The Occipital Interhemispheric Approach to the Pineal Region: Review of Series
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Introduction
The pineal region is located posterior to the midbrain and anterior to the cerebellar vermis (Figure 1). Lesions in this area are widely variable. The occipital interhemispheric (OIH) approach is used in the resection of pineal region tumors and makes use of the paucity of bridging veins to the superior sagittal sinus at the occipital pole. In comparison to the supracerebellar-infratentorial (SI) approach, it provides a wider working corridor and enables access above the deep draining veins (Table 1).

Figure 1
The pineal region: From Poppen 1966

Methods
- Retrospective review of all cases of OIH approach performed by the senior author A.N., from 2000-2013
- 25 patients (Table 2)
- Report on the surgical outcome, complications and clinical outcome

Figure 2

Table 1
Comparisons between the SI and OIH approaches

<table>
<thead>
<tr>
<th>Description</th>
<th>SI</th>
<th>OIH</th>
</tr>
</thead>
</table>
| Indications | Smaller lesions | Larger lesions
|              | Medial lesions | Medial lesions with surgical extension
|              | Cranial displacement of deep veins | Cranial displacement of deep veins
| Advantages   | Medial, easy orientation | No orbital bridging veins
|              | Beneath deep venous structures | Gravity enabled extraction of occipital lobe (lateral position)
|              | No violation of parietal or occipital lobes | Early violation of deep veins
| Disadvantages| Narrow operative field | Large operative field
|              | May violate parietal cerebellar veins | May violate the superior cerebellar veins + cerebellar lesion
|              | May violate thalamus + cerebellar lesion | May violate thalamus + visual field defect

Table 2
Comparisons of 25 patients with pineal region lesions

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No of Patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13 (52)</td>
</tr>
<tr>
<td>Female</td>
<td>12 (48)</td>
</tr>
<tr>
<td>Age (y)</td>
<td>46.75 (range 15-82)</td>
</tr>
<tr>
<td>Presenting symptom</td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td>19 (76)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>5 (20)</td>
</tr>
<tr>
<td>Ataxia</td>
<td>4 (16)</td>
</tr>
<tr>
<td>Visual deficits</td>
<td>3 (12)</td>
</tr>
<tr>
<td>Memory and cognitive problems</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Weakness</td>
<td>1 (4)</td>
</tr>
</tbody>
</table>

Figure 3
A 21yr-old male with a teratoma resected via the OIH approach. Gross total resection was achieved.

Conclusions
- The OIH approach is safe and efficacious way to approach pineal region tumors.
- It provides a wider working corridor and access to lesions in the medial temporal lobes and the superior cerebellar vermis.
- Appropriate patient selection based on extensions of the lesion and deep venous displacement is still tantamount in selecting the suitable approach.

Results
- Average follow-up - 15.5 months
- GTR 80% (Figure 3)
- 2 patients with new but transient visual symptoms
- There were no post-operative infections, CSF leaks, hemorrhage or venous/arterial infarctions.
- No surgical deaths
- GOS of 4 or 5 in 80% of the patients

References

Learning Objectives
By the end of this section, participants should be able to
- Understand the anatomy of the pineal region
- Recognize the many indications for the occipital interhemispheric approach
- Provide an appropriate comparison with other approaches to this region