Anterior Clinoid line: A Predictor for Operative Outcome of Medial Sphenoid Wing Meningiomas

Arab A.\textsuperscript{1}, Hawasai A.\textsuperscript{1}, AlObaid A.\textsuperscript{2}
King Abdulaziz Medical City
King Fahad Medical City, Riyadh
Introduction

• Meningiomas are benign tumors that are the most frequently diagnosed primary brain tumors representing about 16-20% of intracranial tumors.

• Sphenoid wing meningioma accounts for approximately 20% of supratentorial lesions.

• Resection of this tumor is challenging and has a high mortality rate up to 32% and morbidity due to its proximity to vital structures including: the optic nerve, internal carotid artery and its branches, and cavernous sinus.
Objective

The purpose of this study is to establish an association between the maximum diameter of the medial sphenoid wing meningioma (MSWM) medial to the anterior cliondal line (AC line) and post-operative complications.
Methodology

• **Study Design:**
  • A retrospective cohort study

• **Sampling Technique:**
  • Convenience sampling of all surgically resected MSWM cases at the National Neurosciences Institute at King Fahad medical City, Riyadh, Saudi Arabia over the last 10 years, who had pre-operative MRI, and were followed up for at least three months.

• **Data Collection**
  • Demographics, pre-operative signs and symptoms, post-operative complications and radiological measurements were collected for all 35 cases that have fulfilled the inclusion criteria using available medical records and radiological imaging.
AC Line Measurement

We have measured the MSWM maximum medial margin and maximum lateral margin in relation to a line crossing the tip of the AC and parallel to a midline that extends between the most caudal edge of superior sagittal sinus and the most midline structure, such as vomer or rostrum of the sphenoid sinus.
These measurements were then correlated with patient demographics, preoperative symptoms and post-operative assessment to look for any significant correlations.
Methodology cont’d

• The measurement of the maximum medial diameter of the MSWM ranged from 0 to 35, therefore, the median (13mm) was used to divide the cases into two groups.

• Group A: Medial extension of MSWM is <13mm

• Group B: Medial extension of MSWM is ≤13mm
Results
Demographics

Out of 259 cases, 35 fulfilled the inclusion criteria

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
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<tr>
<td>Number of cases</td>
<td>35</td>
<td>100</td>
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<tr>
<td>Gender</td>
<td></td>
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<tr>
<td>Female, no</td>
<td>27</td>
<td>75%</td>
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<tr>
<td>Male, no</td>
<td>9</td>
<td>25%</td>
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<tr>
<td>Median age, years</td>
<td>51</td>
<td>(Q25=40.5-Q75=70.0)</td>
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<tr>
<td>Diabetes, no</td>
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<td>22%</td>
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<tr>
<td>Hypertension, no</td>
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<td>25%</td>
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</table>
Medial Extension of MSWM and Extent of Resection

Group A
- Total Resection: 60%
- Subtotal Resection: 40%

Group B
- Total Resection: 75%
- Subtotal Resection: 25%
Group B

- Pre-operative
- Post-operative Worsening
Results cont’d

• In Group A, 10% developed ICH postoperatively, however, none of the patients developed major complications including, CSF leak, hydrocephalus, pneumocephalus, meningitis, or death.

• In Group B, meningitis was observed in 13% of the patients and hydrocephalus in 7%.
Discussion

• This is the first description of AC line measurement and correlation with post operative complications.

• Goel et. Al. have created a grading system that depends on visual involvement, tumor size, and internal carotid involvement and correlates the total score with the extent of excision.

• Concluding that the extent of invasion has a direct effect on the extent of excision.
Conclusion

• The percentage of gross total resection is higher in cases of MSWM with medial extension less than 13mm, whereas the percentage of subtotal resection is higher in cases with medial extension more than 13mm.

• The current study suggests that worsening of preoperative neurological deficits can be correlated with increase in medial extension of MSWM.
References


Thank you