Management of Odontogenic Cysts by Endonasal Endoscopic Techniques: A Systematic Review and Case Series

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Abstract

Background: Odontogenic cysts and tumors of the maxilla may be amendable to management by endonasal endoscopic techniques. This may reduce the morbidity associated with open procedures, and avoid difficult reconstruction. A systematic review was performed to evaluate the feasibility and outcomes of endoscopic techniques in the management of different odontogenic cysts, and is accompanied by a case series of our experience.

Methods: Preferred Reporting Items for Systematic Reviews was used to identify English-language studies reporting the use of endoscopic techniques in the management of odontogenic cysts. Publications were evaluated for the technique used, including pathophysiology, complications, recurrences, and follow-up period. A case series of patients undergoing treatment of odontogenic cysts by an endoscopic technique was assembled.

Results: Systematic review identified 16 case reports or series describing the use of endoscopic techniques for the treatment of odontogenic cysts, including 45 total patients. Cysts encountered were radicular (n=16) and dentigerous cysts (n=10), and keratocystic odontogenic tumor (n=12). There were no reported recurrences or major complications for a mean follow up of 29 months. A case series of patients in our institution identified 7 patients with a mean follow-up of 10 months.

Conclusions: Endonasal endoscopic resection of various odontogenic cysts has been described in the literature, and has been associated with effective treatment of these lesions in an average follow-up period of over 2 years. This has the potential to reduce morbidity associated with the resection of these lesions, although comparative studies would better define specific indications.

Introduction

Traditionally odontogenic cysts have been treated by enucleation, curettage, and marsupialization.1 The optimal management strategy for odontogenic cysts is controversial, particularly regarding the extent of resection for KCOT.2 There is a predilection for recurrence in cases of KCOT and this may be related to the pathophysiology of these lesions and the treatment technique.

Numerous reports over the last 10 years describe endonasal endoscopic techniques in the management of odontogenic cysts of the maxilla.2,3 The presumed benefit of an endoscopic approach is avoidance of morbidity associated with open, transpalatal approaches, including alterations in dentition, oroantral fistula, chronic rhinosinusitis, and extended recovery time.2,3 Open approaches can also result in more complex reconstruction than an endonasal technique.3 Differentiation of odontogenic cyst histopathology preoperatively can be difficult, in which case endoscopic management offers a potentially diagnostic and therapeutic approach.4

Methods and Materials

A systematic review was performed according to Preferred Reporting in Systematic Reviews and Meta-analyses (PRISMA) guidelines, on the outcomes of endonasal endoscopic management of odontogenic cysts. Publications were evaluated for the surgical technique employed and the lesion histopathology. Outcome measures of interest were reported complications, recurrences, and follow-up period.

Systematic search of the MEDLINE (Pubmed and OVID portals), EMBASE, and Cochrane Review databases was performed for all English language articles published between January 1, 1950 and October 1, 2016. Search criteria included all occurrences in the title or abstract of the terms “odontogenic” and “endoscopic.” A retrospective review of patients presenting to a tertiary otolaryngology clinic with a diagnosis of an odontogenic cyst was performed, from March 1, 2010 to October 24, 2016. Those patients treated by an endonasal endoscopic technique were included in a case series. Medical records were evaluated for the surgical technique, histopathology, complications, recurrences, and follow-up period.

Results

A total of 138 articles were identified through the defined search strategy within the MEDLINE, EMBASE, and Cochrane Review databases. Review of the articles and abstracts after duplicate removal identified 15 articles for full text review. An additional 2 studies were identified for inclusion from the reference lists of articles undergoing full text review. From these articles, 16 studies were determined to meet the stated search criteria.

Studies included in the systematic review are summarized in Table 1. The 16 included studies, a total of 45 patients were treated for different odontogenic cysts using a variety of endonasal endoscopic techniques. No recurrences were reported, and the weighted mean follow-up was 29.2 months. The mean follow up of cases of KCOT was 21.6 months. No major complications were reported, with persistent inferior meatus accessory ostia in a single patient.

A retrospective review identified 7 patients who were treated by an endonasal endoscopic technique (Table 1). The reported histopathology included 4 KCOT, 2 dentigerous cysts, and 1 radicular cyst. The mean follow-up period was 10 months. There were no major complications, and two minor complications. One patient was treated for acute sinusitis at 1 week following surgery, and another patient developed a mucocele within the treated maxillary sinus 12 months after the original surgery.

A pooled analysis of recurrence and complication rates was performed with subjects identified in this case series. There were no reported recurrences in the articles reviewed or in our case series. No major complications were reported, with the minor complications of an accessory ostia, acute sinusitis, and mucocele each respectively identified in one patient. The overall minor complication rate was 5.8%.

Discussion

Open and transpalatal techniques have been the traditional approach to the treatment of odontogenic cysts.6 There has been some controversy regarding the extent of resection necessary to avoid recurrences, particularly in the treatment of KCOT.7 Nevertheless, endonasal endoscopic management of odontogenic cysts of the maxilla, including KCOT, has been repeatedly described over the last 10 years in a total of 52 patients. Even in cases of locally aggressive KCOT, the recurrence rate appears to be comparable to open approaches, although follow-up remains limited.7,8

A systematic review of endonasal endoscopic techniques have been used in the treatment of odontogenic cysts, including maxillary cystography, “mega-antrostomy,” modified maxillary antrostomy, and maxillary sinus wall transposition. The extent of the maxillary antrostomy may depend upon the size sufficient for adequate access for complete marsupialization of the odontogenic cyst (Figure 1 and 2). A complete endoscopic maxillary antrostomy does not need to be the default surgical approach for all maxillary odontogenic tumors. At our institution, we approach these lesions by performing an initial maxillary antrostomy and then enlarging that opening to the size necessary to achieve the surgical objective.

Conclusions

Endonasal endoscopic treatment of odontogenic cysts has been described in multiple reports over the last 10 years, and include radicular, dentigerous, and keratocystic odontogenic tumors at the University of Texas Health Science Center at Houston.

Table 1. Case Series of Patients Treated by an Endonasal Endoscopic Technique

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Pathology</th>
<th>Treatment</th>
<th>Recurrence</th>
<th>Complications</th>
<th>Follow-up (Months)</th>
<th>Image Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>M</td>
<td>KCOT</td>
<td>Extended maxillary antrostomy</td>
<td>No</td>
<td>None</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td>KCOT</td>
<td>Endoscopic medial maxillectomy</td>
<td>No</td>
<td>None</td>
<td>5</td>
<td>Yes</td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>KCOT</td>
<td>Maxillary antrostomy, inframarginal window</td>
<td>No</td>
<td>Mucocoele</td>
<td>16</td>
<td>Yes</td>
</tr>
<tr>
<td>67</td>
<td>M</td>
<td>KCOT</td>
<td>Extended maxillary antrostomy</td>
<td>No</td>
<td>None</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>35</td>
<td>F</td>
<td>Dentigerous cyst</td>
<td>Maxillary antrostomy</td>
<td>No</td>
<td>Acute Sinusitis</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>34</td>
<td>M</td>
<td>Dentigerous cyst</td>
<td>Maxillary antrostomy</td>
<td>No</td>
<td>None</td>
<td>38</td>
<td>No</td>
</tr>
<tr>
<td>54</td>
<td>M</td>
<td>Radicular cyst</td>
<td>Extended maxillary antrostomy</td>
<td>No</td>
<td>None</td>
<td>4</td>
<td>Yes</td>
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</table>

References


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Figure 1. (A) A maxillary antrostomy is performed and the KCOT is visualized with thin endoscopes. (B) The KCOT is decompressed. (C) The cyst is widely marsupialized.

Figure 2. The KCOT has been widely marsupialized into the maxillary sinus cavity. The distal tip of the curved suction is confirmed in the inferior and lateral extent of the lesion using image guidance.

Figure of the endonasal endoscopic technique for treatment of odontogenic cysts available at en1t4.me/2017AHS

*This study was supported by an institutional grant from a private foundation.*