Acquired Post-Infectious Silent Sinus Syndrome in a Pediatric Patient

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Introduction

- **Silent Sinus Syndrome (SSS)** is a rare condition marked by progressive **maxillary sinus atelectasis**. It is infrequently observed in pediatric patients.
- **Pathophysiology** centers on obstruction of the maxillary ostiomeatal complex, leading to hypoventilation of the maxillary sinus and causing gradual resorption of air within the sinus, generating **negative pressure**. Over time, this negative pressure results in inward bowing and collapse of the maxillary sinus walls, including the orbital floor.
- While often idiopathic**, predisposing factors** for SSS include anatomical variations (deviated septum, lateralized uncinate, septal spurs), maxillary dental disease/surgery altering sinus drainage, and occasionally prior sinusitis.
- Surgical treatment with Functional Endoscopic Sinus Surgery is the mainstay of management in children.
- Here we present a rare case of acquired post-infectious SSS with radiography demonstrating progression of obstruction to atelectasis.

Methods

This is a case report of a single patient treated at our institution between 2023-2025.

Case Presentation

Patient:

- 11-year-old female with a history of chronic sinusitis, otherwise healthy.

Presentation:

- Patient was in her usual state of health until January 2023 when she was transferred to our facility for management of post-COVID sinusitis, which was complicated by Streptococcus pyogenes septic shock and preseptal orbital cellulitis.
- Initial CT imaging of the sinuses revealed symmetric maxillary sinuses with complete opacification on the right side (Figure 1a, b).

Case Presentation (cont.)

Presentation (cont.):

- Ophthalmology consulted for mild preseptal cellulitis and strabismus, no acute ophthalmic intervention.
- Patient was successfully treated medically and subsequently underwent adenoidectomy two months later.
- Despite treatment with maintenance Flonase and Astepro, she continued to experience recurrent sinusitis over the following 1.75 years.
- A follow-up CT scan of the sinuses revealed significant right maxillary sinus atelectasis and bowing of the inferior orbital wall (Figure 1c, d).
- Patient was found to have right V2 paresthesia. Subjective enophthalmos was noted by the mother.

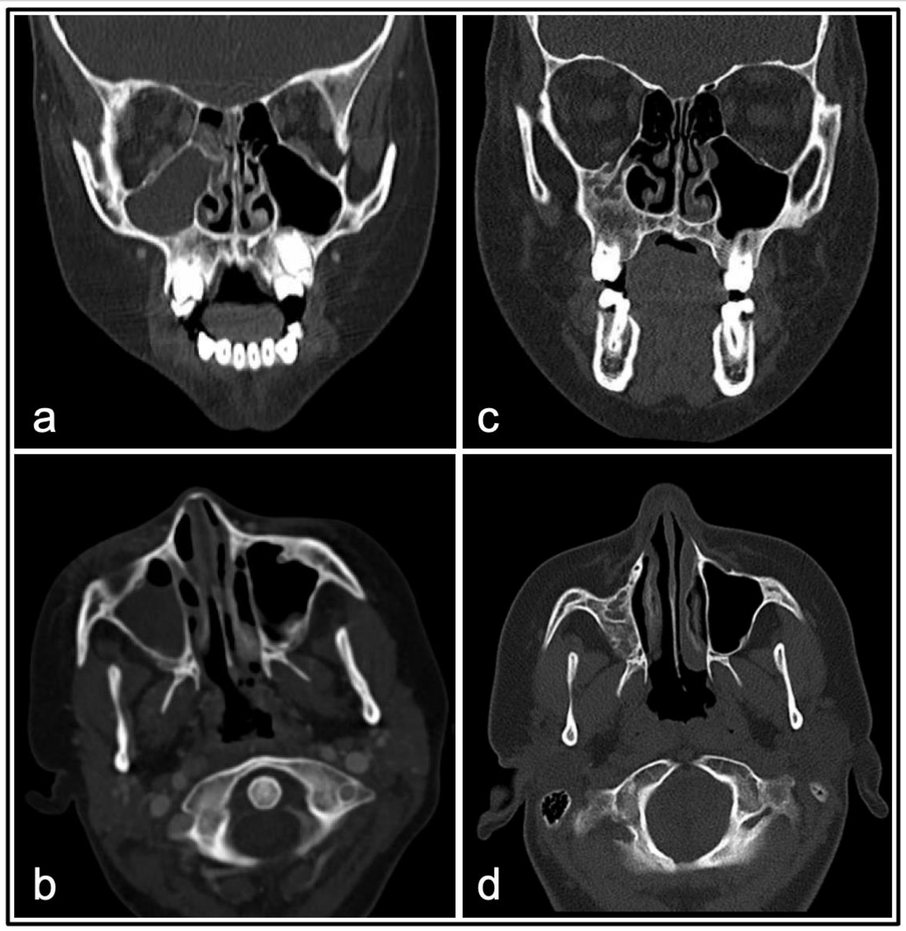

Figure 1: Radiological progression of post-infectious SSS. (a) coronal and (b) axial head CT performed 2/2023. (c) coronal and (d) axial head CT performed 1/2025.

Case Presentation (cont.)

Procedures:

- Nasal sinus endoscopy with maxillary antrostomy

Intraoperative findings:

- Paradoxical curvature of the right middle turbinate with lateral displacement resulting in near complete blockage of the middle meatus
- Right uncinate process scared to the ethmoid bulla.
- Right maxillary sinus significantly contacted with scar tissue present.

Postoperative course:

- Nasal saline rinses BID
- Daily Flonase
- Continues to do well symptomatically without evidence of recurrent sinusitis
- 4-month post-op nasal endoscopy revealed healthy appearing mucosa
- Right V2 and subjective enophthalmos resolved

Summary

- This case highlights a rare instance of acquired post-infectious silent sinus syndrome in a pediatric patient.
- Radiographic images demonstrate the natural progression of the disease process, beginning with sinus opacification and progressing to complete atelectasis.
- The patient underwent right maxillary antrostomy to address maxillary sinus patency, and she continued to do well symptomatically post-op without evidence of recurrent sinusitis.

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