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ODONTOGENIC KERATOCYSTS IN CHILDREN AND ADULTS: A CLINICAL AND RADIOGRAPHIC PERSPECTIVE BASED ON TWO CASE REPORTS

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ABSTRACT

Background: The odontogenic keratocyst (OKC) is a type of odontogenic jaw cyst with a higher prevalence in the mandible. Radiographically, it may present as a unilocular or multilocular lesion, which is often challenging to identify and can lead to diagnostic difficulties. A distinctive feature of this lesion is its scalloped margins, growth pattern that follows the contour of bone and adjacent tissues, and its ability to cause root resorption of the affected teeth.
Case: Two cases with similar characteristics are described. The first case involved an 11-year-old female with swelling in the right mandible for the past eight months. The second case was a 32-year-old female presenting with swelling of the lower mandibular mucosa for six months. Both were diagnosed with OKC.
Conclusion: OKC exhibits notable differences in radiographic appearance between pediatric and adult patients. These differences can be observed in growth patterns, margin configuration, and minimal root resorption. Nevertheless, the recurrence rate remains high. Panoramic radiography is sufficient to display these distinguishing characteristics.

INTRODUCTION

The Odontogenic Keratocyst (OKC) is an intraosseous, odontogenic lesion classified as a benign, which may occur in unilocular or multilocular form, and is lined by parakeratinized stratified squamous epithelium. It possesses aggressive and infiltrative potential and shows a tendency for recurrence following surgical treatment.[1] Radiographically, OKC typically appears as a solitary lesion that grows along the bone, with smooth, regular, corticated borders. The most frequent location of OKC is in the posterior mandible, where it present as a unilocular or multilocular radiolucency.[2–5]

Odontogenic Keratocyst (OKC) account for approximately 1.7% of all jaw cysts, making OKC the third most common cyst in the jaw after radicular and dentigerous cysts.[1,2] They are recognized for their aggressive behavior and relatively high recurrence rates, with a marked predilection for the mandible, particularly the ramus region, more so than the maxilla.[2,3]

The average age of occurrence is 40 years, with a higher incidence in males.[4] In the present

report, however, an OKC was identified in a pediatric patient. The radiographic appearance of OKC in both cases shows notable similarities.[5] This paper aims to compare the radiographic characteristics of OKC in adult and pediatric patients.

CASE REPORT

Case 1

An 11-year-old female presented to the radiology unit of the Dental and Oral Hospital for a panoramic radiograph due to swelling on the lower right side of her face, which had persisted for eight months. She reported intermittent pain and paresthesia. Extraoral examination revealed facial asymmetry, with a smooth swelling in the affected region. Intraorally, there was an enlargement in the right posterior mandibular region with distinct borders; palpation indicated a firm consistency accompanied by occasional pain.

The panoramic radiograph (Figure 1) demonstrated a radiolucent lesion involving the right mandibular body and teeth 43–47, extending into the ascending ramus and the inferior mandibular border, measuring approximately 6 × 4 cm, and unilateral in nature. The lesion margins were well-defined and regular. Radiographic features included a scalloped outline, multiple internal septa, absence of root resorption, and no evidence of tooth displacement. The primary diagnosis was odontogenic keratocyst, with ameloblastoma considered in the differential diagnosis.

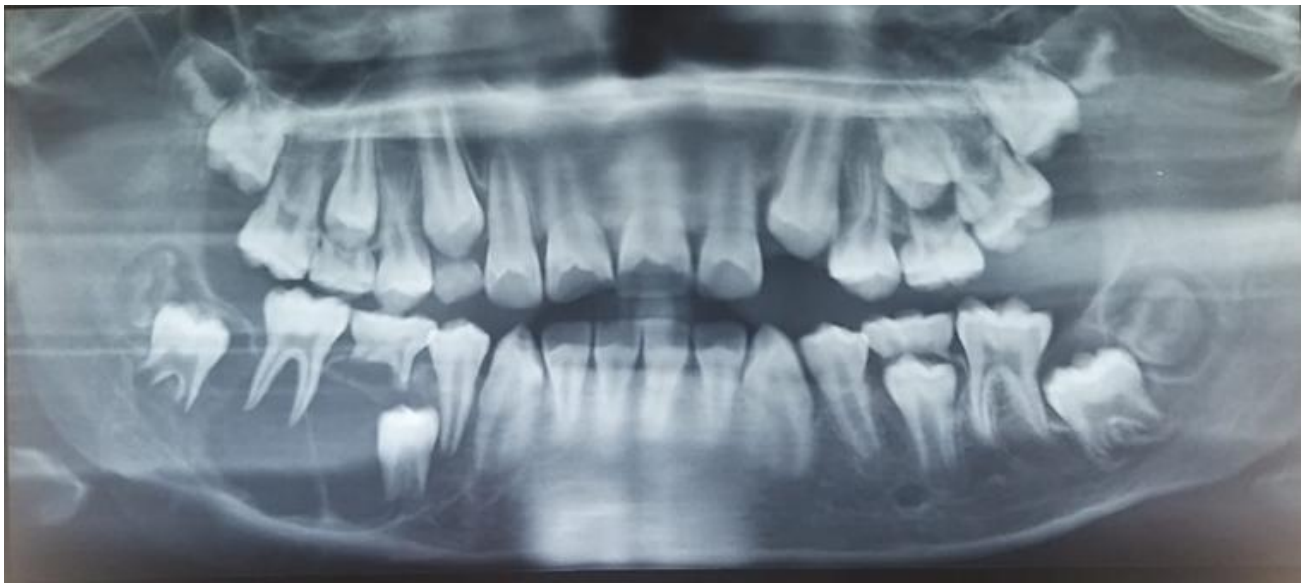

Figure 1. Panoramic radiograph of Case 1, lesion visible on the right side of the mandible. The lesion is quite large, covering the distal tooth 43 to the posterior mandible. (personal archive)[24]

Case 2

A 32-year-old female was referred for a panoramic radiograph due to swelling in the lower left posterior oral region for six months. No facial asymmetry or paresthesia was detected on extraoral examination. Intraorally, swelling was observed in the left posterior mandible, accompanied by intermittent pain.

Radiographic assessment (Figure 2) revealed a radiolucent lesion involving the mandibular body in the region of teeth 37–38, extending to the ascending ramus and the inferior mandibular border. The lesion measured approximately 3 × 4 cm and was unilateral. The internal structure was radiolucent with a distinct scalloped margin, presenting a unique appearance. The case was diagnosed as odontogenic keratocyst, with a dentigerous cyst included in the differential diagnosis.

Figure 2. Panoramic radiograph of a patient with OKC on the right mandible, with clear and distinct boundaries. (personal archive)[24]

In both cases, patients underwent panoramic imaging and were subsequently referred back to their dentists for further management; however, no additional follow-up data were available regarding treatment outcomes.

DISCUSSION

OKC was first identified in 1876 and officially named by Phillipsen in 1956. It is an odontogenic cyst characterized by a lining of keratinized stratified squamous epithelium.[6] In 1992, the World Health Organization (WHO) considered the term synonymous with "primordial cyst" to describe benign odontogenic cysts with specific histological features.[6] In 2005, OKC was reclassified as a benign odontogenic tumor—keratocystic odontogenic tumor (KCOT)—due to its aggressive nature and high recurrence rate. The third edition of the WHO classification also associated it with mutations in the *PTCH* tumor suppressor gene, which is linked to Gorlin–Goltz syndrome.[6-9] However, due to

insufficient supporting evidence, KCOT was reclassified back to the cyst category in later editions, where it remains.[10–12]

Clinically, OKCs are often solitary lesions, most frequently located at the mandibular angle, and are usually asymptomatic, being discovered incidentally on routine radiographs. Radiographically, they typically present as unilocular radiolucencies with well-defined borders. The high recurrence rate is attributed to incomplete removal of the cyst lining, which triggers the development of new cysts.[13] It has been reported that IL-1 and IL-6 synthesis by keratinocytes, along with increased prostaglandin levels, are factors contributing to the high recurrence rate associated with OKC.[14] The recurrence rate decreases with the completeness of treatment, as evidenced by the fact that after treatment, the recurrent parakeratinized epithelium histologically changes to nonkeratinized epithelium with reduced expression of Ki-67 and Bcl_2.[13]

Radiographically, OKC appears as a radiolucent lesion, unilocular or multilocular, with borders limited by cortical margins. Unilocular lesions are predominant, while the multilocular variant is observed in approximately 30% of cases, most commonly in the mandible.[15] On panoramic radiographs, unilocular OKC may occasionally appear with septa, resembling multicystic ameloblastoma or myxoma. Differential diagnoses for odontogenic keratocyst include ameloblastoma, periodontal cyst, radicular cyst, dentigerous cyst, and odontogenic myxoma.[16,17] This is similar to the case under discussion. In this case, there is a lesion with a radiolucent appearance with septa (Case 1), resembling the appearance of a myxoma or unicystic ameloblastoma (Case 2). Similarly, the appearance of the second case shows a radiolucent unicystic lesion. All lesions in the case have well-defined borders and are corticated.[18]

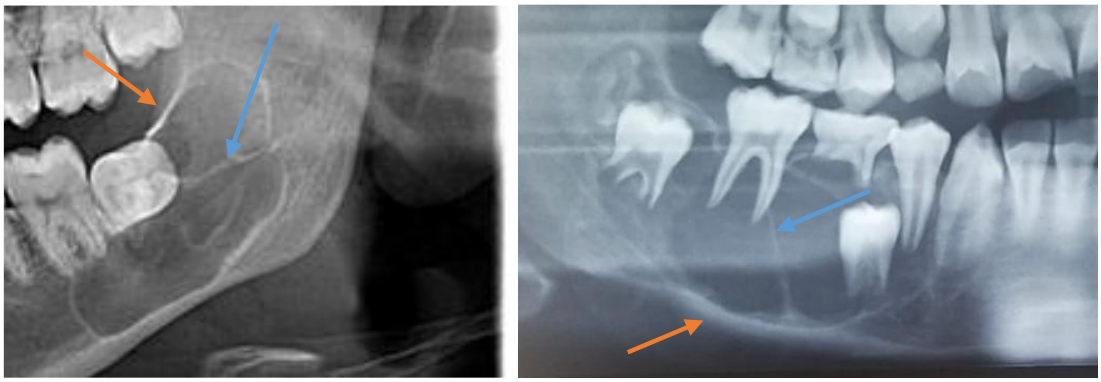

Figure 3. Shows differences in the shape of the lesions on both radiographs. The characteristics of the lesions are clearly visible at the border accompanied by true septa.[24]

In addition to the differences observed in radiographic appearance between the two cases, patient age may also influence the biological behavior and growth pattern of OKC. Studies have shown that OKCs in younger patients may exhibit a more rapid expansion and higher cellular activity, possibly due to developmental factors and greater bone remodeling potential in pediatric populations.

Conversely, adult cases often show more localized and contained lesions with a slower progression rate. These variations emphasize the importance of age-related considerations in radiographic interpretation and clinical management of OKC. Early diagnosis through panoramic imaging remains crucial in both age groups to minimize the extent of surgical intervention and reduce the risk of recurrence.[19, 20]

According to Alves (2018) in his report, he states that on radiographic appearance, ameloblastoma can expand the cortical bone of the mandible, whereas this is not found in OKC. Additionally, OKC is often presented as unilocular with septa, whereas ameloblastoma shows a multilocular pattern.[21,22] Odontogenic keratocysts are more commonly found in the body of the mandible compared to ameloblastoma, and ameloblastoma more frequently causes root resorption compared to odontogenic keratocysts.[22,23] Periodontal cysts can be distinguished from odontogenic keratocysts based on their expansion. Periodontal cysts closely resemble small odontogenic keratocysts, and if left untreated, odontogenic keratocysts tend to expand. Radicular cysts typically occur in teeth with non-vital pulp, whereas odontogenic keratocysts can occur in vital teeth. Dentigerous cysts tend to expand toward the bone and may cause root resorption, whereas odontogenic keratocysts do not expand toward the bone or cause root resorption, although to a lesser degree than dentigerous cysts.[25,26]

CONCLUSION

Basically, OKC has a very different appearance on radiographs. This difference is easily recognizable, especially in children and adults. This difference can be identified from the characteristics of the growth type, scalloped edges, and minimal root resorption. However, OKC has a high recurrence rate. Panoramic radiographs are sufficient to show all the necessary distinguishing characteristics.

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