CASE REPORT

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Dentigerous cyst associated with impaction of right maxillary third molar on panoramic radiograph and CBCT: a case report

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ABSTRACT

Objectives: The aim of this case report is to description of a dentigerous cyst associated with impaction of right maxillary third molar on panoramic radiographs and cone-beam computed tomography (CBCT).

Case Report: A 61-year-old male patient came to the Radiology Installation of RSGM Saraswati Denpasar to do perform a panoramic radiograph examination of tooth 15 which had cavities, pain and swelling of the upper right cheek. The results of panoramic radiograph examination showed tooth 15 had caries reaching the pulp and there was a radiolucent lesion at the apikal tooth 15, there was a radiolucent lesion from the mesio-distal CEJ on the crown of the maxillary right third molar that had not erupted, the borders were well-defined, corticated, unilocular, involving the apical of teeth 15,16 and 17. A few days later the patient came back to do CBCT to see more clearly the boundaries, diameter of the lesion and see the relationship of the lesion with surrounding structure.

Conclusion: Panoramic radiography and CBCT can be used as a supporting examination in making a diagnosis. The dentigerous cyst associated with impacted right maxillary third molar is clearly visible on the panoramic radiograph and CBCT so that it can assist in planning the appropriate treatment for the patient.

Keywords: *Dentigerous cyst, impacted third molar, panoramic, cone-beam computed tomography*
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INTRODUCTION

A dentigerous cyst (follicular cyst) is an odontogenic cyst that forms around the crown of an unerupted tooth. There are usually no symptoms associated with a dentigerous cyst unless there is infection, visible swelling and pain. Approximately 70% of dentigerous cysts occur in the mandible and 30% in the maxilla. The location of dentigerous cysts is usually found in mandibular third molars, maxillary canines, mandibular second premolars and maxillary third molars. [1,2,3,4,5]

Dentigerous cysts are the most common type of cyst in the mandible. The development of odontogenic cysts accounts for about 14%-24% of all epithelial cysts in the jaws. The normal follicular space in a dentigerous cyst is 3-4 mm. If the follicular space on the impaction tooth is more than 5 m, then it can be suspected as a dentigerous cyst. This cyst covers the crown of an unerupted tooth and is attached to the cementoenamel junction. [6,2] When the cyst is smaller, it is difficult to distinguish a dentigerous cyst from a large dental follicle. A dentigerous cyst exists when the distance between the crown and the dental follicle is greater than 2.5 – 3.0 mm.[7]

The condition of a tooth that cannot erupt beyond the arch during tooth eruption is called an impaction tooth. Abnormalities of tooth growth and development, bone layer density, soft tissue thickness, chronic infection, and lack of space are the causes of impaction teeth.[8] Delayed tooth eruption can cause accumulation of fluid in the reduced enamel epithelial layer or between the epithelium and crowns of teeth that are reduced causing the formation of dentigerous cysts common factors that cause impaction teeth are trauma, infection and abnormal tooth development. [9]

Cysts may be discovered during routine radiographic examinations. Conventional imaging modalities such as panoramic and periapical radiographs are commonly used imaging modalities and have some limitations, namely 3-dimensional anatomical structures are displayed in 2-dimensional form, so that superimposition.[10] Cone Beam Computed Tomography (CBCT) is very important in helping to establish the diagnosis and identify the location, boundaries and shape, internal structure, effects on the tissues surrounding the lesion. The main advantage of CBCT is that it provides multiplanar reform with volume reconstruction and 3D images at a much lower radiation dose when compared to computed tomography.[11]

The aim of this case report is to description of a dentigerous cyst associated with impaction of right

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maxillary third molar on panoramic radiographs and CBCT.

CASE REPORT

A 61-year-old male patient came to the Radiology Installation of RSGM Saraswati Denpasar to perform a panoramic radiograph examination of the second premolar with cavities, pain and swelling on the right maxillary cheek. The results of panoramic radiographs showed that caries reached the pulp of the second premolar and there was a radiolucent lesion apical to the second premolar. Then there was a radiolucent lesion of the mesio-distal CEJ on the immature right maxillary third molar crown, well defined, corticated, unilocular borders, involving the apical second premolars, first and second molars (Figure 1). A few days later the patient came back for a CBCT examination to see more clearly the boundaries, diameter of the lesion and see the relationship between the lesion and its surroundings.

The coronal view (Figure 3) shows the extent and diameter of the lesion involving the apical second premolar, first molar and right maxillary second molar. The coronal view shows a radiolucency, well defined borders, round shape, unilocular, lesion diameter 19.7 x 17.4 mm with an area of 244.50 mm^2, the lesion involves the apical aspect of the right maxillary first molar. The sagittal view (Figure 4A) shows the lesion extending into the right maxillary sinus and in a buccal direction. The axial view (Figure 4B and 4C) shows the lesion

Figure 1. Panoramic radiograph of the patient

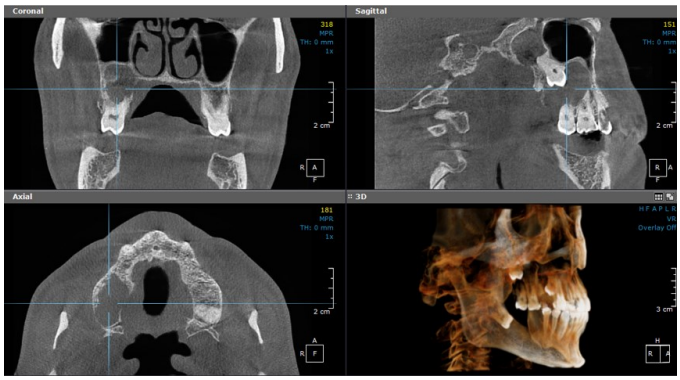

Figure 2. CBCT multiplanar view shows coronal, sagittal, axial and 3D views of the right maxillary third molar

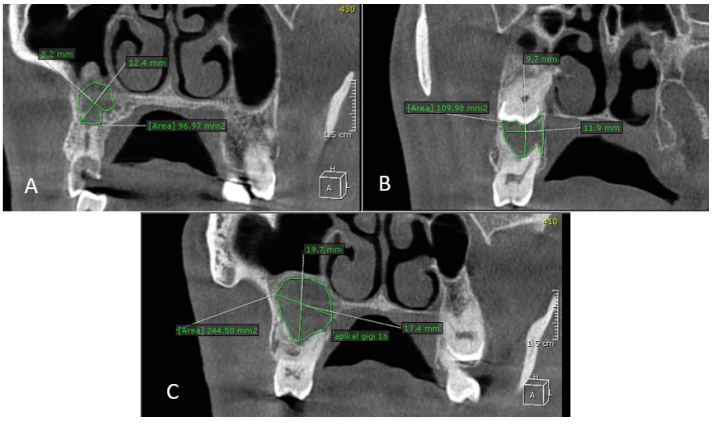

Figure 3. CBCT coronal view showing the right maxillary third molar has a radiolucent image, well defined border, surrounding the crown of the right maxillary third molar to the apical of the (A) right maxillary second premolar, (B) first molar and (C) second molar

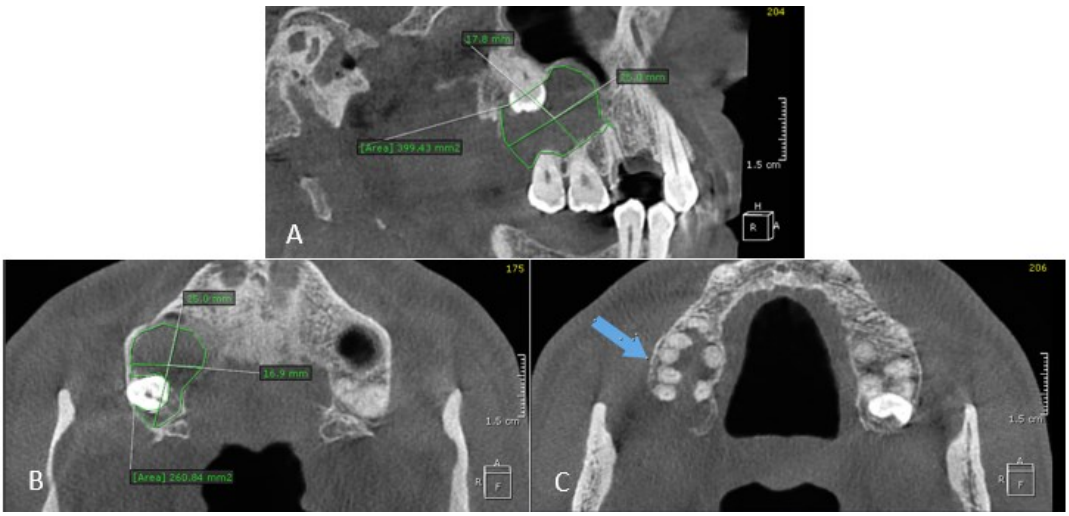

Figure 4. CBCT (A) sagittal view, (B) and (C) axial view of the lesion surrounding the crown of the right maxillary third molar

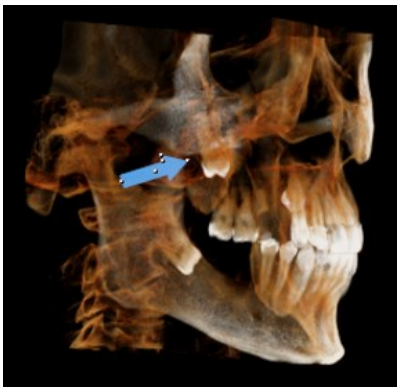

Figure 5. CBCT 3D image of the right maxillary third molar

surrounding the tooth and the lesion involving the apical second premolar, first molar and right maxillary second molar. The radiodiagnosis in the above case was impaction in the vertical type C position with dentigerous cyst on the right maxillary third molar.

DISCUSSION

Dentigerous cysts are small asymptomatic lesions found on radiographs, although some may grow to a size large enough to cause bony expansion which is usually not felt until secondary infection occurs. It is highly variable in size, often occurring in maxillary and mandibular third molars, maxillary canines and mandibular second premolars. These cysts usually occur in adolescents or young adults 20-40 years.[2,3,12]

Clinically, dentigerous cysts are generally asymptomatic, the swelling grows slowly, and there are unerupted teeth. As the cyst enlarges it can cause expansion and swelling of the jaw. This can occur when the cyst invades the maxillary antrum. Failure to intervene can result in encroachment of the cyst into the nasal septum, orbit, can cause chronic maxillary sinusitis or malignant transformation, but this is very rare.[11]

The epicenter of a dentigerous cyst is found over the crown of the associated tooth, most commonly in the mandibular or maxillary third molars and maxillary canines. This cyst is attached to the cemento enamel junction. Well defined boundaries, the internal structure is radiolucent, the effect on the surrounding tissue displacement and resorption of adjacent teeth.[1,6] Cyst growth is slow and regular, making dentigerous cysts have clear sclerotic borders, with a clear cortex, and characterized by a radiopaque border thin, especially if the size of the cyst is relatively large or if there is a shift.[4]

This case shows that the patient complains of pain and swelling occurs, the cyst is on the impacted tooth of the maxillary right third molar which has not yet grown, the location of the cyst in this case is attached to the cemento enamel junction. It appears that the cyst is enlarged causing expansion in the right maxillary sinus and towards the buccal. It appears that the cyst extends to the apical second premolar, first molar and right maxillary second molar. It can be seen that the roots of the second premolar, first molar and second molar of the right maxillary tooth did not shift and root resorbed.

Radiographic examination is important for diagnosing and planning treatment in cases of dentigerous cysts. Panoramic radiograph is an imaging modality that is often used to make a

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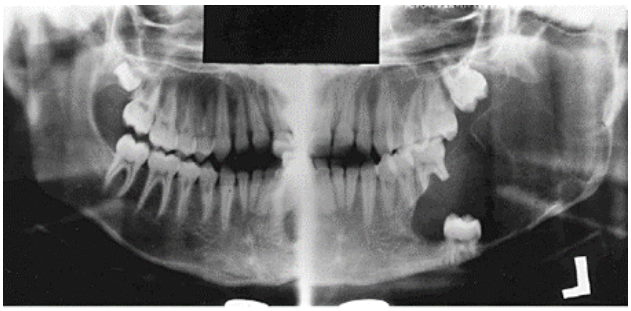

Figure 6. Unicystic ameloblastoma progressing from the occlusal to the left mandibular second molar causing the body of the mandible and ramus to the sigmoid notch and neck of the condyle as well as the root of the left first molar resorption and displacement of the second molar[1]

diagnosis, in this case the impaction teeth in the maxilla are clearly visible, but the lesion boundaries are not clearly visible and the relationship of the lesion with the teeth involved is not very clear. This is because the anatomical structures in the maxilla are often superimposed.

CBCT represents the most significant technological advance in maxillofacial imaging since the introduction of panoramic radiography. It is used in the dental and maxillary areas and as the imaging modality of choice in certain clinical situations.[1,10] The advantage of using CBCT is that it can see the boundaries of the lesion in hard tissue and the lesion can be seen from various planes (axial, coronal, and sagittal).[13] CBCT very helpful in this case, the relationship of the lesion with the right maxillary sinus was seen and the teeth involved with the lesion were clearly visible.

The differential diagnosis of a dentigerous cyst, namely unicystic ameloblastoma located around the crown of an unerupted tooth, is unilocular in shape. Often occurs in young patients, 50% of these tumors are found in patients who are in the second decade. Unicystic ameloblastoma more than 90% is found in the maxilla and mandible, especially in the posterior region of the mandible. The unicystic ameloblastoma generally forms dentigerous cysts clinically and radiographically, although some of them are not associated with erupting teeth.[1,14]

Dentigerous cyst and unicystic ameloblastoma, radiographically the appearance of dentigerous cyst and ameloblastoma is very similar because there is a unilocular radiolucent appearance, resembling a dentigerous cyst. It is also located around teeth that have not yet erupted, and occurs at the age of under 30 years. The standard treatment for maxillary dentigerous cysts is enucleation and extraction of the associated teeth.[1]

CONCLUSION

Panoramic radiography and CBCT can be used as a supporting examination in making a diagnosis. The dentigerous cyst associated with impaction right maxillary third molar is clearly visible on the panoramic radiograph and CBCT so that it can assist in planning the appropriate treatment for the patient.

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None.

FOOTNOTES

All authors have no potential conflict of interest to declare for this article. Informed consent was obtained from the patient for being included in this case report.

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