Objective sinonasal functional outcomes in anterior skull base surgery: An evidence based review with recommendations

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Abstract

Introduction

Endoscopic approaches to the skull base have dramatically expanded in recent years, with traction points on a single incision in the past. This approach has been beneficial. The introduction of an endoscopic approach to surgical treatment of sinonasal and cranial outcomes has been well established. The purpose of this study was to systematically review the literature evaluating objective sinonasal outcomes in anterior skull base surgery, and provide evidence-based recommendations.

Methods and Materials

In comparison to traditional approaches, endoscopic approaches to anterior skull base surgery: - Equivalent tumour resection rates and biochemical cure3,4,5 - Shorter operation times and hospital stay - Reduced complication rates - Improved quality of life6

The variability in surgical techniques limits our ability to make recommendations on the extent of resection of normal nasal structures, including olfactory epithelium. - Olfactory dysfunction has been shown to have significant quality of life impact7 - Patient-reported olfactory dysfunction rates range from 2% to 78%8

Objective sinonasal outcomes were identified as external mucosal changes and nasal airflow9. The study aims to systematically evaluate the quality of life impact, as well as the functional outcomes of sinonasal surgery, specifically the olfactory epithelium.

Results

Olfaction:

- 10 articles included
- 2 randomised control trials
- 6 cohort studies
- 2 retrospective case series

Nasal Airflow:

- 3 studies identified

Discussion

Use of monopolar cautery caused significant changes in histological epithelial loss surrounding incisions compared with cold incisions (Kim et al 2013). - Insufficient evidence in identified studies to make recommendations on the use of cautery vs cold incisions.

The variability in surgical techniques limits our ability to make recommendations on the extent of resection of normal nasal structures. - Ipsilateral middle turbinate resection with preservation of contralateral superior turbinate did not show olfactory impact (Sowerby et al 2013).

No recommendations able to be made on the impact of endoscopic anterior skull base surgery on mucosal function or nasal airflow due to lack of identified studies.

Both potential targets for future research.

Conclusions

References

7. Kim J, Litman A, Al-Mefty O, Haldar G. Objective olfactory function. Endoscopic sellar and parasellar surgery without the elevation of a NSF, may lead to a transient reduction in olfactory function. In the absence of a high risk of endoscopic skull base surgery, it is advisable to avoid routine NSF elevation in order to preserve olfactory function. The mechanisms of olfactory dysfunction may include the risks of overdistention of the olfactory mucosal flap. Due to limited evidence, no conclusions can be reached regarding the impact of endoscopic surgery on olfactory function or nasal airflow.

Methods

A structured literature search was carried out between December 10 and 12

Inclusion criteria: - Adult population (>18 years), anterior endoscopic surgical primary, or secondary objectives including objective measures of sinonasal outcomes

Exclusion criteria: - Combination of anterior and non-anterior approaches to tumors, studies reporting only subjective outcome measures (including visual analog scale scores), no full-text availability.

Included studies were critically evaluated for quality, bias and level of evidence based on published guidelines (Oxford Centre for Evidence-Based Medicine (CEBM)). An aggregate grade of evidence was produced, and recommendations made based on the American Academy of Paediatrics Guidelines.

Results

<table>
<thead>
<tr>
<th>Olfaction</th>
<th>Nasal Airflow</th>
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<tbody>
<tr>
<td>- 10 articles included</td>
<td>- 3 studies identified</td>
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<table>
<thead>
<tr>
<th>Cost</th>
<th>Benefit</th>
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<tr>
<td>Variable depending on extent of operative time, and number of extra visited for debridement</td>
<td>Reduction in post-operative recurrence of CSF leak</td>
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<thead>
<tr>
<th>Policy Level</th>
<th>Option</th>
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<tr>
<td>In patients not at a higher risk of intra-operative CSF leak, or issues with wound healing (eg. Post-radiation therapy), routine NSF elevation for sellar and parasellar skull base surgery can be avoided. The pedicle for this flap should be preserved on at least one side during the approach in this situation to allow for its future use.</td>
<td>Preponderance of benefit over harm</td>
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<p>| TABLE 1 – Summary of findings of eligible randomised control trials and cohort studies |
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<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>Comparator</th>
<th>Follow-up</th>
<th>Main Outcomes</th>
<th>Conclusions</th>
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<p>| TABLE 2 – Recommendations for nasoseptal flap use and surgical extent in endoscopic sellar and parasellar anterior skull base surgery |
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<table>
<thead>
<tr>
<th>Items</th>
<th>Aggregate Grade of Evidence</th>
<th>Explanation</th>
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Contact

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References

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