



# Bilateral radicular cyst mimicking dentigerous cyst: a case report

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## ABSTRACT

**Objectives:** The aim of this case report is to describe radiographically the specific features of periapical cysts to differentiate them from dentigerous cyst lesions despite their similar clinical appearance.

**Case Report:** A 21-year-old female patient came to Dental Hospital in Bandung with a referral for a cone-beam computed tomography (CBCT) examination with a clinical diagnosis of suspected right mandibular dentigerous cyst and left mandibular periapical cyst. The patient said that during the past month, swelling had appeared on both sides of the jaw, which was getting bigger, the pain was intermittent, and it was disturbing when eating. Intraoral examination showed gingival enlargement, mucuccubal fold disappeared.

Extraoral examination, facial asymmetry was found due to unilateral swelling. Radiographic examinations showed both lesions were oval, unilocular, radiolucent internal structures with an average density of 4.7-32 HU resembling soft tissue density, corticated or radiopaque borders, caused expansion of the mandibular corpus buccally and lingually and to mesial and distal, cortical thinning and displacement of the inferior mandibular canal.

**Conclusion:** Lesions on the jaws have almost the same clinical appearance, but through CBCT examination the type of lesion can be well determined. Periapical cyst lesion with large size has a clinical appearance like dentigerous lesions, but radiographically will show a different specific picture.

**Keywords:** Dentigerous cyst, radicular cyst, cone-beam computed tomography

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## INTRODUCTION

Radicular cyst is an odontogenic cyst with the highest incidence of cases and can occur in all regions. The pathophysiological process begins with a stimulus to the residual disease epithelium around the periodontal ligament from non-vital inflammatory products of the tooth which then proliferates to form a pathological cavity known as a cyst.<sup>1</sup> Clinically, periapical cysts are quite variable, the size of the lesion can be enlarged to extra oral causing mis diagnoses with other odontogenic cysts, or even neoplasm.

Radiographically, radicular cyst appears as a well-defined round or oval unilocular radiolucency with radiopaque sclerotic margin in the periapical region of involved tooth, but in case of an infected cyst, the radiopaque margin disappears because of rapid growth of the cyst.<sup>2</sup> Cone beam computed tomography (CBCT) provides three-dimensional images of the object from sagittal, coronal, and axial direction, to overcome the defects of two-dimensional image, such as overlap and deformation.<sup>3</sup> Currently, CBCT has been utilized in the place of periapical radiographs as a non-surgical method for differentiating periapical lesion. The aim

of this case report is to describe radiographically the specific features of periapical cysts to differentiate them from dentigerous cyst lesions despite their similar clinical appearance.

## CASE REPORT

A 21-year-old female patient reported to the Radiology in Dental Hospital Bandung with a referral for a CBCT examination with a clinical diagnosis of suspected right dentigerous cyst and left mandibular periapical cyst. The patient said that during the past month, swelling had appeared on both sides of the jaw. Swelling was small initially, which gradually increased to the present size. Swelling was associated with pain, intermittent, and it was disturbing when eating. On examination, extraorally diffuse swelling in the right mandibular region and facial asymmetry was found due to unilateral swelling (Figure 1a). The swelling was a tender on palpation, hard in consistency. Intraorally swelling in the area buccal vestibulum (tooth number 45-47) (Figure 2a) with buccal expansion,

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remaining roots (tooth number 36 and 46) (Figure 2b).

The Orthopantomograph® OP300 Maxio unit (instrumentarium Dental, PaloDEX, Group Oy, Tuusula, Finland) was used for the CBCT scans, and the following acquisition parameters were used: FOV 8x15 cm and high resolution. OnDemand3D Dental v1.0 Build 1.0.10.7462 was used to analyze and recreate the pictures (Cybermed Inc, Daejeon, Republic of Korea). Radiographic examinations showed both lesions were oval, unilocular, radiolucent internal structures with an average density 4.7 HU for posterior right mandibula lesion (Figure 3) and -32 HU for posterior left mandibula (Figure 4) resembling soft tissue density, corticated

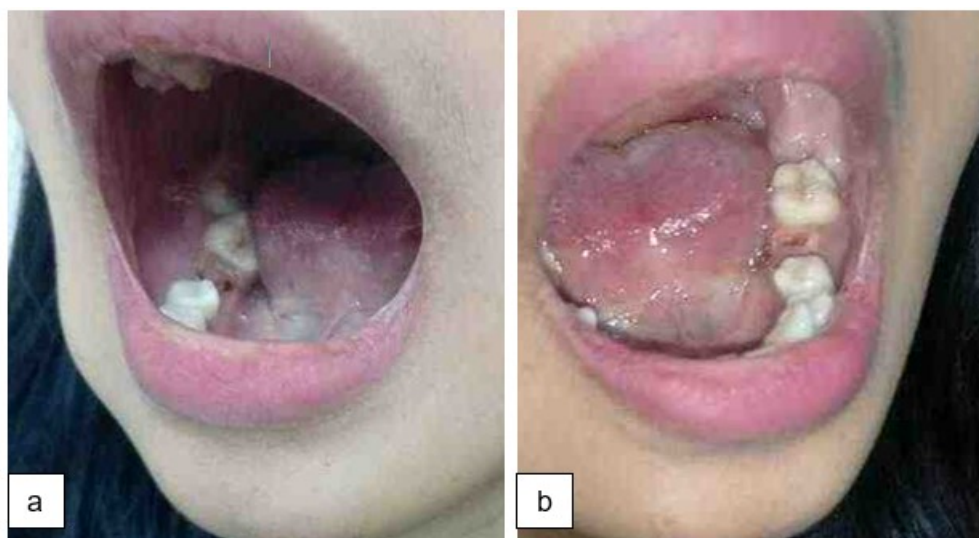
or radiopaque borders, caused expansion of the mandibular corpus buccally and lingually and to mesial and distal, cortical thinning and displacement of the inferior mandibular canal (Figure 5). Both masses of tooth bearing lesions with suspected etiology of root gangrene 36, 46, led to a radiodiagnosis of periapical cyst.

## DISCUSSION

Radicular cyst also known as radicular cyst, root end cyst, or dental cyst, is an odontogenic cyst with the highest incidence of cases and can occur in all



**Figure 1.** Patient's profile: (a) Frontal view showed swelling of the right mandibular region and facial asymmetry; (b) lateral view.



**Figure 2.** Intraoral assessment: (a) Swelling in the posterior right mandibular region; and (b) swelling in the posterior left mandibular region with remaining tooth.

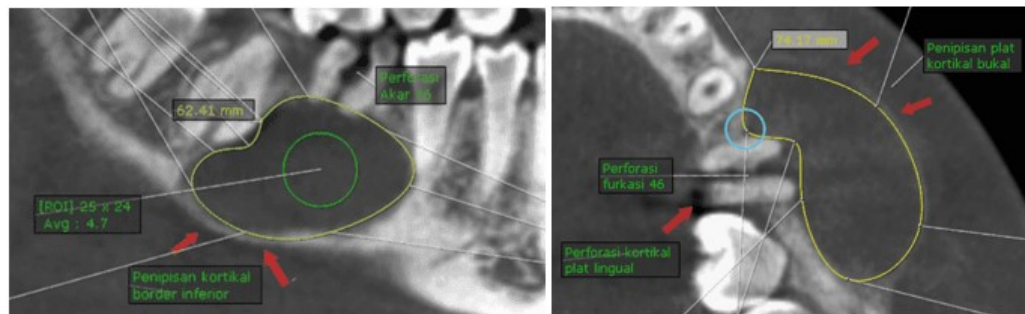


Figure 3. Cone-beam computed tomography showing radicular cyst of 46 from sagittal and axial view

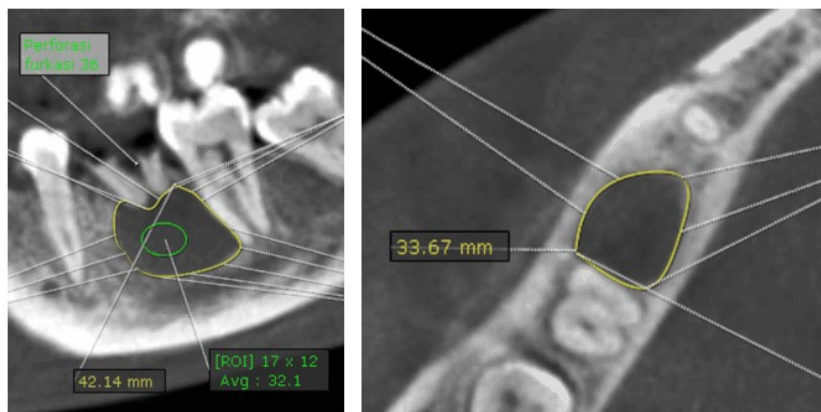


Figure 4. Cone-beam computed tomography showing radicular cyst of 36 from sagittal and axial view

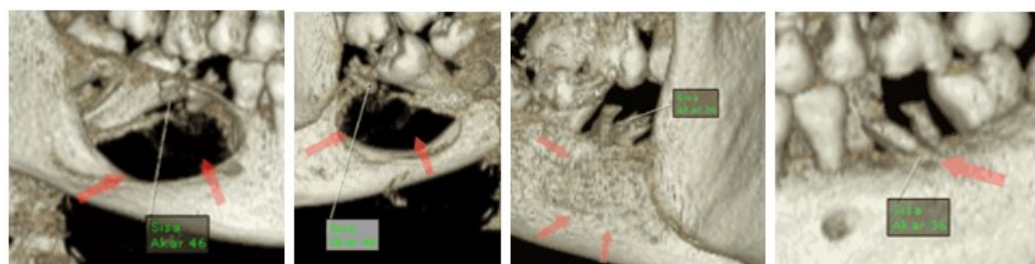


Figure 5. Cone-beam computed tomography showing radicular cyst of 36 and 46 in 3D view

regions about 52%-68% of all the incidences which affect the jaw.<sup>4</sup> The origin of radicular cyst is from epithelial rests of Malassez involved during the evolution of periapical granulomas, characterized by an inflammatory process associated with the central cavity formation and limited by the stratified squamous epithelium, which may be discontinuous.<sup>5</sup> Commonly, cyst is associated with carious, nonvital, discolored, or fractured tooth or teeth.<sup>2</sup> Usually, radicular cysts are painless until and unless they are infected. The expansion of buccal and lingual cortical plate may be evident in severe cases.<sup>5</sup> The progression of the lesion is determined not only by the individual's immunological level and local predisposing variables, but also by the disease's duration, which could be one of the reasons for the massive growth in size over time.<sup>6</sup>

Radicular cyst occurs more commonly between the third and fifth decades, with male predilection, and is more frequently found in the anterior maxilla relative to other parts of the oral cavity.<sup>7</sup> Male to female ratio in the periapical cyst is 1.6:1. In this

case, patient's age, sex, size of the cyst, and its bilateral presentation in the mandibular posterior region is considered rare.<sup>4,8</sup>

The pathogenesis of radicular cysts comprises three distinct phases: the phase of initiation, the phase of cyst formation, and the phase of enlargement. The teeth associated with the cyst are always nonvital and may be discolored too. It is clinically exhibited as buccal or palatal swelling in the maxilla and buccal in the mandible.<sup>4</sup> Initially, it tends to be a bony hard enlargement, but as the cyst develops in size, the bone gets resorbed and becomes thin, and a characteristic eggshell crackling is perceived on the swelling. The concomitant teeth are permanently non-vital and could express discoloration. Associated root typically display no root resorption; there may be even resorption of root apices.<sup>9</sup> Cyst is assumed to be produced by multiplying of the epithelial cell rest of Malassez in inflamed peri radicular tissues. Nearly all radicular cysts are lined completely or in the fragment by non-keratinized stratified

squamous epithelium. The inflammatory cell penetrates in the thriving epithelial linings comprising largely of polymorphonuclear leukocytes. Whereas adjoining fibrous capsule is penetrated principally by enduring inflammatory cells.<sup>9</sup> Its quite unusual to see this lesion in a bilaterally mandible, as we seen in our case.

The use of CBCT preoperatively helped to determine the extent of the cyst and plan the surgery better than conventional radiography. The 3D imaging capabilities of cone beam computed tomography make it possible to see how the roots and root apices relate anatomically to other anatomical structures in any plane. Additionally, prior to beginning surgery, it should be possible to assess the cortical plate thickness, the cancellous bone pattern, fenestrations, the shape of the maxilla and mandible, as well as the inclination of the roots of the teeth intended for periapical surgery.<sup>10</sup> In this case, use of CBCT preoperatively helped in assessing the extent of the cyst and to plan the treatment.<sup>11</sup>

Radiographic changes of radicular cyst include well-defined radiolucency, expansion of cortical plates with thin reactive cortex. Cone-beam computed tomography revealed clearly defined radiolucency in the periapical regions of 36 and 46. Based on this case report, cone-beam computed tomography revealed osteolytic lesion with sclerotic margin in the periapical region of 36 and 46. Radiographic examination showed both lesions were oval, unilocular, radiolucent internal structures with an average density of 4.7-32 HU resembling soft tissue density, corticated or radiopaque borders, caused expansion of the mandibular corpus buccally and lingually and to mesial and distal, cortical thinning and displacement of the inferior mandibular canal. Both masses of tooth bearing lesions with suspected etiology of remaining roots (root gangrene) 36, 46 led to a radiodiagnosis of periapical cyst. Other odontogenic cysts such as dentigerous cyst may share similar radiological features. Dentigerous cysts are always associated with the crown of an unerupted, impacted tooth or dental anomaly such as odontoma or a supernumerary tooth, while in this case from the radiograph doesn't provide a radiographic appearance of a dentigerous cyst. CBCT images provide more accurate diagnosis than periapical radiographs. Gray values were also used to diagnose periapical lesions.<sup>12</sup>

## CONCLUSION

Lesions on the jaws have almost the same clinical appearance, but through CBCT examination the type of lesion can be well determined. Radicular cyst lesion with large size has a clinical appearance like dentigerous lesions, but radiographically will show a different specific picture.

## 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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