# Oral and Maxillofacial Pathology
## Case of the Month

## Clinical History

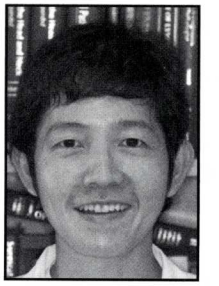
A 14-year-old Hispanic female was referred to an oral and maxillofacial surgeon for extraction of the third molars and a biopsy of a radiopaque lesion in the left maxillary sinus. The patient was asymptomatic. Clinical examination revealed no evidence of bony swelling. The patient denied any history of trauma or past surgery and she was not taking any medications. Her medical history was noncontributory. A panoramic radiograph showed a well-defined, dome-shaped radiopaque lesion in the left maxillary sinus, adjacent to the apices of tooth #15 and tooth bud #16 (Figure 1). In addition to extraction of the four wisdom teeth, a Caldwell-Luc procedure was performed and an excisional biopsy was obtained of the radiopaque lesion. The clinical diagnosis was of a mucocele.

Histological examination revealed a trisected soft tissue specimen consisting of sinus lining epithelium and underlying chronically inflamed granulation tissue, with exudates suspending inflammatory cells (Figure 2). No neoplasm was identified.

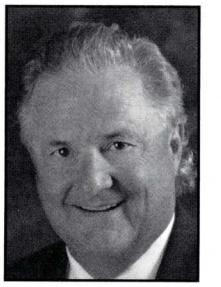
**What is your final diagnosis?**

**See page 1302 for the answer and discussion.**

Liang



Cheng



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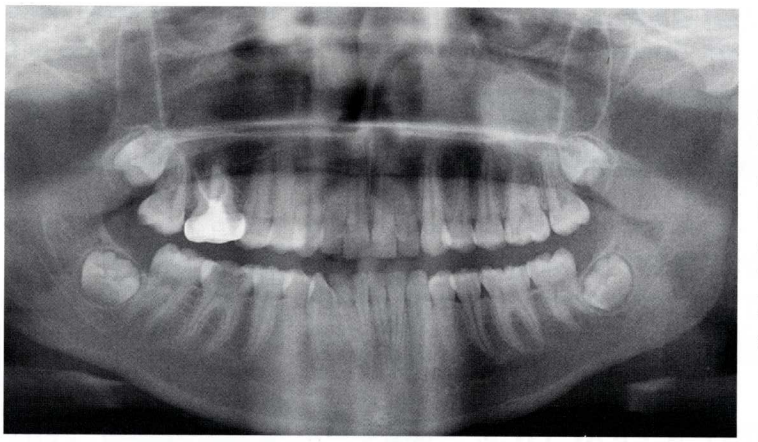

**Figure 1.** Panoramic radiograph showing a well-defined dome-shaped radiopaque lesion attached to the floor/wall of the left maxillary sinus.

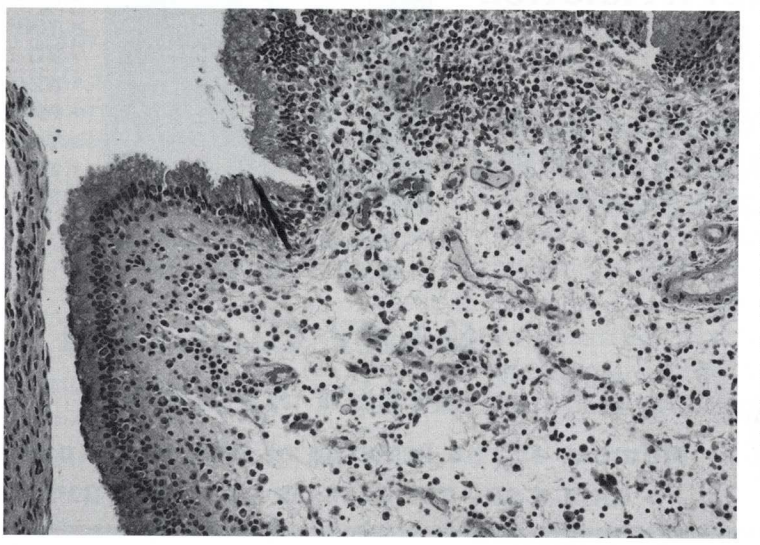

**Figure 2.** Photomicrograph showing the inflammatory exudates surrounded by chronic inflamed granulation tissue beneath the sinus lining epithelium (H&E stain, original magnification ×200).

# Antral Pseudocyst

Oral and Maxillofacial Pathology Case of the Month (from page 1286)

## Discussion

An antral pseudocyst is a common incidental finding on a panoramic radiograph and the prevalence varies from 1.5 percent to 14 percent of the population (1,2). It is caused by an inflammatory exudate that accumulates under the maxillary sinus lining epithelium. The exudate is often surrounded by connective tissue with a chronic inflammatory infiltrate. The inflammatory infiltrate is thought to be due to an odontogenic infection of the adjacent teeth, recurrent sinus infections, or allergies (1). An increased incidence of antral pseudocyst has been noted in the winter months, which suggests an association with an increased frequency of upper respiratory tract infections or irritations from dry, forced-air heating (1,3).

Patients with an antral pseudocyst rarely have any signs or symptoms, unless the pseudocyst is large and completely fills the maxillary sinus. In that case, it may cause nasal obstruction and postnasal discharge (3).

An antral pseudocyst typically presents as a dome-shaped, faintly radiopaque lesion on the floor of the maxillary sinus. However, they also can arise on the lateral, medial, anterior or posterior wall, or on the roof of the maxillary sinus (Figure 3A-C), and may project variations in its presentation on a panoramic radiograph (Figure 3D).

Therefore, the purpose of presenting this case is to increase awareness among dental practitioners of various presentations of antral pseudocysts. In this case, the base of the presenting pseudocyst appears to be not completely on the floor of the left maxillary sinus, and might also involve either the lateral or the anterior wall of the left maxillary sinus. Panoramic radiographs cannot determine the exact location because they are two-dimensional representations of three-dimensional structures. A cone beam computed tomography (CBCT) scan would be able to determine the exact location, but that information is not necessary in this case because the diagnosis of an antral pseudocyst can be made based on a panoramic radiograph. In addition, one or more pseudocysts may occur in one sinus or both sinuses of any given person. For example, a follow-up panoramic radiograph of the patient in this case was taken one year after the biopsy (Figure 4). While the left maxillary

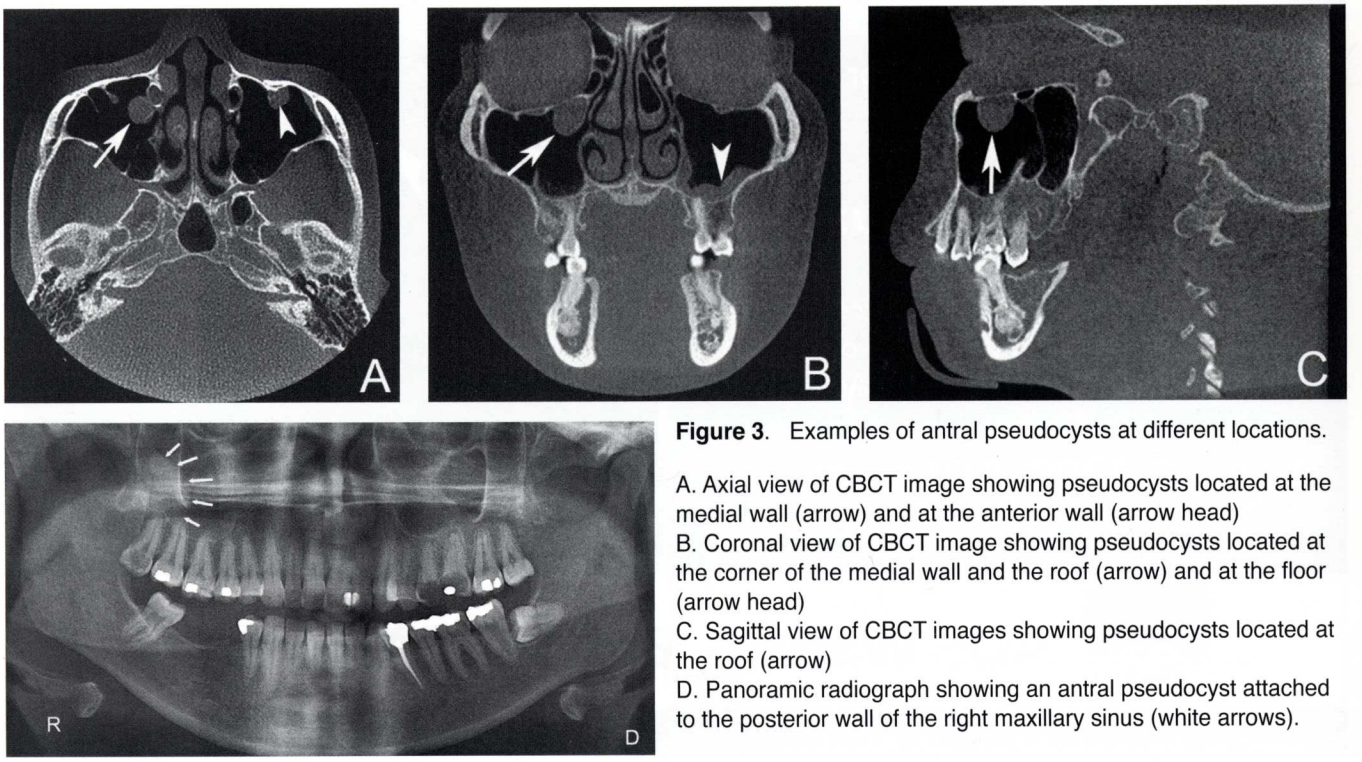


**Figure 3**. Examples of antral pseudocysts at different locations.

A. Axial view of CBCT image showing pseudocysts located at the medial wall (arrow) and at the anterior wall (arrow head)
B. Coronal view of CBCT image showing pseudocysts located at the corner of the medial wall and the roof (arrow) and at the floor (arrow head)
C. Sagittal view of CBCT images showing pseudocysts located at the roof (arrow)
D. Panoramic radiograph showing an antral pseudocyst attached to the posterior wall of the right maxillary sinus (white arrows).

sinus did not show any pseudocyst, there was a typical dome-shaped radiopacity on the floor of the right maxillary sinus (Figure 4, arrows).

The diagnosis of an antral pseudocyst usually can be made based on radiographic features, combined with clinical findings of no symptoms and no clinical expansion. There should be no perforation of the floor or walls of the sinuses and no displacement of the adjacent structures. As the accumulated inflammatory exudates can resolve spontaneously, treatment is not necessary. If the patient presents with symptoms and signs, such as facial fullness, pain or soreness upon palpation, or radiographical features of bony expansion or displacement of the floor or walls of the sinus, a biopsy is recommended to rule out other inflammatory diseases and neoplastic processes (4). The differential diagnoses for an antral pseudocyst include sinus mucocele, sinonasal polyps, sinusitis, and sinonasal carcinomas. Histological features can differentiate an antral pseudocyst from these other diseases.

In this patient's original radiograph, the radiopacity in the left sinus appeared to be more intense in density than a typical radiopaque lesion caused by a soft tissue mass. This may raise concern regarding a possible osseous neoplasm, such as an osteoma. However, in this case it was due to the superimposed image of the left inferior nasal turbinate (Figure 5), which increased the degree of radiopacity of the antral pseudocyst. It is important for dental practitioners to keep in mind that the inferior nasal turbinates sometimes can be superimposed on the maxillary sinuses on panoramic radiographs, and they may be confused with abnormal anatomy or a pathological process.

Recently, several case reports of maxillary sinus floor augmentations in the presence of antral pseudocysts have been published (5-7). All implants discussed in these cases were reported to be functioning successfully during follow-up periods. These reports indicate that it may not be necessary to remove an antral pseudocyst before sinus augmentation or during sinus augmentation (5,7). However, careful patient selection and detailed clinical and radiographic examinations must be performed before the surgery to avoid complications, especially in the presence of a large pseudocyst (6).

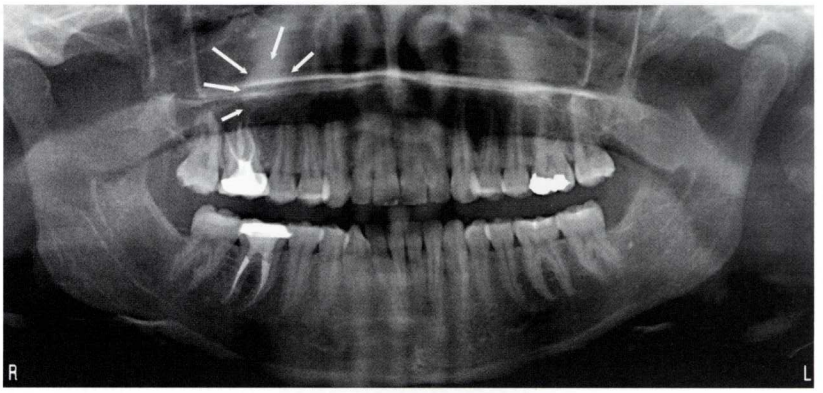


**Figure 4.** Panoramic radiograph of the same patient shown in Figure 1, taken one year after the original biopsy. It shows a typical dome-shaped antral pseudocyst in the right maxillary sinus (white arrows). No evidence of the previous antral pseudocyst in the left sinus is seen.

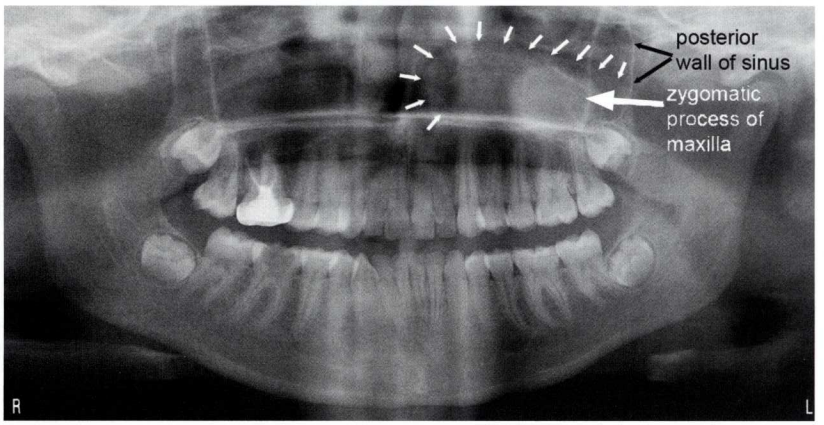


**Figure 5.** Panoramic radiograph showing the radiopaque inferior nasal turbinate (white arrows) superimposed on the left maxillary sinus. This superimposition is not as prominent in the right maxillary sinus as in the left sinus.

In conclusion, we have presented an interesting case of an antral pseudocyst to increase awareness of its variations in radiographic presentation and to point out the common superimposition of the normal anatomic structures seen in the maxillary sinus area.

Panoramic radiographs are routinely taken in dental offices. A broad knowledge in radiographic appearances of maxillary sinus diseases can help practitioners feel comfortable in diagnosing maxillary sinus abnormality commonly seen on panoramic radiographs.

## References

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