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Odontogenic Sinusitis: An Under Recognized Source of Complicated Sinusitis

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Abstract

Background: Odontogenic sinusitis (ODS) is a more common clinical entity than historically reported and is under-represented in the literature. While this unique subtype of infectious sinusitis is most often chronic with varying degrees and severity of sinonasal symptoms, it can present acutely (or as acute on chronic) with orbital, intracranial, or osseous infectious complications. Given the overall paucity of literature with respect to ODS, and an even greater understudy of complicated ODS, the incidence is not well understood. Further, dental disease is likely often under-recognized as the etiology of complicated sinusitis. The purpose of this study is to both bring attention to, and to report on the incidence of, complicated ODS.

<u>Methods</u>: A retrospective chart review of patients of a single rhinologist who underwent endoscopic sinus surgery for ODS and/or extrasinus complications of sinusitis at a tertiary medical center was performed from January 1, 2024 – June 30,

Results

Patient	Sex	Age	Culture	Complication	Type of sinusitis
1	Male	19 yr	Streptococcus constellates	Orbital + Intracranial	Acute complex sinusitis
2	Female	6 yr	Streptococcus pyogenes	Orbital	Acute complex sinusitis
3	Male	15 yr	Streptococcus pneumoniae	Orbital + Intracranial	Acute complex sinusitis
4	Male	4 yr	Streptococcus pneumoniae	Orbital	Acute complex sinusitis
5	Female	80 yr	Streptococcus intermedius, Methicillin-sensitive Staphylococcus aureus, Escherichia coli, Proteus	Intracranial	Complex ODS
6	Female	62 yr	Streptococcus anginosus	Osseous	Complex ODS
7	Male	65 yr	Moraxella catarrhalis, Staphylococcus epidermidis	Osseous	Complex ODS
8	Male	9 yr	Parvimonas micra	Orbital	Complex ODS
9	Female	27 yr		Simple	ODS
10	Male	63 yr		Simple	ODS
11	Female	58 yr	Staphylococcus aurues	Simple	ODS
12	Female	42 yr		Simple	ODS
13	Female	61 yr		Simple	ODS

2024. Outcomes were reviewed.

Results: A total of 13 patients with ODS were treated by endoscopic sinus surgery in the 6 month inclusion window. Of these, 4/13 (30.7%) had complicated ODS - 1 intraorbital, 1 intracranial, and 2 osseous complications. Further, during the 6 month inclusion window, 8 patients were treated with complex sinusitis of all etiologies - 3 intraorbital abscesses, 1 intracranial abscess, 2 osseous complications, and 2 with both intraorbital and intracranial abscess. Of the patients with extrasinus complications of sinusitis, 50% were of odontogenic origin. At the time of initial surgery, the dental component was not addressed in any of these patient. There were 2 instances of initial surgical failure. One patient was returned to OR with dental extraction and resolution of disease. The other treatment failure was lost to follow up prior to addressing odontogenic source.

Conclusion: Extrasinus complications of odontogenic sinusitis may be more common than previously reported. Further, in patients with intraorbital, intracranial, or osseous complications of sinusitis, a dental source may be more common than previously recognized, and must be closely considered. As demonstrated, surgical management of the sinusitis and the acute extrasinus complication alone may yield suboptimal outcomes if the dental source is not concurrently managed.

Introduction

In patients with bacterial rhinosinusitis, the infection can extend into neighboring compartments - including intraorbital, intracranial and osseus spaces - in anywhere from 3-20% of patients. The orbit is the most common site of extrasinus complications, seen in 60-80% of patients with complex sinusitis. Orbital and osseus complications have been shown to be more common in pediatric patients, while intracranial complications tend to occur in young adults.¹ These complications can be fatal, and an understanding of their pathology is essential to appropriate treatment.

Though most sinusitis is rhinologic in origin, odontogenic sinusitis is an important subset of sinus disease. Given the proximity of the maxillary molars to the sinuses, infections can penetrate through the Schneiderian membrane.² Odontogenic sinusitis first spreads to the maxillary sinuses, given the close proximity; the incidence of maxillary sinusitis due to dental disease is thought to be as high as 30%.³ The etiology of odontogenic sinusitis is multifactorial, including apical periodontitis, oroantral fistulas, dental treatment with foreign bodies, and more.⁴

Despite the high prevalence of odontogenic sinusitis, it has been less studied than rhinologic sinusitis, and the prevalence of complications related to it is not well understood. A prior systematic review showed that complicated odontogenic sinusitis was more prevalent in adult men, presented unilaterally, and the etiology was most often apical periodontitis of maxillary molars.⁵ The etiology of intracranial, intraorbital and osseus spread of odontogenic sinusitis is not well understood. Numerous reports suggest that hematogenous spread through veins in maxillary alveolar marrow spaces or submucosally through oral or facial veins may play a role.⁶ A high-risk feature of complicated odontogenic sinusitis is an increased rate of permanent vision loss.⁷ Given the high-risk features and prevalence of odontogenic sinusitis, further study into extra-sinus complications is warranted. This study presents a retrospective chart review of patients of a single rhinologist who underwent endoscopic sinus surgery for ODS and/or extra-sinus complications of sinusitis at a tertiary medical center.

Study Design and Methods

Identification of Eligible Patients

Retrospective chart review of patients of a



Conclusion

- This retrospective chart review identified odontogenic sinusitis as a common etiology of extrasinus complications.
 - > 50% of complicated sinusitis was due to odontogenic disease
 - > 30.7% of patients with odontogenic sinusitis had extrasinus extention
- An odontogenic source should be considered for all cases of complex sinusitis. Without addressing the dental source, the infection may persist despite appropriate endonasal and/or orbital/cranial/osseous management.

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8 patients were treated with complex sinusitis of all etiologies - 3 intraorbital abscesses, 1 intracranial abscess, 2 osseous complications, and 2 with both intraorbital and intracranial abscess

50% were of odontogenic origin

4/13 (30.7%) had complicated ODS

> The microorganisms were those common of both rhinologic and odontogenic sinusitis.

Limitations of this study include the small sample size and inherent bias of single institution and single surgeon study. Statistical comparisons between study variables were not performed given the small sample size.

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