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ODONTOGENIC KERATOCYST

Dr. Puja Bansal , Shalu Tyagi,Sonia Sharma,Vandana Sinha
School of Dental Sciences ,Sharda University ,Greater Noida

Abstract

The odontogenic keratocyst (OKC) may occur at any age. However, it mostly occurs during the second and third decades of life. Compared to other odontogenic cysts, this type occurs with a frequency of 5-15%. It is more common in the mandible region and in the male sex. Histologically, odontogenic keratocysts are characterized by the presence of an external connective tissue capsule, with keratinizing lining of the epithelium consisting of 5-8 cell layers with marked palisadisation of polarized basal cells and a corrugated parakeratin layer.of OKC, with a regular follow-up, proved to be the effective therapeutic choice for the patients described in this article.

Introduction

The odontogenic cysts are a heterogeneous group of lesions which are, according to the new WHO nomenclature, classified into odontogenic inflammatory cysts (such as periapical/radicular cysts and collateral inflammatory cysts) and odontogenic and nonodontogenic developmental cysts[1]. In contrast to other odontogenic cysts, most authors agree that the odontogenic keratocyst (OKC) is unique due to its features, that is, local aggressiveness and high rates of recurrence. It is also specific due to its histological characteristics. Compared to other odontogenic cysts, OKCs occur with a frequency of
5-10%, or according to some authors, 12-14%[2]. However, scientific data regarding the incidence of OKC are heterogeneous, which is in fact a reflection of irregularities in diagnosing and selection of samples in individual studies. For example, in some studies, a lack of distinction was made between orthokeratinized and parakeratinized lesions, even though these two entities exhibit different histopathological characteristics and are recognized as different entities by the new WHO classification[3].

Clinical features

The odontogenic keratocyst (OKC) may occur at any age. However, it mostly occurs during the second and third decades of life. Compared to other odontogenic cysts, this type occurs with a frequency of 5-15%. It is more common in the mandible region and in the male sex.
OKC is more common in the mandible, in the lateral region, with the highest incidence in patients being between ten and thirty years of age. It shows mild predominance among male patients[4], whilst taking into account that there is no significant inclination of these lesions with regard to gender[2,5].

The research by Chirapathomsakul et al. has revealed that the OKC male to female manifestation ratio is 1.6 : 1[6]. Keratocysts are usually detected accidentally during regular radiographic imaging. The same lesion is represented as a unilocular or multilocular radiolucent formation with a sclerotic border towards the surrounding bone[7]. Although there are cases without symptoms, a number of authors emphasize that clinical manifestations, such as swelling and pain, may occur, individually or in combination[4].

Histological features

Histologically, odontogenic keratocysts are characterized by the presence of an external connective tissue capsule, with keratinizing lining of the epithelium consisting of 5-8 cell layers with marked palisadisation of polarized basal cells and a corrugated parakeratin layer[8].
OKC is characteristically composed of uninflamed fibrous walls, lined by a stratified squamous epithelium, which is 5-8 layers thick with a palisaded hyperchromatic basal cell layer and “corrugated” parakeratotic epithelial cells on the luminal surface.

History of nomenclature of odontogenic keratocyst

From 1950 to 2017, the classification of odontogenic keratocysts (OKCs) underwent substantial changes. Chronologically, the name “keratocyst” was first introduced in 1950. The same name was officially used in the WHO classification from 1971 to 1992. According to these classifications, there were two subtypes of odontogenic keratocyst
(OKC): the parakeratinized and orthokeratinized types. However, in 2005, these two types were classified as independent entities, mostly because of the differences in their tendency to recur. The parakeratinized type was classified as a “keratocystic odontogenic tumor” (KCOT) under the branch of epithelial tumors of odontogenic origin. The orthokeratinized type was classified as an orthokeratinized odontogenic cyst (OOC) as part of the entity of odontogenic developmental cysts[9]. According to the newest WHO classification from 2017, keratocystic odontogenic tumors
(KCOT) were again reclassified as odontogenic keratocysts (OKCs) but still diagnostically distinctive from orthokeratinized odontogenic cysts[10].

One of the reasons for the WHO’s reintroduction of the term “odontogenic keratocyst” (OKC) was because *PTCH1* gene mutations were found in other developmental cysts[11]. Another reason was the fact that marsupialization is an effective treatment method for OKC and may be associated with the return of the epithelium to normal, with lower rates of recurrence, which is not a characteristic of neoplasms[12]. It should also be said that OKCs are one of the diagnostic criteria for nevoid basal cell carcinoma syndrome, that is, Gorlin Goltz syndrome, inherited in an autosomal dominant fashion with variable expression[13].

Diagnosis and radiographic features

The origin of OKC is not quite clear. It is presumed to be either primordial, including dental lamina remnants, basal cells of the overlying epithelium, or dentigerous, which implies reduced enamel epithelium of the dental follicle[14,15].

Although OKCs are strictly diagnosed only by histological examination, there are some radiological and other features that can be of help in approaching the diagnosis, with an indication that these features are not pathognomonic for odontogenic keratocysts[16]. For example, the most common mandibular localization of OKC is the posterior part (angle and the ramus) where the anterior section of the maxilla is the most common OKC localization in the upper jaw[17]. OKC can be also seen in the molar region of the maxilla.

The radiological appearance of OKC is unilocular and multilocular. The same appearance can be seen in other jaw lesions of odontogenic and nonodontogenic origin. This is important in differential diagnosis where OKC may be misdiagnosed as other odontogenic and nonodontogenic cysts and ameloblastoma[18]. Unilocular lesions in relation to impacted teeth can look like dentigerous cysts, which is seen most in young patients.

OKCs, especially large ones, show a specific pattern of growth. Large mandibular OKCs grow in a mesiodistal direction along the length of the bone, with minimal buccolingual expansion[18].

An OKC located in the maxilla reveals expansion of the cortical bone, which can be seen as a bone deformity[16].

These cysts are usually asymptomatic for a long period of time. Patients usually seek help from doctors if deformities in the bones are noticed or if spillage of cystic pusor a fistula is present.

Of the other clinical features, OKC cystic fluid is also important. This content can be of different viscosities and colors, from straw yellow and thin to cheesy and thick[17].

Treatment

There are two methods in the treatment of these lesions, one conservative and the other aggressive[19]. The conservative method involves enucleation with or without curettage, decompression, and marsupialization[20]. Aggressive methods include peripheral ostectomy (with rotating instruments), cryotherapy (with liquid nitrogen), and application of Carnoy's solution[21]. All these methods have common goals: enucleation of the cyst and reducing the risk of recurrence and surgical morbidity. However, it is very difficult to monitor the therapeutic results in various studies, due to the small sample size, their retrospective nature, the deficiencies of the details described of the therapeutic procedures, and the variability of the control checkups[4].

The reported recurrence rates for OKC vary from 5% to almost 70%, depending on the therapeutic procedure[22].

Surgical factors are considered to have a significant impact on the probability of recurrence.

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