

# Management of a Radicular Cyst Encroaching the Maxillary Sinus in a Thrombocytopenic Patient: The Crucial Role of Oral Physicians in Careful Planning and Intervention

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## Abstract

Radicular cysts are common odontogenic cysts associated with the roots of non-vital teeth. When such cysts extend into the maxillary sinus, they pose diagnostic and therapeutic challenges, particularly in patients with systemic conditions like thrombocytopenia. This case report highlights the complexities involved in diagnosing and managing a radicular cyst in a patient with thrombocytopenia, with a particular focus on the critical roles played by oral physicians and maxillofacial radiologists. The case emphasizes the multidisciplinary approach required to handle maxillofacial lesions in patients with systemic hematologic disorders, ensuring both accurate diagnosis and safe, effective treatment.

**Keywords:** Radicular Cyst, Thrombocytopenia, Maxillary Sinus

## Introduction

Radicular cysts are the most common type of odontogenic cyst, usually arising from the inflammatory response to pulp necrosis in a non-vital tooth.<sup>1</sup> They most frequently occur in adults, particularly in the third to sixth decades of life, and are more common in the maxilla than in the mandible.<sup>2</sup>

These cysts often go unnoticed until they are large enough to cause symptoms, which is why their detection in clinical practice might depend on routine radiographic examinations.<sup>3</sup> The prevalence of radicular cysts, according to the latest research, ranges between 52% to 68% of all cysts of the jaws. These cysts are the most common type of odontogenic cysts, making up about 55% of odontogenic cysts specifically.<sup>4</sup>

Radicular cysts typically develop at the apex of a non-vital tooth root, but in some cases, they can extend or migrate into the maxillary sinus. This occurrence is unusual, with estimates suggesting it happens in less than

1% of all radicular cyst cases. When it does happen, it can pose diagnostic and treatment challenges due to the complexity of the anatomy and the potential for overlap with other sinus pathologies.<sup>5</sup>

Idiopathic Thrombocytopenia, characterized by a low platelet count, increases the risk of bleeding complications, necessitating careful planning and intervention.<sup>6</sup> This case report presents a unique instance where a radicular cyst encroached on the maxillary sinus in a thrombocytopenic patient, underscoring the essential role of an oral physician.

### Case Report

A 45-year-old male presented to the Department of Oral Medicine and Radiology with a chief complaint of swelling on the left side of the face, associated with pain for five months. The swelling, which initially appeared in the left midface region, gradually increased in size. Despite antibiotic treatment, the swelling persisted, accompanied by dull, intermittent, non-radiating pain that did not exacerbate with mastication, nasal obstruction and pain in the left midface during bending. The patient denied any history of fever, trauma, or discharge from the affected area. A month prior, the patient had sought care at a private dental clinic, where an aspirate of the swelling was taken. This procedure led to prolonged bleeding lasting approximately 20 days, which gradually subsided. A complete hemogram revealed thrombocytopenia with a platelet count of 60,000. Clinical examination showed a diffuse swelling over the left cheek, extending mediolaterally, from the left lateral surface of the nose to the left malar region, and superoinferiorly, from the infraorbital margin to the supralabial region, approximately 4x3cm respectively. (FIG 1) The overlying skin appeared normal, and palpation revealed a firm, non-compressible, non-fluctuant swelling with a smooth surface. Intraorally, a firm, immobile, tender swelling was present in the upper left buccal vestibule, adjacent to the canine to molar region, without any palatal extension. (FIG 2) The patient's hard tissue examination revealed multiple root stumps in the upper and lower anterior regions, along with several carious teeth, including maxillary premolars. FNAC was avoided due to the patient's history of prolonged bleeding post-FNAC. Based on the clinical findings, a provisional diagnosis of an odontogenic cystic lesion involving the left maxillary sinus was made, with differential diagnoses including chronic sinusitis, retention pseudocyst, maxillary sinus mucocele, odontogenic cyst, adenomatoid odontogenic tumor (AOT), and ameloblastoma.

Following the clinical examination, the patient was referred for both hematologic and radiological investigations. An Orthopantomogram (OPG; FIG 3), and Contrast Enhanced Computed Tomography (CECT; FIG 4a, 4b, 4c) were performed. These imaging studies revealed a well-defined radiolucency in the left maxilla and maxillary sinus, extending from the midline to the maxillary third molar region. The borders of the pathology were well-defined and non-corticated, and the internal structure was entirely radiolucent. Perforation and resorption of the buccal and palatal cortical plates were noted on the left side of the maxillary alveolus. The anterior aspect of the pathology involved the nasal floor on the left side, while the superior aspect of the lesion approached the floor of the orbit. Multiple root stumps were observed in the affected region, with a periapical radiolucency associated with the maxillary left canine merging into the lesion.

Given the patient's thrombocytopenic status, further blood investigations were conducted, revealing a reduced platelet count of 40,000. The patient was promptly referred to the Department of General Medicine for thrombocytopenia management. He underwent a bone marrow biopsy that did not reveal any significant

finding. The patient was then administered Vitamin K injections. Once the platelet count reached 80,000, deemed acceptable for surgical intervention, the lesion was enucleated.

### **Surgical Intervention**

During the enucleation procedure, the root stumps were left in situ because their removal would have led to uncontrolled blood ooze from the extraction sockets and the placement of the pack would have been difficult due to the resulting oroantral communications. Despite careful planning and intervention, post-operatively, bleeding occurred as anticipated. However, this was effectively managed using tranexamic acid injections (500mg/5ml, slow IV infusion) and local measures of hemorrhage control. The surgical team had prepared for such complications, ensuring timely and successful management. The status of the root stumps was observed in subsequent follow ups.

### **Histopathological examination**

Histopathological examination of the enucleated lesion revealed that it was lined focally by stratified squamous epithelium along with pseudo ciliated columnar epithelium . The wall of the cyst showed inflammatory granulation tissue and fibrosis, with normal bone trabeculae suggestive of a radicular cyst involving the left maxillary sinus. (FIG 5a, 5b)

### **Discussion**

Radicular cysts that extend into the maxillary sinus are relatively rare but have been documented in the literature. The expansion of a radicular cyst into the maxillary sinus can lead to a range of symptoms, including facial swelling, pain, nasal obstruction, and sinusitis-like symptoms, as seen in this case.<sup>2,5</sup>

For instance, Chkoura A. et al (2013) emphasized the need to carefully differentiate between a lesion originating from the maxillary sinus and those from the maxilla, and the importance of comprehensive imaging studies, including panoramic radiography and computed tomography (CT), to accurately assess the extent of the lesion and its proximity with adjacent anatomical structures. In our case, the use of CBCT was crucial in delineating the extent of the cystic lesion, which extended from the midline to the maxillary third molar region and involved perforation and resorption of the buccal and palatal cortical plates.<sup>7</sup> Managing a radicular cyst in a thrombocytopenic patient introduces additional complexity. Henderson et al. (2001) discussed the management of oral surgical procedures in patients with thrombocytopenia, recommending a target platelet count of at least 50,000/ $\mu$ L for minor procedures and 75,000-100,000/ $\mu$ L for major surgeries. In our case, surgery was deferred until the patient's platelet count reached 80,000/ $\mu$ L, which was considered safe for the enucleation of the cyst.<sup>8</sup>

The surgical approach in this case was also conservatively planned to minimize the risk of complications. The multidisciplinary approach taken in this case, involving close collaboration between oral medicine, radiology, oral surgery and general medicine departments, highlights the importance of integrated care in managing complex maxillofacial lesions.

### **Conclusion**

This case highlights the critical role of oral physicians and maxillofacial radiologists in managing complex

maxillofacial lesions in patients with systemic hematologic disorders. Through careful planning, intervention, and interdisciplinary collaboration, successful management of such cases can be achieved, minimizing risks and ensuring optimal patient outcomes.

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## FIGURES



**FIG 1**

**FIG 2**





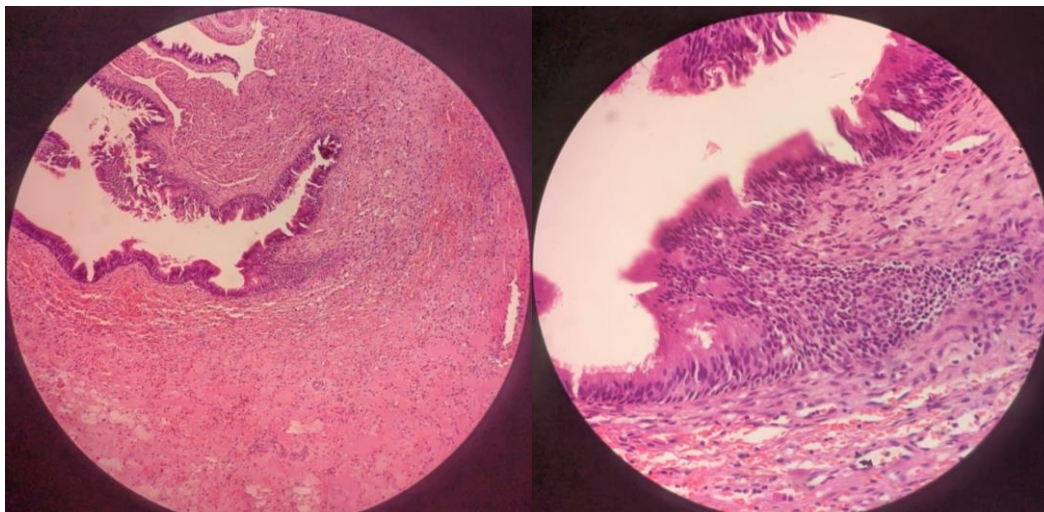
**FIG 3**



**FIG 4a**

**FIG 4b**

**FIG 4c**



**FIG 5a**

**FIG 5b**