	135	64
Fibrous	21	10
Transitional	17	8
Psammomotous	13	7
Angiomatous	12	6

Microcystic	0	0
Secretory	0	0
Lymphoplasmocytic	0	0
Metaplastic	0	0
Choroid	7	4
Clear cell	4	2
Atypical	2	1
Capillary	2	2
Rhabdoid	2	1
Anaplatic	0	0
Total	215	100

Study revealed most common postoperative complication was seizure, which was present in 15 % case followed by new onset hemiparesis, wound infection.

DISCUSSION

Meningiomas account for 25 - 30% of all CNS tumours and are the most common tumours arising from the meninges.[1,2,3]Most benign meningiomas occur in adult women, but atypical and anaplastic forms seem to be more common in men and the younger age group. Childhood meningiomas are less common [4,5]. Most meningiomas are intracranial. 90% are supratentorial; the anterior cranial fossa is involved far more frequently than the posterior.

The incidence of meningioma increases with age. In this study, the youngest patient was 25 year old; the mean age was 47 years. This corresponds with the finding of Jaggon and char [6] in Jamaica where the mean age of patients with intracranial meningiomas was 45 years. Sex distribution in our study, female to male ratio is 1.7:1, which is comparable to other studies[7].

The primary complaints of patients include focal deficit, seizures, psycho-organic syndrome, and headache[8]. The most common symptoms and signs reported in the literature are headache (36%), paresis (22%) and change in mental status (21%)[9]. This contrasts with the finding in our study, which showed headache (96%), seizures (50%), and clinical pictures of raised ICP more common. Supratentorial meningioma constitutes 85-90% of all meningioma cases. The most common locations include the convexity/ parasagittal (45%), sphenoid ridge (15-20%) and olfactory groove/ planum spheroidal (10%). But in our study convexity meningioma was 70 %, Falx and parasagittal 6%, olfactory groove 6 % and tubercullum sellae 4%.

The most commonly used grading system for meningiomas is that of the world health organisation (WHO). The WHO classifies meningiomas in to three grades: benign (Who grade 1), 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. There fore most meningiomas are benign tumours with the potential for cure after complete surgical excision. There is a range of subtypes based on their histological chractersteristics. However, the clinical behavior and outcomes correlate with the WHO grade, rather then the histological subtype. The grading of meningiomas is controversial, and accordingly there is a high incidence of inter-observer variability. In our study WHO grade I constituted 98% of cases, grades II (00%) and WHO III (2%) and contrasts with the rates reported in the literature. While this may reflect with the influence of inter-observer variability[10] in the grading of meningiomas. This may also indicate a need for a genome wide study of meningiomas in our environment likely to reveal valuable information at a high genomic resolution. In particular, it would be of value to assess copy number aberrations associated with the respective histological subtypes (typical, atypical, anaplastic) and with differing grade of tumours, in comparison to other published data[11]. The findings in this study compares to that of jaggon and Char[6] in Jamaica found 94% of tumours to be WHO grade I lesions and 6% of WHO grade III lesions in their study. Quinones-Hinojosa et[12] at in the Unites states showed 73% of tumours being WHO grade I, 19% WHO grade II and 7% WHO grade III. However, the restriction of their study to larger sized tumours (>5cm) may have influenced their findings. The findings of Das et al[10] in Singapore (WHO grade I. 90.2%, grade II, 6.8% and grade III, 3% respectively) were in agreement with rates in the literature. While their findings may be interesting and reflect the role of genetic and environmental factors in tumor epidemiology across differing world regions, the difficulties in characterization of various histological subtypes and lack of consensus in diagnostic criteria may also play a role in their findinges[10]. Histological subtypes constituting WHO II include atypical, clear cell and chordoid subtypes and for WHO III they include the rhabdoid, anaplastic and papillary subtypes. WHO grade I meningiomas may have a variety of appearances, with the meningothelial, fibroblastic, and transitional variants occurring most commonly. This is similar to the findings in our study.

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