SURGICAL MANAGEMENT OF THE SPHENOID WING MENINGIOMAS

Azmatullah Khattak, Ali Haider
Department of Neurosurgery
Postgraduate Medical Institute, Lady Reading Hospital Peshawar

ABSTRACT

Objective: To find out the outcome of total removal of sphenoid wing meningioma.

Material and Methods: This study was conducted at the department of neurosurgery PGMI Lady Reading Hospital (LRH), Peshawar from 15th August, 2002 to 15th August, 2005. Only patients of sphenoid wing meningiomas were included in this study. Patients above 70 years who were not fit for general anaesthesia were excluded. All patients were operated through pterional approach. Follow up was done till discharge from hospital or death of the patient. Data was collected regarding preoperative and postoperative findings of the patients for final analysis.

Results: Total number of operated patients were 19 (12 males, 7 females). Ages ranged from 35 years to 67 years. Mean age was 50 years.

Signs and symptoms of raised intracranial pressure (ICP) were present in all cases, seizures in 15 (78.9%) patients, decreased vision in 11 (57.9%) patients. CT Scan brain was performed in all cases. In all 19 patients tumours were removed totally. Post-operatively signs and symptoms of raised ICP improved in all patients. Nine out of 15 patients (60%) were seizure free. Hemiparesis improved in 6 out of 9 (66.7%) cases. Complications included meningitis and dysphasia in 2 (10.5%) cases each; CSF leaks, and hemiplegia in one case each (5.3%). Mortality rate was 5.3% (1/19).

Conclusion: Early diagnosis and total removal of tumour improves the clinical status. Chronic headache, slow mentation and seizures needs attention and early computerized tomography scan of the brain with contrast.

Keywords: Sphenoid Ridge Meningiomas, Management, CT Scan, Seizures.

INTRODUCTION

Meningioma, arising from the cap-cells of arachnoid makes 20% of all primary intracranial neoplasms. In 1922 Harvey Cushing used the term of meningioma for these lesions for the first time. These tumours were named before that as “dural endothelioma” “arachnoid fibroblastoma and meningeal fibroblastoma.”

Majority of these tumours occur in patients at the age of 40-60 years and male-female ratio is 1:2 to 1:4. Meningiomas are slow growing tumours. The incidence of meningiomas in general population is from 2 to 15 per 100,000 population. Sphenoid wing meningiomas are 15-20% of all meningiomas. It usually present with fullness in the temporal fossa as well as proptosis.

Meningiomas are graded as benign in 92%, atypical in 6% and malignant in 4% cases. According to WHO classification 2000, meningiomas are classified into three groups.

- WHO Grade -1 (typical),
- Grade II (Atypical) and
- Grade III (anaplastic).

Meningiomas are classified according to locations also. The five-year recurrence rates have been calculated as 3% for benign meningiomas, 38% for atypical meningiomas and 78% for malignant meningiomas.

As there has been scanty data regarding sphenoid wing meningioma from Pakistan, this study was done to find out the outcome of total removal of sphenoid wing meningioma in our population, under locally available facilities.

MATERIAL AND METHODS

This study was conducted in the department of neurosurgery Postgraduate Medical Institute.
PRE-OPERATIVE AND POST-OPERATIVE CLINICAL FEATURES

<table>
<thead>
<tr>
<th>Clinical Findings</th>
<th>Pre-Operative n = 19</th>
<th>Post-Operative n = 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raised Intracranial Pressure (ICP)</td>
<td>19 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Seizures</td>
<td>15 (79%)</td>
<td>6 (31.6%)</td>
</tr>
<tr>
<td>Slow Mentation</td>
<td>12 (63%)</td>
<td>4 (21%)</td>
</tr>
<tr>
<td>Decreased Vision</td>
<td>11 (58%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Hemiparesis</td>
<td>9 (47%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>Nausea</td>
<td>5 (26%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Altered sensorium</td>
<td>5 (26%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Table 1

Institute, Lady Reading Hospital (LRH) Peshawar from 15th August 2002 to 15th August 2005. Patients were admitted throughout the patient department, through emergency department of LRH or shifted from other units of LRH. Only patients of sphenoid wing meningiomas were included in this study. Patients above 70 years who were not fit for general anaesthesia were excluded from the study as they were not subjected surgery.

In all patients routine investigations were performed after history and examination. In all patients CT scan brain were performed with and without contrast. Simple skull roentgenograms along with CT scan brain and MRI brain T1-weighted and T2-weighted images without contrast was done where required. Angiography was not done in any case.

In all patients pterional approach was used with question mark scalp incisions. Five bur holes were placed and osteo-plastic craniotomy flap were turned toward the base. Lower part of the temporal base along the zygomatic arch and sphenoid ridge were partially nibbled. Dura was opened anterior-inferiorly. Tumours were removed totally in classical way.

All patients were observed postoperatively for improvement in clinical status, intracranial pressure, hemiplegia or paresis, slow mentation, apathy and seizure frequency. Any complication occurred was noted. Patients were followed up during the hospital stay only and final outcome was noted at discharge from hospital or death of the patient. Data was collected for analysis.

RESULTS

Total number of sphenoid wing meningioma during the time period were 21. Two cases were excluded from the study as they were more than 70 years old and were clinically not fit for surgery. So number of operated patients with sphenoid wing meningioma were 19. Out of these 19 operated patients, 12 (63.2%) were female and 7 (36.8%) were male. Ages were from 35 years to 67 years. Mean age was 50 years. All patients had signs of raised intracranial pressure. In all patients, brain CT Scan had been performed and MRI in four cases (21%).

Preoperatively, sign and symptoms of raised intracranial pressure (headache, nausea, vomiting, blurring of vision) were present in all cases (100%); seizures were present in 15 (79%) patients, diminished vision in 11 (58%) patients (Table 1).

All patients were operated and tumours were removed totally. Chemotherapy and radiotherapy were not used in any case. Preoperative endovascular embolization of the vessel supplying the tumour was also not used.

Post-operatively signs and symptoms of raised intracranial pressure improved in all 19 (100%) patients. Nine out of 15 (60%) patients with seizures were seizure free postoperatively with mild to moderate doses of anti-epileptic

COMPLICATIONS

<table>
<thead>
<tr>
<th>Complications</th>
<th>Frequency n = 19</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningitis</td>
<td>2</td>
<td>11%</td>
</tr>
<tr>
<td>Dysphasia</td>
<td>2</td>
<td>11%</td>
</tr>
<tr>
<td>CSF leaks</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>Hemiplegia</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>Death</td>
<td>1</td>
<td>5.3%</td>
</tr>
<tr>
<td>Total:</td>
<td>6</td>
<td>31.6%</td>
</tr>
</tbody>
</table>

Table 2
medication (not responding to mega doses of these drugs before surgery) and in rest of 6 patients (40%) frequency and severity of fits were decreased. Hemiparesis improved in 6 out of 9 cases (66.7%) and slow mentation in 8 out of 12 cases (66.7%) (Table 1).

Two (11%) patients developed post-operative meningitis, two patients (11%) had speech disturbances, one (5.3%) patient had CSF leak. One (5.3%) patient developed hemiplegia after surgery. One (5.3%) patient died after surgery due to severe chest infection (Table 2).

DISCUSSION

Meningiomas are 20% of all intracranial neoplasms and most commonly occur in females. The ratio of female to male is 2:1 to 4:1 in literature and in our study it is about 2:1. These tumours are mainly diagnosed in the patients at the age of 40-60 years.

Plain X-rays skull may show hyperostosis and sclerosis in vault and skull base. Sometimes there is thinning and erosion of the inner table, which is an indication of pressure effects of the tumour.

Computed tomography imaging provides information about size, consistency, bone involvement, presence of mass effect, extra-axial nature of meningiomas. Majority of meningiomas appear hyperdense on non-enhanced sequences and are uniformly contrast enhanced, sometime showing cystic areas and foci of calcification. There is peri-tumoural hypodensity or edema.

Magnetic Resonance Imaging (MRI) has become the most sensitive method of investigation for the detection and characterization of meningiomas. T1 Allows assessment of various channels patency and tumour encasement or occlusion of vessels.

In our study it was observed that more than 80% of patients were diagnosed very late. They used self medications and were treated conservatively by various practitioners for chronic headache, vague psychiatric symptoms, dimness of
vision and seizures. Some of the patients were brought in emergency to medical units in comatose condition and had hemiparesis or plegia and were treated as a case of meningitis or cerebral malaria. Similarly patients with seizures were treated with anti-epileptics for years. As the size of tumour was increasing the frequency and severity of fits were increasing. The physician were increasing the doses and were shifting the monotherapy regimen to multi drug regimen. The patients ultimately came to neurosurgical clinics when they developed hemiparesis and loss of sensorium.

Epilepsy is a common presentation in various intracranial tumours. These patients are usually treated by physicians and psychiatrists. There is a need of thorough physical and neurological assessment. Attention should be given to patients having partial seizures, or having localizing signs or having signs and symptoms of raised intracranial pressure. As CT Scan are available even in regional hospitals so the diagnosis of intracranial meningiomas should not be a dilemma for a physician. We have diagnosed all the cases with brain C.T. Scan with contrast and in some cases have done brain MRI for the better evaluation of tumour and relationship with brain structure. In some state of the art centre MR spectroscopy and angiography are performed to know about the biology and blood supply of the tumour and similarly involvement of the vascular structures. In some centre preoperative tumor embolization is obligatory to minimize the bleeding and decrease mortality and morbidity. We have not used this endovascular procedures in our patients.

As we do not have sophisticated method of neuronavigation (frameless stereotaxy) and state of the art neuroanaesthesia and neurointensive care and on the other hand poor general physical conditions and clinical (loss of sensorium and hemiplegia) and large size of the tumours, our mortality and morbidity is slightly more than developed neurosurgical centres.

Prognosis of intracranial meningioma depends upon the age and clinical status of patient, site of tumour, surgical procedure removing subtotal or total bulk of tumour and presence of malignancy. According to the world literature meningioma mortality is 2.3% and over all morbidity is 21%. In our study mortality was about 5.3% (one case) which is comparable to another local study having mortality rate of 2.9% (one case).

Our morbidity is in the range of 32%, which include meningitis, hemiparesis, CSF leak, speech disturbances and slow mention, apathy and seizures. Our surgical results are according to the literature.

CONCLUSION

Chronic headache, slow mention and seizures needs attention and early computerized tomography scan of the brain with contrast should be done on all suspicious cases. This will help in early diagnosis of the meningioma. Early diagnosis and early surgery with total removal of the tumour leads to better immediate outcome. Long term follow up studies are needed to study the long-term outcome of surgery.

REFERENCES

11. Osborn A. Diagnostic Neuroradiology St.

12. Nakano T, Asano K, Miura H. Meningiomas
with brain edema: radiological characteristics
on MRI and review of the literature. Clin

13. Kawaguchi T, Kameyama S, Tanaka R.
Peritumoral edema and seizures in patients
with cerebral convexity and parasagittal
meningiomas. Keural Med Chir (Tokyo) 1996;
36: 568-73.

Sequential MRI and MR spectroscopy in
embolized, meningiomas; correlation with
surgical and histopathological findings.
Neuroradiology 2002; 44: 77-82.

15. Lieu AS, Howng SL. Intracranial meningiomas
and epilepsy: Incidence, prognosis and
influencing factors. Epilepsy Res 2000; 38:
45-52.

16. Majos C, Alonso J. Aguitera C. Utility of
proton MR spectroscopy in the diagnosis of
radiologically atypical intracranial

17. Yamasaki F, Yoshioka H, Hama S. Recurrence

18. Sindou M, Alaywan M. Most intracranial
meningiomas are not cleavable tumour:
anatomic surgical evidence and angiographic

19. Ojemann RG. Management of cranial and
spinal meningiomas (hourned quest

20. Ilyas M. Intracranial meningiomas surgical
experience with 34 cases. Pak J Neurological