Chronic rhinosinusitis is a common entity diagnosed and treated by otolaryngologists. This frequently includes the maxillary sinus and is treated medically and surgically. Surgical intervention commonly involves endoscopic sinus surgery with creation of a maxillary antrostomy. This entails removal of tissue from the medial wall of the maxillary sinus that borders the natural os. When an accessory or secondary os is identified, it is generally accepted that this should be connected to the natural os to prevent recirculation of secretions between the two ostia. Failure to connect these two ostia is one of the most common complications of maxillary sinus surgery. However, no publications could be found regarding patients in whom maxillary sinus accessory ostia are identified, but imaging does not reveal significant opacification of the sinus. Despite symptoms consistent with chronic rhinosinusitis, these patients are generally not offered surgical intervention due to the lack of findings on radiographic imaging. The aim of this study was to determine if the presence of maxillary sinus accessory ostia could be used as an indicator of the state of the mucosal ciliary area.

Biopsy specimens were taken from 18 maxillary sinuses. Group A included 6 sinuses. Group B included 9 sinuses. 3 specimens were damaged in processing and did not yield at least 3 analyzable images. These specimens were not analyzed.

We determined the average CA and level of opacification for each specimen as well as the averages for groups A and B. Analysis of covariance was used to determine if group B showed a trend toward decreased CA independent of level of opacification on CT. Statistical significance was determined using a p-value of less than or equal to 0.05.

CA for specimens in group A ranged from 26% to 100% with an average of 75%. Level of opacification for specimens in group A ranged from 0 to 27.6 mm with an average of 5.3 mm. CA for specimens in group B ranged from 0% to 61% with a group average of 24%. Level of opacification for specimens in group B ranged from 0 to 26.7 mm with an average of 6.3 mm. When controlling for level of opacification, group A showed 75.0% ciliary area, while group B showed 23.7%. This difference was statistically significant (p=0.0084).

Our research aim was to determine if the presence of maxillary sinus accessory ostia could be used as an indicator of the state of the maxillary sinus mucosa independent of CT opacification.

The results in Table 1 show a pattern with the small sample size evaluated. They suggest the presence of maxillary sinus accessory ostia may in fact be associated with increased mucosal disease independent of CT findings.

A few weaknesses of this study should be mentioned. The sample size is small. Min’s method only measures one specific dimension on CT and is not widely used clinically. Formal blinding was not employed for SEM analysis. Finally, while SEM and CA are used in rhinologic research to study chronic rhinosinusitis, their clinical applicability is not as widely accepted.

Our small sample size suggests the presence of maxillary sinus accessory ostia may in fact be associated with increased mucosal disease independent of CT findings. This concept has the potential to change the way we diagnose and treat patients who have maxillary sinus accessory ostia but little or no opacification on CT. We are currently expanding the study to further investigate this concept.

### RESULTS

<table>
<thead>
<tr>
<th>Group</th>
<th>CT (Min’s)</th>
<th>Avg. CA</th>
<th>CA Corrected for Min’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5.3 mm</td>
<td>75%</td>
<td>75.0%</td>
</tr>
<tr>
<td>B</td>
<td>6.3 mm</td>
<td>24%</td>
<td>23.7%</td>
</tr>
</tbody>
</table>

p=0.0084. This is a statistically significant difference demonstrating Group B (accessory os) has significantly less ciliary area than Group A (no accessory os).

### CONCLUSIONS

Our small sample size suggests the presence of maxillary sinus accessory ostia may in fact be associated with increased mucosal disease independent of CT findings. This concept has the potential to change the way we diagnose and treat patients who have maxillary sinus accessory ostia but little or no opacification on CT. We are currently expanding the study to further investigate this concept.

### REFERENCES

6. Min’s method was chosen for CT analysis due to its precise and reproducible measurement of thickness of opacification at the lateral wall of the maxillary sinus.