Management Strategies for Sinonasal Inverted Papilloma

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Abstract

Purpose: 1) To compare endoscopic and external approaches in the management of sinonasal inverted papilloma at our institution, 2) To discuss the relationship of these management strategies to disease stage and malignancy.

Materials & Methods: Retrospective chart review of 17 patients who had surgery for sinonasal inverted papilloma. Demographic, imaging and intraoperative data were collected from clinic charts. All patients had a definitive procedure performed between 2001 and 2007, with preoperative staging by CT, MRI or both. The primary outcome measure was recurrence. Secondary outcome measures included association with malignancy and intraoperative complications.

Results: CT and MRI scanning were utilized for staging in 68% and 53% of cases, respectively. Mean follow-up was 15.4 months. All T1 lesions were managed by functional endoscopic sinus surgery (FESS). 71% of T3 lesions were managed by transnasal endoscopic medial maxillectomy (TEMM). 33% and 67% of large T3 and T4 lesions were managed with external procedures and TEMM, respectively. Recurrence rates for T1, T3, and T4 lesions were 0%, 14.3%, and 100%, respectively. Recurrence by surgical method were 0%, 27% (2 T3 and 1 T4), and 0% for FESS, TEMM and external approaches, respectively.

Conclusions: Inverted papilloma tended to present at more advanced stage. T1 and T3 lesions were generally managed by FESS and TEMM, respectively. Large T3 and T4 lesions were generally managed via external approaches or required further definitive management via an external approach. MRI, especially with frontal disease, may augment CT scanning. Identifying true tumor mass, and thus provide indications for or against supplementary procedures.

Introduction

Inverted papilloma (IP) is an uncommon benign, but locally aggressive neoplasm that arises from mucosa in the region of the middle meatus and often extends into the paranasal sinuses. Although benign, inverted papilloma may be associated with atypia, dysplasia, carcinoma in situ or frank squamous cell carcinoma. An association with squamous cell carcinoma is seen in about 10% of cases and may represent very malignant long-term follow up, due to the increased risk of recurrent disease, believed to be caused in most cases by incomplete resection. Due to the tendency of IP to recur and the belief that most recurrences are due to inadequate resection, complete excision of the lesion is very important. Historically, lateral rhinotomy with medial maxillectomy has been the primary treatment of inverted papilloma, and none experienced a recurrence during the follow-up period. Of patients with frontal sinus involvement, 40% were managed with adjuvant external approaches, suggesting that an adjuvant external procedure may be needed for complete surgical excision in the case of frontal sinus involvement.

Discussion

• Based on a published recurrence rate of 10-20%, our study population had a comparable recurrence rate of 18% (3 of 17).
• However, all recurrences in our study group were already recurrent and had undergone previous surgery at the time that they presented to us. The other 14 patients all presented for primary treatment of inverted papilloma, and none experienced a recurrence during the follow-up period.
• Of patients with frontal sinus involvement, 40% were managed with adjuvant external approaches, suggesting that an adjuvant external procedure may be needed for complete surgical excision in the case of frontal sinus involvement.
• Our results suggest that the use of CT scan with adjuvant MRI when indicated provides adequate information regarding extent of disease.

Conclusions

• Inverted papilloma that has recurred once may be more likely to recur.
• The presence of frontal sinus involvement appears to be another significant negative prognostic indicator, primarily due to the difficulty associated with adequately visualizing these tumors. Consequently, it is important to take frontal sinus involvement into account when planning a surgical approach.
• Recurrence rates between open and endoscopic approaches are generally comparable. The present series confirms the utility of endoscopic management of these unusual neoplasms, and supports the preponderance of recent research demonstrating comparable levels of surgical control and recurrence rates with traditional surgical methods.

Methods and Materials

Study Design: Retrospective chart review of 17 patients (13 males, 4 females) who underwent surgical resection of sinonasal inverted papilloma at an academic tertiary care center.

Inclusion Criteria: Patients with a preoperative pathologic diagnosis of inverted papilloma who had a definitive procedure performed between 2001 and 2008 at Wayne State University, with preoperative staging by CT, MRI or both. Definitive surgical procedures included functional endoscopic sinus surgery (FESS), transnasal endoscopic medial maxillectomy (TEMM), or external surgical procedure for total removal of sinonasal inverted papilloma.

Exclusion Criteria: Patients without a confirmed diagnosis of inverted papilloma, patients without preoperative imaging, and patients in whom a definitive surgical procedure was not performed after a prior diagnostic FESS for presumed inflammatory disease.

Evaluation Criteria: A retrospective assessment was performed to evaluate the stage of the lesion, the type of imaging used to determine stage, type of surgical procedure performed, duration of follow-up, association with malignancy, recurrence and complications.

Summary Tables:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Complication Rate</th>
<th>Malignancy Rate</th>
<th>Recurrence Rate</th>
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<tbody>
<tr>
<td>FESS</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>TEMM; 2 external</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>CT</td>
<td>20% (CSF leak)</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>MRI</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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Fig. 1: Staging versus Patient Management

Stage 1 = tumors completely localized to the nasal cavity
Stage 2 = tumors involving the ethmoid or medial maxillary sinuses
Stage 3 = tumors involving the superior, lateral, inferior or posterior maxillary sinus, sphenoid sinus, or the frontal sinus
Stage 4 = tumor extends outside of the sinuses to include surrounding tissues

Limitations of Study

• Small sample size of 17 patients, although meaningful given the relative infrequency of this disease.
• With only one T4 lesion and 4 patients with frontal disease, it is difficult to make generalizations about these types of patients.
• Furthermore, 5 patients were lost to follow-up, which may also bias the conclusions of the present research.
• While the mean time to follow-up was 15.4 months, it is possible that recurrences may occur with greater delay, thereby altering the present observations.

Krouse staging system

Stage 1 = tumors completely localized to the nasal cavity
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Stage 4 = tumor extends outside of the sinuses to include surrounding tissues