ODONTOGENIC KERATOCYSTS: VARIOUS RADIOGRAPHIC APPEARANCES

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ABSTRACT

Odontogenic cysts are often encountered in dental practices. Many odontogenic cysts do not cause symptoms and, as a result, are only found during routine radiographic examination. They develop from dental lamina remnants in the mandible and maxilla. Odontogenic keratocyst (OKC) is of particular interest because of its high recurrence rate and aggressive behaviour. The OKC does not have a characteristic radiographic appearance that distinguishes it from other radiolucent lesions of the jaws. In this article various radiographic appearances are discussed which is important for the diagnosis of the lesion. Posterior mandible and ramus is usually affected. Patients complain of pain, swelling or discharge. Occasionally they experience paraesthesia of the lower lip or teeth.

Key words: Odontogenic cysts, Radiographic examination.

INTRODUCTION

Odontogenic Keratocyst (OKC) was first described by Philipsen in 1956. It is the cyst arising from the cell rests of dental lamina (Veena K M et al., 2011, Shear M, 2007, White CS and Pharaoh JM, 2004, Wood KN and Goaz WP, 1997). The odontogenic keratocyst (OKC, currently designated by the World Health Organization as a keratocystic odontogenic tumor) is a locally aggressive, cystic jaw lesion with a putative high growth potential and a propensity for recurrence. Although it is generally agreed that some features of OKCs are those of a neoplasia, notably the relatively high proliferative rate of epithelial cells, controversies over the behavior and management of OKCs still exist (Li TJ, 2011).

It is an epithelial developmental odontogenic cyst most commonly occurring in the jaws and the mandible is involved in 60 to 80% of cases with a marked tendency to occur in the posterior body and ascending ramus. Small cysts are usually asymptomatic but larger ones may show clinical manifestations like pain, swelling or drainage. They reach a large size particularly at the angle of mandible and ascending ramus before they are diagnosed (Kamtane S et al., 2011). Odontogenic keratocysts (OKCs) are one of the most frequent features of nevoid basal cell carcinoma syndrome (NBCCS). Neviod basal cell carcinoma syndrome (NBCCS) is associated with a triad of multiple basal nevi, multiple odontogenic keratocysts (OKCs) and skeletal abnormalities. This triad of symptoms may be associated with other manifestations involving skeletal, craniofacial, neurological, skin, sexual, ophthalmic and cardiac anomalies. Multiple OKCs have been known to occur in non-syndromic cases though it is very rare.

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These multiple lesions may be the first manifestation of the NBCCS or otherwise it may be because of the multifocal nature of OKCs (Bartake AR et al., 2011). The radiographic appearance of OKC may range from a small unilocular radiolucency to a large multilocular radiolucency. Hence it may resemble ameloblastoma, dentigerous cyst, lateral periodontal cyst and radicular cyst.

**Case report 1**

A 30 yr old male patient had come with a complaint of swelling in the lower right back region of jaw (Figure 1) since 2-3 days which had followed pain in the same region since 3-4 days which is intermittent and of moderate to severe intensity. Gradual increase in difficulty of mouth opening since 2 days. H/O fever since 1 day. H/O warm water gargling today morning with no relief. No H/O medication taken. H/O operculectomy done 4 months back. H/O sleep disturbance due to pain since 3 days. Gross facial asymmetry detected with diffuse swelling seen on right cheek region. Skin over swelling was normal. No ulcerations or pus discharge seen. There was local rise of temperature. Single, right submandibular lymph node was palpable, mobile and tender. Due to the limited mouth opening proper intraoral examination was not feasible. Pericoronal flap in relation to 48 was seen associated with pus discharge and was tender on palpation. Buccal and submandibular space infection due to pericoronal abscess 48.

Hence the provisional diagnosis of buccal and submandibular space infection was given. OPG showed well-defined unilocular radiolucency associated with 48 causing inferior displacement of the inferior alveolar canal and posterosuperior displacement of the impacted tooth. It also showed displacement of roots of adjacent teeth (Figure 2). Hence radiographic diagnosis of dentigerous cyst was given. It was enucleated and sent for biopsy where it turned out to be an odontogenic keratocyst.

**Case report 2.**

Another patient had come with the chief complaint of a swelling in the lower left back region of the face which was slightly tender and with associated pus discharge but no history of fever. On intraoral examination there was a single swelling present in mandibular left posterior buccal vestibule (Figure 3) extending from 35 to 37 causing buccal expansion and obliteration of buccal vestibule which was firm on palpation except for 2-3 areas where it was soft & fluctuant and tender on palpation. There was deep occlusal caries with 36 which was tender on palpation. There was a well-defined radiolucency associated with 38 with displacement of the tooth inferiorly seen on OPG radiograph (Figure 4). On aspiration a thick, yellow, cheesy material (evidence of cholesterol crystals). Hence the diagnosis of okc was given which was the same in the final biopsy report.
Case report 3
Another patient had come with a chief complaint of swelling of right side of her face which had been gradually enlarging since 6 months with no history of pain but she complained of paraesthesia. Intraoral examination revealed obliteration of buccal vestibule with no pus discharge (Figure 5) and non-tender on palpation. Swelling was firm in consistency and overlying mucosa was normal with no mobility of teeth. A provisional diagnosis of benign odontogenic tumour and on radiographic examination there was a large multilocular radiolucency (Figure 6) extending along the body of mandible crossing the midline and displacing the inferior alveolar canal after which the diagnosis of okc was given. It was enucleated and the final biopsy reported it to be an OKC.

Case report 4
This patient had come with a chief complaint of swelling in lower left region of jaw since one and half yr with no additional symptoms. Intraoral examination revealed a firm swelling in the left pterygomandibular region (Figure 7) with no pus discharge. It was non-tender on palpation and overlying mucosa was normal. There was no mobility of the mandibular molars. On radiographic examination a unilocular radiolucency (Figure 8) in the left body of the mandible apical to the molars was seen with root resorption. The diagnosis of ameloblastoma was given which was enucleated and on biopsy turned out to be OKC.

Case report 5
This patient had complained of a swelling in lower left region of jaw (Figure 9) since 12 yrs which had not increased in size since then. He complained of mild intermittent pain in the region associated with pus discharge since 7 days. On radiographic examination a unilocular radiolucent lesion (Figure 10) was seen in the left premolar region (Figure 9) involving the inferior alveolar canal. A provisional diagnosis of central giant cell granuloma was given based on the history and appearance of the lesion. It was enucleated and on biopsy turned out to be an OKC.
DISCUSSION

First described by Philipse in 1956, the odontogenic keratocyst (OKC) is now designated by the World Health Organization (WHO) as a keratocystic odontogenic tumour (KCOT) and is defined as “a benign uni- or multicystic, intraosseous tumour of odontogenic origin, with a characteristic lining of parakeratinized stratified squamous epithelium and potential for aggressive, infiltrative behaviour.” WHO “recommends the term keratocystic odontogenic tumour as it better reflects its neoplastic nature” (Jonathan M and Henry L, 2004). It is named keratocyst because the cystic lining produces keratin. There is general agreement that OKCs develop from dental lamina remnants in the mandible and maxilla. However, an origin of this cyst from extension of basal cells of the overlying oral epithelium has also been suggested. It represents approximately 10 percent of all jaw cysts and may occur in a wide age range of patients (Paul S B et al., 2012).

The cyst occurs in any age group, but most commonly seen in the second and third decades of life with male predilection. There are no characteristic clinical manifestations. The more common features are pain, soft tissue swelling, expansion of bone, drainage, and paraesthesia of the lip or teeth. In many instances, patients are remarkably free of symptoms until the cyst has reached a large size, involving the maxillary sinus or the mandibular ramus, including the condylar and coronoid process. This occurs because the OKCs tend to extend in the medullary cavity and clinically observable expansion of the bone occurs late. The particular tendency to rapid growth is due to higher activity of the epithelial cells of the cyst lining stimulating osteolytic activity of prostaglandin substances in the cell population of the cyst lining and higher accumulation of hyperkeratotic scales in the lumen of the cyst with resulting greater difference in hydrostatic pressure (Pazdera J et al., 2014). Radiographically, most OKCs are unilocular with scalloped margin when presented at the periphery and can be mistaken for radicular or lateral periodontal cyst. When the cyst is multilocular and located at the molar ramus area it may be confused to ameloblastoma. The septa present in ameloblastoma are coarse and curved; originate from the normal bone trapped within the tumor.

The following findings are highly suggestive of the diagnosis of OKC:
1. A cyst like radiolucency in the third molar region or mandibular ramus;
2. A diameter of more than 3 cm;
3. A unilocular cystlike radiolucency with scalloped margins;
4. A multilocular cyst; and
5. Odorless, creamy or caseous contents.

Multiple OKCs usually occur as a component of syndromes such as NBCCS, orofacial digital syndrome, Noonan syndrome, Ehler-Danlos syndrome and Simpson-Golabi-Behmel syndrome. The recurrence rate in these patients is higher may be because, as the number of keratocysts in an individual has, probability of recurrence is higher. As the number of keratocysts increases in an individual, the rate of recurrence also increases. Electrophoresis reveals low protein content (< 4g/100ml), which is mostly albumin. Treatment is either by wide (local) surgical excision or by marsupialization followed by enucleation and curettage or peripheral ostectomy after curettage and/or enucleation and application of Carnoy’s solution - 3 ml of chloroform, 6 ml of absolute ethanol, 1 ml of glacial acetic acid and 1 g of ferric chloride.

CONCLUSION

The odontogenic keratocyst (OKC, currently designated by the World Health Organization as a keratocystic odontogenic tumor) is a locally aggressive, cystic jaw lesion with a high growth potential and a propensity for recurrence. OKCs should be one of the differential diagnoses for the radiolucencies of jaws. Hence, careful clinical and radiographic examination has to be done to rule out any other existing lesion, followed by histopathologic correlation for proper patient treatment and follow-up. This will avoid the further complications, since OKCs are highly aggressive, have high recurrence rates and are associated with NBCCS.
REFERENCES