Acute Unilateral Maxillary Atelectasis Following Endoscopic Pituitary Surgery

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Background

- Chronic maxillary atelectasis (CMA) is an acquired condition of persistent and progressive antral wall collapse causing a reduction in maxillary sinus volume.
- Thought to be secondary to ostiomeatal obstruction and development of negative intra-sinus pressure gradients.
- Classified into three stages (Table 1)
- CMA can result in sinonasal symptoms (nasal obstruction, nasal congestion, facial pressure/pain), ophthalmological signs (hypoglobus, enophthalmos, diplopia) and facial asymmetry.
- Diagnosis is made radiologically
- Maxillary atelectasis occurring rapidly after pituitary surgery, despite a normal pre-operative CT scan, has not previously been described.

Case Presentation

- A 29-year-old male presented two months post endoscopic transnasal, trans-sphenoidal excision of a Rathke’s cleft cyst of the pituitary gland with facial pain and pressure, unresponsive to medical treatment.
- Onset of symptoms developed shortly after surgery.
- CT of the paranasal sinuses at five months post-operatively demonstrated evidence of an atelectactic left maxillary sinus, which was not present on pre-operative imaging, performed 2 weeks prior to the initial pituitary surgery (Figures 1 and 2)
- He underwent endoscopic uncinctomy and middle meatal antrostomy with complete resolution of symptoms.

Discussion

- This case presentation challenges the notion that CMA, as implied by its name, always carries a chronic and indolent course.
- Review of the literature has demonstrated six cases of documented rapid-onset atelectasis of maxillary sinuses. Four of these cases were post-operative, with one involving direct surgery on the affected sinus.
- While lateralisation of the middle turbinate causing ostiomeatal obstruction may lead to sinus atelectasis, it is typically a slow process and often seen in the context of chronic disease.
- In our case, the left maxillary ostium and uncinate were not directly involved in the initial procedure. We speculate that lateralisation of the middle turbinate or the use of septal splints may possibly have contributed to ostium obstruction.

Conclusion

- This case represents the first in the literature of acute, post-operative unilateral maxillary atelectasis following pituitary surgery, where the affected sinus was not directly involved in the initial operation.
- Acute maxillary atelectasis is a rare entity, which can be successfully managed with minimally invasive sinus surgery.
- Consideration should be made to incorporate acute cases into the current classification system of maxillary atelectasis.

Table 1. Staging of chronic maxillary atelectasis

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CMA Stage I</th>
<th>CMA Stage II</th>
<th>CMA Stage III</th>
<th>Silent Sinus Syndrome (SSS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deformity</td>
<td>Membranous</td>
<td>Bony</td>
<td>Clinical</td>
<td></td>
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<tr>
<td>Characteristic features</td>
<td>Lateralised maxillary fontanelle</td>
<td>Inward bowing of 1+ osseous of maxillary antrum</td>
<td>Enophthalmos, hypoglobus, and/or mid-facial deformity</td>
<td></td>
</tr>
<tr>
<td>Enophthalmos?</td>
<td>Absent</td>
<td>Absent</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Sinusitis symptoms or facial pain?</td>
<td>Absent or present</td>
<td>Absent or present</td>
<td>Absent or present</td>
<td>Absent</td>
</tr>
</tbody>
</table>

Figure 1. CT paranasal sinuses prior to endoscopic pituitary surgery demonstrating normal maxillary sinuses.

Figure 2. CT paranasal sinuses five months post endoscopic pituitary surgery demonstrating an atelectactic and opacified left maxillary sinus with a lateralised uncinate process.