REVIEW ARTICLE

Clinical Profile and Outcome of Intracranial Meningioma in Apollo Hospitals Dhaka

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Abstract

Background: A meningioma is a tumor that arises from the meninges- the membranes that surround the brain and spinal cord. **Objective:** This is a retrospective analysis of the recorded data of patients managed for intracranial meningiomas between January 2007 and June 2015 at Apollo Hospital, Dhaka. **Methodology:** Demographic data was analyzed for all but only patients who had surgery and histological diagnosis were analyzed for outcome. **Results:** This study shows that meningiomas had female preponderance. Majority cases were above 50 years of age. Convexity is the most common anatomical location of meningioma. Most common symptoms were headache (70%) followed by seizure in 34.3% of patients. 90% of the cases were benign. Malignant meningioma was 1.4% and recurrence was found in 1.4% of cases. Six patients with histological grades I, II and III meningiomas were sent for stereotactic radiotherapy after incomplete tumor resection or for residual tumour. Total removal was done in 80% cases and the mortality was 1.4%, in patient who had poor GCS score on admission.

Keywords

Meningioma, Anaplastic

Introduction

Meningioma, the term coined by Harvey Cushing, refers to a set of tumors that arise from arachnoidal cap cells.1 Meningiomas are the most common primary brain tumors in adults with presentations ranging from incidentally identified slow growing lesions to highly aggressive tumors. Meningiomas may occur intracranially or within the spinal canal.[2] Intracranial meningiomas are commonly found at the surface of the brain, either over the convexity or at the skull base. In rare cases, meningiomas occur in an intraventricular or intraosseous location. Meningiomas are visualized readily with contrast CT, MRI with gadolinium.[3] and arteriography, all attributed to the fact that meningiomas are extra-axial and vascularized.

Although the majority of meningiomas are benign, they may have malignant presentations. Classification of meningiomas are based upon the WHO classification system.[4] Benign Grade 1-90% (meningothelial, fibrous, transitional, psammomatous, angioblastic). Atypical Grade II-7% (chordoid, clear cell, atypical). Anaplastic/malignant Grade III-2% (papillary, rhabdoid, anaplastic).

The causes of meningiomas are not well understood.[5] Most cases are sporadic, appearing randomly while some are familial. Persons who have undergone radiation are more at risk for developing meningiomas, as are those who have suffered brain injury at some time.[6]

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Patients with neurofibromatosis type 2 (NF-2) have a 50% chance of developing one or more meningiomas. Many individuals have meningiomas, but remain asymptomatic, so the meningiomas are discovered during an autopsy. One to two percent of all autopsies reveal meningiomas that were unknown to the individuals during their lifetime, since they were never symptomatic.

Meningiomas are more likely to appear in women than men, may appear at any age, but most commonly are noticed in men and women age 50 or older. The location of the tumor is the most important factor in determining the outcome. Due to their location, convexity, parasagittal and lateral sphenoid wing meningiomas usually can be completely removed and their lifetime, since they were never symptomatic.

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Materials and Methods

This is a retrospective analysis of the recorded data of seventy patients treated for intracranial meningioma between January 2007 and June 2015 at Apollo Hospital, Dhaka. The majority of the patients were operated by the senior consultant. The classification in terms of location was based on pre-operative CT and MRI studies. Demographic data was analyzed for all, but only patients who had surgery and histological diagnosis were analyzed for outcome. Follow up was over an average period of 6 months with post operative image.

Results

Table I: Demographic characteristics (n=70)

Characteristics		
Age in years	**Frequency**	**Percentage (%)**
18-20	1	1.4
21-30	1	1.4
31-40	6	8.6
41-50	27	38.6
51-60	20	28.6
61-70	13	18.6
>70	2	2.8
Total	70	100.0
Mean ±SD	51.61±11.03	
Sex		
Male	20	28.6
Female	50	71.4
Total	70	100.0
Ratio	F:M = 2.5:1	

Table II: Co morbidity (n=70)

Co-morbidity	Frequency	Percentage (%)
None	29	41.4
DM	25	35.7
HTN	29	41.4
Bronchial Asthma	3	4.3
Rheumatoid Arthritis	2	2.9
Coronary disease	3	4.3
CKD	1	1.4

N.B: Total will not correspond to100% because of multiple co-morbidity were present in some patients

Table III: Symptoms (n=70)

Symptom	Frequency	Percentage (%)
Headache	49	70.0
Seizure	24	34.3
Weakness	18	25.7
Visual Problem	11	15.8
Balance problem	8	11.4
Vertigo	7	10.0
Loss of consciousness	5	7.1
Speech Problem	4	5.7
Vomiting	3	4.3
Facial Pain/Trigeminal neuralgia	2	2.8
Hearing problem	1	1.4

N.B: Total will not correspond to100% because of multiple symptoms were present in some patients

Table IV: Location (n=70)

Location	Frequency	Percentage (%)
Convexity	27	38.6
Falcine +Parasagittal	13	18.6
Parasagittal	1	1.4
Sphenoid wing (lateral)	9	12.8
Tuberculam sella	4	5.7
Olfactory groove	6	8.6
Tentorial	2	2.9
CP angle	2	2.9
Orbital	2	2.9
Clinoidal meningioma	1	1.4
Temporal skull base	2	2.9
Temporal skull base involving cavernous sinus	1	1.4

Table V: Simpson grade of removal (n=70)

Simpson grade	Frequency	Percentage (%)
Grade I	42	60.0
Grade II	16	22.9
Grade III	12	17.1

Table VI: Histopathology (n=70)

Histopathology	Frequency	Percentage (%)
Grade I	63	90.0
Grade II	6	8.6
Grade III	1	1.4
Total	70	100.0

Table VII: Complication (n=70)

Complication	Frequency	Percentage (%)
Yes	7	10.0
Ischemic Stroke	2	2.9
Infection	2	2.9
Venous infract	1	1.4
Weakness	1	1.4
Subgaleal CSF Collection	1	1.4
Death	1	1.4
No	62	88.6

Table VIII: Outcome (n=70)

Outcome	Frequency	Percentage (%)
Total removal	56	80.0
Residual tumour	12	17.2
Recurrence of tumour	1	1.4
Death	1	1.4
Total	70	100.0

Discussion

This study shows meningiomas have a female preponderance. Odebode et al.[7] reported female predominance. Majority cases were above 50 years of age. Meningioma risk increases with age in both male and female.[8] A similar trend is seen from other reports from Africa and Asia.[9] Childhood cases of meningiomas are rare world-wide and this is confirmed in this series.[10]

Convexity is the most common anatomical location of meningioma in this series. This is similar with other studies in Africa where the most common location is convexity followed by parasagittal.[7,9] We did not have any case of intraventricular meningioma but had one case of multiple meningiomas. Presentation varied with anatomical location of tumor. Most common symptoms were headache (70%) followed by seizure which occurred in 34.3% of patients.

In this series 90% cases were benign. Similar studies reported meningiomas are monoclonal like other cancers and they are predominantly benign in behavior.[8] There is a preponderance of meningothelial in the histological pattern of our patients. These findings are consistent with the literature. Atypical meningioma is reported to be more common in Blacks than in Whites and Hispanics in the USA.[11] Only 8.6% showed this histological pattern in our series.

In this study malignant meningiomas was 1.4%. According to some studies, malignant meningiomas comprise between 4.7 and 7.2% whereas atypical meningiomas account for 1.0 to 2.8%.[12]

In this series, recurrence was found in 1.4% the low recurrence is likely due to short term follow-up. Though meningiomas are considered to be benign tumors, recurrence is observed with rates that vary between series.[13] The best accepted factor for prediction of recurrence is the 1957 Simpson grading system for completeness of resection,[14] which evaluated invasion of the venous sinuses, tumor nodules in adjacent dura, and infiltration of unresected bone by meningothelial cells as chief causes for recurrence. The recurrence rates that Simpson refers to were 9% for grade I resection, 16% for grade II, 29% for grade III, 39% for grade IV, and 100% for grade V, respectively.

In our study, six patients with histological grades I, II and III meningiomas were sent for stereotactic radiotherapy after incomplete tumor resection or for residual tumour. Another important issue to be cleared is whether meningiomas sometimes progress histopathologically to a higher grade and develop aggressiveness after they are operated. Some series have shown that up to 2% of all benign meningiomas transform into malignant form.[15] This is supported by other studies also.[16,17] The outcome of the surgery can be satisfactory in most of the cases with low mortality rate as shown in our study.

Conclusion

This study shows that the most common symptoms were headache, seizures and focal neurological deficit. The most common locations were convexity and parasagittal/falcine. Benign tumours were the commonest. Regular follow-up MRI or CT scans (once every one to three years) is an important part of long term care.

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