Objective: To determine the relation of maxillary sinus retention cysts (RCs) to ostiomeatal complex (OMC) obstruction and anatomic variation of the paranasal sinuses.

Methods: The results of 410 computed tomographic scans of the sinuses ordered by otolaryngologists in an academic center during a 1-year period were reviewed. Computed tomographic scans with maxillary sinus RCs were studied to determine cyst characteristics, the Lund score, OMC size and patency, and the presence of anatomic variations. Statistical analysis was conducted to determine the relation of RCs to these factors.

Results: The incidence of RCs was 12.4% (51 cases). The mean patient age was 41.3 years, with a female-male ratio of 2.4:1. Nine cases demonstrated bilateral cysts, allowing 42 unilateral cases to be analyzed with the non-diseased side as a control. The mean cyst size was 1.56 cm, and cysts were most commonly located inferiorly (30 [50%]) and were solitary (45 [88%]). The RC side had a higher mean Lund score than the control side (2.62 vs 1.93; P= .008, Wilcoxon signed rank test). Of the cyst sides, 18 (43%) demonstrated OMC occlusion, vs 15 (36%) for the control side (P=.55, McNemar test). The mean OMC size was smaller for the cyst side vs the control side (0.77 vs 1.35 mm; P=.13). No association was found between RCs and concha bullosa or Haller cells (P=.45 and P=.39, respectively).

Conclusions: Maxillary sinus RCs do not reflect persistent obstructive pathology of the OMC, and are not associated with potentially obstructive anatomic sinus variations. Consideration should be given to not scoring RCs as positive disease during Lund staging.

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PATIENTS AND METHODS

The results of 410 CT scans of the sinuses ordered by otolaryngologists in an academic center during a 1-year period were reviewed. These coronal CT scans were ordered as part of the clinical evaluation of patients with chronic rhinosinusitis, when 1 or more of the criteria for the diagnosis of chronic rhinosinusitis were present according to the American Academy of Otolaryngology–Head and Neck Surgery guidelines. From this group, patients with maxillary sinus RCs were identified. For the purposes of classification, the following characteristics were required for the radiographic diagnosis of a maxillary sinus RC: (1) a homogeneous dome-shaped cyst with sharp demarcation of the lateral borders; (2) absence of bony destruction; (3) absence of communication with tooth roots (to exclude dentigerous cysts); and (4) a smooth, spherical outline along the free border of the cyst.

Patient demographics were recorded. The CT scans with maxillary sinus RCs were studied to determine characteristics of the cysts, including the location, number, and size of the cysts. The size of the cyst was measured in its longest dimension. In patients with multiple cysts in a single maxillary sinus, location and size were evaluated for the largest cyst. For each patient, the size and patency of the maxillary sinus infundibulum (ostiomeatal complex [OMC]) were recorded for both sides. The type of radiographic disease in each maxillary sinus was subclassified as mucosal thickening alone, RC alone, mucosal thickening and RC, or normal. The presence or absence of Haller cells, concha bullosa, or other anatomic variations was noted.

Statistical analysis was conducted using the Statistical Package for Social Sciences system, version 9.0 (SPSS Inc, Chicago, Ill). Descriptive statistics were computed for all cases. Next, cases with bilateral RCs were excluded, and the remaining unilateral cases were examined, with the nondiseased (necyst) side as a control. The Lund scores and the sizes of the OMC for the cyst side and the control side were compared with the Wilcoxon signed rank test. The McNemar test was used to determine the association between the presence of OMC occlusion and the presence of a cyst. Similarly, the McNemar test was used to determine the association between RCs and Haller cells and concha bullosa.

PATIENTS WITH CHRONIC RHINOSINUSITIS

In only 1 case was the cyst itself found to be obstructing the maxillary infundibulum. The RC side had a higher mean Lund score than the control side (P = .008, Wilcoxon signed rank test). Occlusion of the OMC was found in more of the cyst sides than the control sides (P = .55, McNemar test). The mean OMC size was smaller for the cyst side vs the control side, but this was not statistically significant (P = .13, Wilcoxon signed rank test). No association was found between the presence of RCs and concha bullosa or Haller cells (P = .45 and P = .39, respectively; McNemar test). These data are summarized in the Table.

Based on these data, a corrected Lund score was computed for the disease side. The corrected Lund score was computed by treating maxillary sinus RCs as “no disease” in scoring; if there was mucosal disease within the sinus in addition to the RC, that sinus was scored as diseased. This resulted in a corrected mean Lund score of 1.86 for the diseased side, which was not statistically different from the control side (Lund score, 1.93; P = .93, Wilcoxon signed rank test).

Maxillary sinus RCs are classically described as dome-shaped lesions originating from the mucosa within the maxillary sinus. These cysts make up one of the most common incidental findings within the paranasal sinuses. Several studies have documented incidences ranging from 4.3% to 8.7% by plain radiography in the general patient population. This percentage may approach 10% or greater if more sensitive sinus imaging modalities such as CT or magnetic resonance imaging are used. This study found an incidence of maxillary sinus RCs of 12.4% in a group of patients seeking care for presumed sinusonal disease. This compares with an incidence of 16.4% found by Scribano et al in a similar patient population. It would appear that maxillary sinus RCs occur somewhat more frequently in patients with symptoms of chronic rhinosinusitis than in asymptomatic patients.

Because of the relatively high incidence of maxillary sinus RCs in the normal population, it is important to determine if these should be considered pathological. Especially in patients who present with clinical symptoms compatible with a diagnosis of chronic rhinosinusitis, whether to consider such cysts as manifestations of inflammatory or obstructive sinus disease becomes clinically important. In addition, with the continued emphasis on CT scan stag-

### Table: Summary of Control and Diseased Side Data

<table>
<thead>
<tr>
<th>Variable</th>
<th>RC Side (n = 42)</th>
<th>Control Side (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lund score, mean (SD)</td>
<td>2.62 (1.65)</td>
<td>1.93 (1.99)</td>
</tr>
<tr>
<td>OMC size, mean (SD), mm</td>
<td>0.77 (0.80)</td>
<td>1.35 (1.98)</td>
</tr>
<tr>
<td>OMC obstruction</td>
<td>18 (43)</td>
<td>15 (36)</td>
</tr>
<tr>
<td>Haller cell</td>
<td>8 (19)</td>
<td>5 (12)</td>
</tr>
<tr>
<td>Concha bullosa</td>
<td>10 (24)</td>
<td>14 (33)</td>
</tr>
<tr>
<td>Disease type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mucosal disease alone</td>
<td></td>
<td>14 (33)</td>
</tr>
<tr>
<td>Cyst alone</td>
<td>32 (76)</td>
<td></td>
</tr>
<tr>
<td>Disease and cyst</td>
<td>10 (24)</td>
<td></td>
</tr>
<tr>
<td>No pathological features</td>
<td></td>
<td>28 (67)</td>
</tr>
</tbody>
</table>

*Data are given as the number (percentage) in each side, unless otherwise indicated. RC indicates retention cyst; OMC, ostiomeatal complex; and ellipses, data not applicable.

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The existence of anatomic variations alone did not result in the formation of maxillary sinus RCs as positive radiographic disease in the Lund scoring system.

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REFERENCES