CASE REPORT

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Suspect residual cyst at maxilla with sinus maxilaris involvement

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ABSTRACT

Objectives: This case report aims to describe the radiographic characteristics of residual cysts in the maxilla that extend into the vestibular area and the maxillary sinus, using panoramic and CBCT radiographs.

Case Report: An 81-year-old patient presented with a chief complaint of re-swelling after cyst removal under local anesthesia and scraping in 2022. The patient changed doctors and had a CBCT examination as a supporting examination to confirm the diagnosis. The patient had a history of hypertension and cholesterol, so treatment was delayed until now. Clinical examination showed vestibular swelling around the edentulous sites of teeth #13 and 14. Radiological examination showed a well-demarcated and well-defined radiolucency in the maxilla that was aggressive due to its relatively large size, erosion of the buccal cortical bone, and extension into the maxillary sinus. The suspected diagnosis of this case was a residual cyst due to previous treatment, with differential diagnoses of labial cyst, nasopalatine cyst, and radicular cyst.

Conclusion: Based on clinical examination, radiography examination by 2D, panoramic, and 3D CBCT, this lesion is radiolucent, leading to a suspected radiodiagnosis of maxillary residual ar cyst with maxillary sinus involvement.

Keywords: *CBCT, residual cyst, panoramic, maxillary sinus*
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INTRODUCTION

Jaw cysts can generally be classified by the presence or absence of epithelium lining the cyst, such as epithelial cysts and non-epithelial cysts. Epithelial cysts are divided into developmental cysts and inflammatory cysts. Developmental cysts are of two types: odontogenic and non-odontogenic cysts. The most common cysts are odontogenic cysts, where odontogenic means the source of the infection is the tooth. In a study of 526 cysts studied in Turkey, 509 or 96.8% were odontogenic cysts. Cysts of odontogenic origin are the most common type of cyst found in the epithelium of the developing tooth. The epithelium of these cysts can arise from the dental organ, Malassez remnants, reduced dental epithelium, and fragments of the dental lamina. These epithelial remnants may lead to the development of residual cysts after extraction of the problem tooth.[1–5]

According to White and Pharoah, there are several types of odontogenic cysts, such as radicular cyst, dentigerous cyst, buccal bifurcation cyst, odontogenic keratocyst tumour, lateral periodontal cyst, calcifying odontogenic cyst, residual cyst, and others. Residual cysts are odontogenic cysts whose main source is inflammation. Residual cysts are a variant of radicular (periapical) cysts that persist in the jawbone after extraction of a tooth with a pre-existing periapical cyst, which may have developed from a chronic periapical granuloma. Residual cysts are common in the jaw. They are usually more common in the maxilla than the mandible and are more common in men than women. A panoramic radiograph taken will usually show a well-demarcated, well-defined radiolucent lesion with an oval or round shape and unilocular.[1,2,6–8]

Cysts that occur in the maxillary region may extend to vital structures such as the maxillary sinus. Panoramic radiographs are two-dimensional radiographs that are usually superimposed, causing doubts in determining radiodiagnosis. The use of CBCT with three-dimensional images will provide more accurate and detailed images and can help in establishing suspected radiodiagnosis.[9–11]

This case report aims to describe the radiographic characteristics of residual cysts in the maxilla that extend into the vestibular area and maxillary sinus using panoramic radiographs and CBCT radiographs.

CASE REPORT

An 81-year-old female patient came to UNPAD RSGM, referred by Utama Elim clinic, for CBCT-3D examination. The patient had previously undergone

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a panoramic examination. The patient complained of swelling in the maxillary buccal area for several months. The complaint was swollen but painless. Clinical examination revealed a 2x2.5cm swelling on the buccal vestibule of the dextra maxilla. The palate mucosa appeared normal. The patient did not complain of any change in facial symmetry (Figures 1 and 2).

Figure 1. Extraoral examination

Figure 2. Intraoral examination

There was no history of fever, but the patient had a history of hypertension and cholesterol. The panoramic radiograph showed a well-defined, corticated radiolucent lesion in the canine region of the maxillary premolar (Figure 3). CBCT examination was performed using Vatech Picasso Trio 3D Dental Imaging to see the expansion of the lesion and a more specific image of the lesion on CBCT examination (Figure 4).

On CBCT images in the coronal view, there is a clear and firm border radiolucent lesion in the maxilla dextra extending to the anterior vestibule and maxillary sinus and destructing the maxillary sinus floor. The lesion area is 573.3 mm2, and the average density of the lesion is 3.2 grayscale, and the average density in the maxillary sinus is 119 grayscale. Sagittal view shows a well-defined and well-demarcated radiolucent lesion in the dextra maxilla extending to the anterior vestibule and maxillary sinus and destructing the base of the maxillary sinus. The lesion area is 619.08 mm2, and the average lesion density is -41.5 grayscale. Axial view shows a well-defined and well- demarcated radiolucent lesion in the dextra maxilla extending to the anterior vestibule and maxillary sinus. The lesion area is 158.45 mm2, and the average density of the lesion in the anterior vestibule is -164.3 grayscale, the average density in the mid maxilla is 29.8 grayscale, and the average density in the posterior maxilla is -139.1 grayscale.

It is known that the patient has returned to Madiun, but information from the patient's son-in-law is that the patient was not given any treatment after CBCT, nor was he given any medication. The patient's data is all in Madiun, but there is no access to request the data because the patient lives alone in Madiun. The data we got is still in the category of suspected radiodiagnosis.

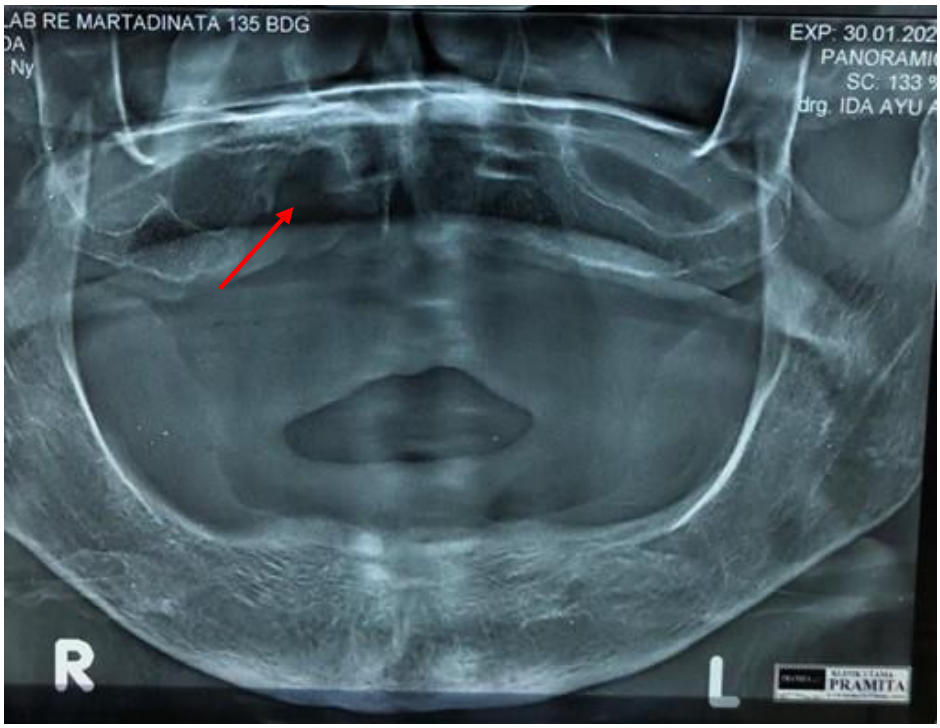

Figure 3. Panoramic view. Showing a well-defined round-shaped radiolucency in region 13-14

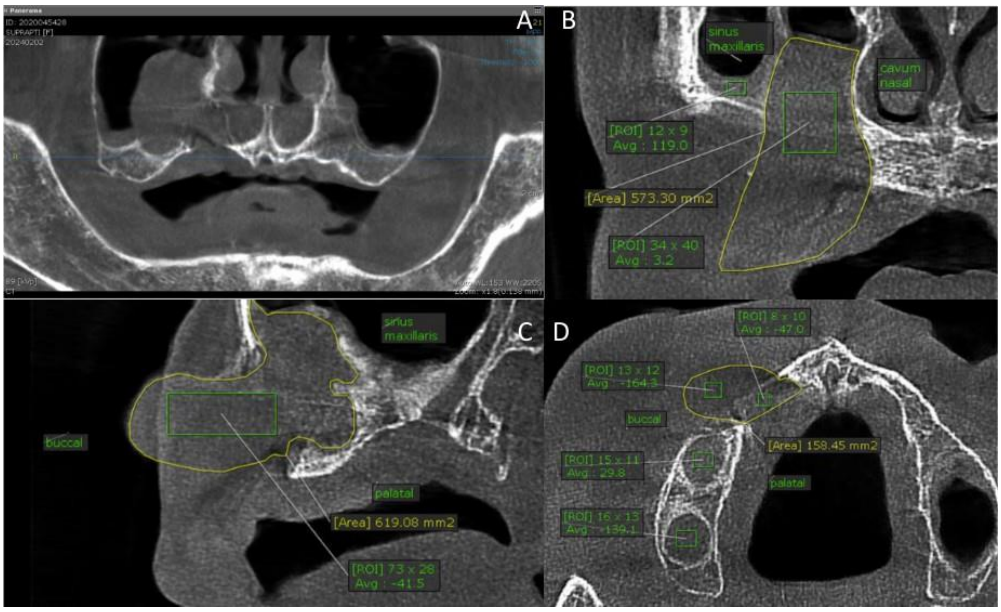

Figure 4. A. Panorama view. B. Coronal view C. Sagittal view. D. Axial View

DISCUSSION

Residual cysts are inflammatory cysts that occur in the jaw of odontogenic origin. Inflammatory cysts are a common type of cyst in the jaws. This group of cysts consists of radicular cysts and residual cysts, with residual cysts being the second most common cyst. The incidence of residual cysts has been reported to be about 10% of odontogenic cysts in the jaw and ranges from 2.2% - 13.7% depending on the region. These cysts are usually preceded by radicular cysts that develop apically or adjacent to carious teeth. Residual cysts present with clinical and radiographic similarities to radicular cysts; however, in the absence of a causative tooth, they can mimic more aggressive cysts and tumours seen on radiographs. In addition, these cysts have the ability to destroy bone within the jaw without symptoms. According to Lipa et al's study, cysts are most commonly found in the maxilla at about 85% or 23 out of 27 cases they studied, and usually occur in males. In Fadi and Jean's study, their residual cyst cases occurred in edentulous patients, were asymptomatic, and were seen accidentally during panoramic radiograph examination.[1,2,8,9]

Panoramic radiographs have been the primary screening tool for detecting large jaw lesions, including cysts, because they provide a broad overview of the maxillofacial region with relatively low radiation exposure and are readily available in dental clinics. However, Panoramic is inherently two-dimensional, which results in the

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superimposition of anatomical structures and geometric distortion, particularly in the anterior maxilla and regions where complex anatomy exists, limiting accurate assessment of lesion boundaries, cortical expansion, and proximity to adjacent vital structures. These limitations can reduce diagnostic confidence and accuracy for lesion characterization, differential diagnosis, and surgical planning. CBCT, on the other hand, provides true three-dimensional volumetric data that enable clinicians to evaluate lesions in all planes (axial, coronal, sagittal), determine the exact size, extent of cortical expansion, internal structure, and relationship to nearby anatomical landmarks (e.g., mandibular canal, sinus floor) much more reliably than Panoramic. Several studies have demonstrated that CBCT improves the visualization of intraosseous jaw lesions and increases diagnostic confidence and accuracy, especially in the anterior jaws and maxilla, where Panoramic is least reliable. CBCT is therefore extremely useful in planning surgical approaches and avoiding intraoperative complications, despite its relatively higher radiation dose than Panoramic, which should be justified according to the ALARA (As Low As Reasonably Achievable) principle.[5,9,12–16]

In the specific context of residual cysts, the diagnostic confidence arises not only from imaging but also from a combination of clinical history (such as a lesion at the site of a previously extracted infected tooth) and radiographic features. Residual cysts are inflammatory odontogenic cysts of radicular origin that remain after extraction of the offending tooth and, radiographically, often appear as well-defined unilocular radiolucencies in edentulous ridges or previous extraction sites. These features, along with the absence of an associated tooth, help differentiate residual cysts from other odontogenic cysts and tumors (e.g., dentigerous cysts, which are associated with impacted teeth; odontogenic keratocysts and ameloblastomas that may show more multilocular or aggressive features), but definitive diagnosis still requires histopathological confirmation. Compared with other lesions, residual cysts typically show smooth, corticated margins and slow expansion without early cortical perforation, though these characteristics can occasionally mimic more aggressive pathology, reinforcing the need for 3D imaging and biopsy correlation.[2,17,18]

In this case, both radiographs showed a unilocular lesion with well-demarcated and well-defined radiolucent contents in the dextra maxilla extending to the anterior vestibule and maxillary sinus and destructing the maxillary sinus floor. Residual cysts located in the edentulous area may cause expansion or extend to the alveolar ridge area, making denture use difficult due to the expansion of the resulting bone lesion. These cysts may also cause significant bone resorption and displacement of vital areas such as the inferior alveolar canal, maxillary antrum, and nasal cavity. The differential diagnosis of residual cysts includes unicystic ameloblastoma, odontogenic keratocyst (OKC), traumatic bone cyst, glandular odontogenic cyst (GOC), and lateral periodontal cyst.[6,17–21]

The following case report only describes a lesion seen from clinical examination and panoramic radiographs and CBCT, but has not been supported by the histopathological picture, so the data that researchers have is only a suspected or still a suspected diagnosis of residual cysts based on anamnesis, clinical examination, and radiographic examination.

CONCLUSION

Based on clinical examination, assisted by 2D, panoramic, and 3D CBCT radiographs, this radiolucent picture leads to a suspected or presumptive radiodiagnosis of residual cysts in the maxillary region with maxillary sinus involvement. In this study, there are several limitations that require suggestions to improve future studies. Researchers who find cases like the case above need histopathological examination to strengthen the diagnosis. Anamnesis, clinical examination, radiography, and histopathology that the doctor has from patient data, and the dentist's level of knowledge will support the accuracy of the diagnosis.

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FOOTNOTES

All authors have no potential conflict of interest to declare for this article.

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