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Original Research Article.

Prevalence of Odontogenic Keratocyst in Kashmir Valley: A Retrospective Analysis Over 10 Years

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ABSTRACT

Objective: This study aimed to assess the demographic characteristics of odontogenic keratocyst in a tertiary dental healthcare center in Kashmir valley.

Materials and Methods: A retrospective analysis of data of 1460 cases obtained between 2007 to 2017 from clinical records of the patients visiting department of oral surgery, Govt dental college and hospital Srinagar was assessed. Information regarding age distribution, gender, anatomical location and recurrence was documented.

Results: In the present study the overall prevalence of the odontogenic keratocyst was 16.7%. The patients with odontogenic keratocysts varied in age from 9 to 65 years, and the mean age of patients was 28.9 years. 26 cases of odontogenic keratocyst were seen during third decade of life followed by 21 cases reported during the second decade of life. Males were found to be more commonly affected than females. The mandible (59.7%) was more often affected than the maxilla mainly mandibular molar to ramus area (n=41). The majority 46 (52.88%) of these lesions were asymptomatic and 41(47.12%) patients had symptoms such as swelling, pain, pus discharge, trismus or fever due to pericoronitis. 21% of the patients presented recurrence after the surgery mainly in second and third decade of life.

Conclusion: Odontogenic keratocysts comprised of 16.7% of oral lesions. The lesions mainly affected the males and were seen in younger age groups. Hence these data should be taken into consideration to improve planning of individual treatment and follow-up.

Keywords: Odontogenic Keratocyst, Prevalence, Oral Lesions.

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INTRODUCTION

Odontogenic keratocyst (OKC) 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. Philipsen in 1956 coined the term "odontogenic keratocyst" because of his thought that these were odontogenic cysts and not inflammatory in origin.[1] In contrast there were observations which showed that the odontogenic keratocyst behaved more as a neoplasm and not like a cystic lesion. Finally, in the World Health Organization classification (2005), the former odontogenic keratocyst was added to the benign odontogenic tumours category and the new term "keratocystic odontogenic tumor" was proposed.[2] Odontogenic cysts, conceptually inseparable from odontogenic tumors were omitted from the 2005 classification and have been reincorporated into the 2017 classification as odontogenic cyst.[3]

Odontogenic Keratocyst (OKC) is the third most common cyst occurring in the oral cavity and constitutes about 5.4- 17.4 percent of all odontogenic cysts.[4] They are most common gnathic lesions, arising mainly in the mandible particularly in the third molar region, mandibular angle, ramus, with a mandible-maxilla ratio of 2:1.1. This neoplasia is predominantly found in males and people of white origin. It can appear at any age however, it is more frequent between the ages of 20 and 30.[5] Occasionally they have been found to arise in a peripheral location especially in the gingiva which has earned them the term "peripheral odontogenic keratocysts." [6] Odontogenic keratocyst arises as an extension of the basal epithelial cells or the dental organ due to degeneration of the stellate reticulum or odontogenic epithelial remnants in the mandible or maxilla. Three theories have been proposed about the causes for tumor growth: an increase due to basal cell replication, increased osmotic pressure, or release of bone

resorbing factors (enzyme activity in osteolysis). It is considered that the main cause for the origin of this lesion is a lack of regulation and a mutation in the PTCH gene13.[7,8]

Diagnosis of odontogenic keratocyst is mainly done by histopathological analysis, biopsy and radiographic examination. The radiographic appearance of OKC may range from a small unilocular radiolucency to a large multilocular radiolucency. It has long been of particular interest because of its potential for local destructive behavior, its recurrence rate and its tendency for multiplicity particularly when associated with nevoid basal cell carcinoma syndrome.[9] There seems to be regional variations in the distribution of odontogenic cysts and tumors in the literature. Very few studies have been reported among Asians, especially from India. Epidemiological data on odontogenic keratocyst are lacking from Kashmir valley. Hence this study was undertaken to address the demographic characteristics of odontogenic keratocyst in a tertiary dental healthcare center in Kashmir valley.

MATERIALS AND METHODS

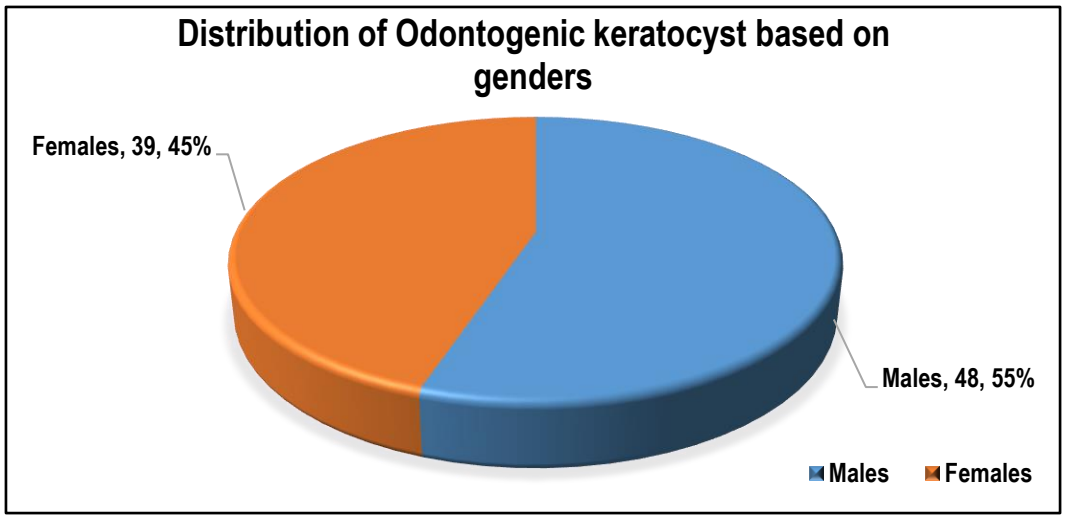
A retrospective analysis of data obtained between 2007 to 2017 from clinical records of the patients visiting department of Oral surgery, Govt dental college and hospital Srinagar and pathology was carried out.

1460 cases of odontogenic cysts and tumors were selected. The study included patients having detailed information on age, lesion location, gender and recurrence. The diagnosis was confirmed by revaluation of hemotoxylin and eosin stained specimens using the diagnostic criteria outlined in the latest WHO classification of the cysts and tumors. Cases with incomplete records were excluded from the study. The study data was reviewed by a single observer. The following variables were studied: anatomical location, age group, gender and recurrence. The collected data was reviewed, organized, tabulated and subjected to descriptive analyses and were represented as frequency and percentages according to the gender.

Table 1: Distribution of odontogenic keratocyst among different age groups

Age group	Male	Female	Total
<10	1	0	1
10-20	11	10	21
21-30	14	12	26
31-40	8	5	13
41-50	6	6	12
51-60	5	4	9
>60	3	2	5
Total	48	39	87

Fig 1: Distribution of odontogenic keratocysts based on gender



RESULTS

A total of 87 specimens out of a total of 1460 oral biopsies of odontogenic cysts and tumors evaluated histopathologically were designated as odontogenic keratocyst corresponding to overall prevalence of 16.7%. The age ranges from 9 to 65 years with mean age of 28.9 years. 26 cases of odontogenic keratocyst were seen during third decade of life followed by 21 cases reported during the second decade of life depicted in Table 1. The gender distribution showed a male predilection (n=48) which corresponds to a male: female ratio of about 1.23:1 (Table 2). Among 87 cases of odontogenic keratocyst, 41(47.12%) patients had symptoms such as swelling, pain, pus discharge, trismus or fever due to pericoronitis. The remaining 46 (52.88%) patients were asymptomatic.

Mandible was the most common jaw involved (59.7%) mainly the mandibular posterior region mainly the mandibular molar to ramus area (n=41), followed by multiple location (n=13), maxillary extent location (n=10). The distribution based on different anatomic sites is shown in Table 3. Of the total 87 number of patients with odontogenic cysts, 21% of the patients presented recurrence after the surgery mainly in second and third decade of life. Of the 87 cases of odontogenic keratocyst 4% cases of satellite cyst were reported.

Fig 2: Distribution of odontogenic keratocysts based on location

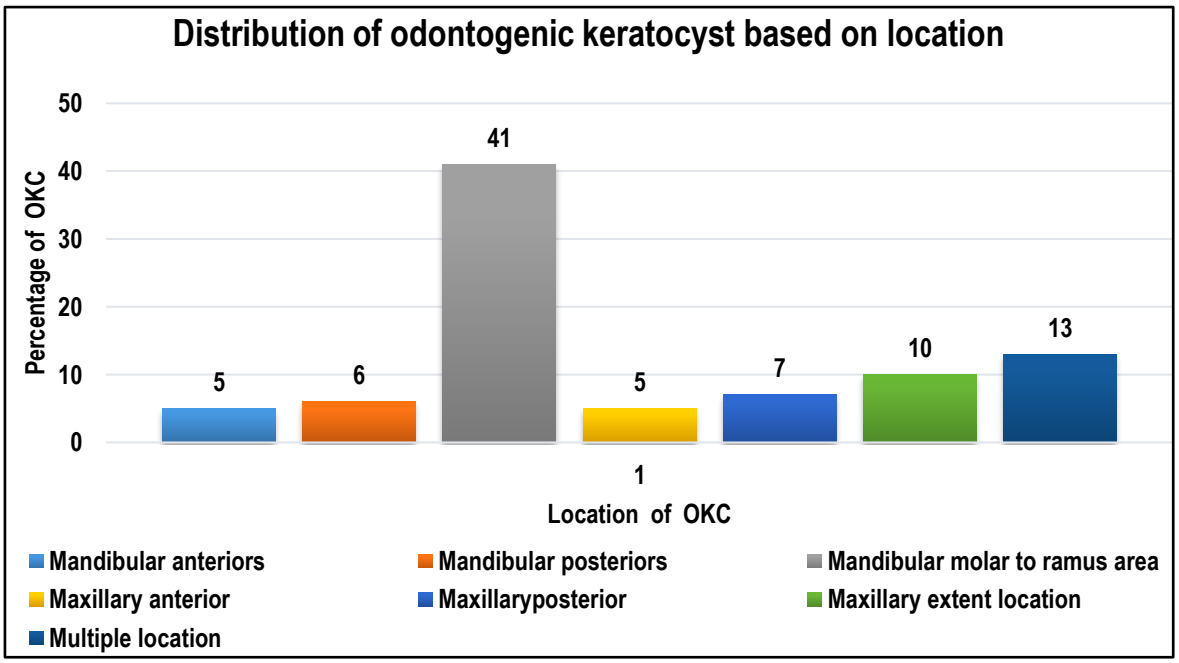
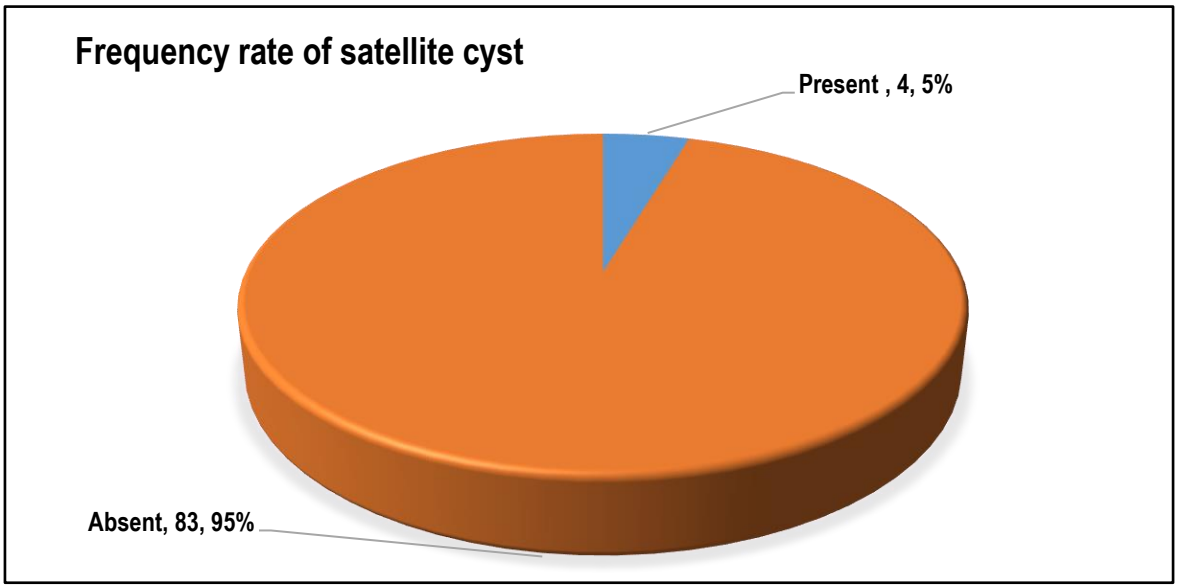


Fig 3: Frequency rate of the satellite cyst



DISCUSSION

Odontogenic keratocyst is a benign entity arising from remnants of the dental lamina with a relatively high prevalence. It has a potential aggressive behavior and a high recurrence rate, hence it requires special attention. Multiple authors have reported their invasive potential, due to its capacity to slowly grow in the anteroposterior marrow spaces, and can be transformed into a large lesion without causing notorious expansion.[10] The odontogenic keratocystic lesions experience geographical variations in different regions of the world and even the variation exists within the country. No previous study reported the patient demographics of odontogenic keratocyst for Kashmiri population. Hence study was conducted to assess the distribution of odontogenic keratocyst in Kashmir valley.

In the present retrospective study, 87 cases of odontogenic keratocyst were reported with an overall prevalance of 16.7%, presenting a lower frequency when compared with other studies investigated by Siriwardena et al among Sri Lanka population, showing odontogenic keratocyst incidence of 25.7%, Servato et al and Luo et al with 31.7% , 38.73% incidence respectively.[11-13] The present finding is consistent with the studies conducted by Meningaud et al. and Tawfik et al.[14,15] The study by Baghaei et al reported the prevalence of odontogenic keratocyst of 18.6%.[16] This variation among different population indicates the racial and environmental factors might probably influence on development of these lesions. The other probable reason could be due to the attitudes of the patients towards oral health. Many patients do not have the habit of routine regular dental check-up and only report to the clinics for symptomatic treatment and often engage in self-medications to relieve pain.

According to literature odontogenic keratocyst occurs over a wide age range with a peak incidence in the second and third decade of life and a gradual decline thereafter.[17] Similar results were seen

in our study with a mean age 28.9. This outcome supports the age occurrence reported by other investigators on Turkish and Indian population.[18,19] Studies by Myoung et al and Maurette et al reported third decade of life as the most common age of co-occurence.[20,21] A systematic review of odontogenic keratocyst revealed a mean age of 36.5 years with a peak of incidence in the second and third decades of life.[22] However, Kakarantza and Nicolatou found a peak incidence in 5th and 6th decades of life.[25]

Gender distribution of odontogenic keratocyst in the present study showed a slightly higher male predominance with male –female ratio 1.23:1.The present finding is concordance with the findings reported by Sharma et al, Dong et al and Selvamani et al where male predominance is seen over females.[17,24,25] Chirapathomsakul et al contradict the literature data, presenting a higher frequency in the female gender with male to female ratio (1:1.2) among Thai population and Maurette et al found a male to female ratio of 1:2.1 in Brazilian patients.[21,26]

Odontogenic keratocyst have a tendency to occur in any part of the mandible and maxilla, but the majority, almost 70%, arise in the body of the mandible.[27,28] The next common site is the maxillary canine region.[4,17] According to the pathology reports in the present study, odontogenic keratocyst was chiefly located in the posterior part of the mandible mainly the ramus of the mandible (68.8%). This finding is concomitant to previous studies indicating posterior region of mandible as the main location of OKC.[11,29] Goteti reported of odontogenic keratocyst location with a mandible-to-maxilla ratio of 1.6:1.[30] Odontogenic keratocyst of the soft tissue have been reported in other anatomic sites like the buccal mucosa and masticatory muscles apart from the gingiva.[6]

Several researchers have reported that 50-90% of odontogenic keratocyst are symptomatic at the time of diagnosis.[31] According to the results of this study, 47.2% presented with symptoms chiefly swelling. trismus and pericoronitis which is in agreement with the results of other studies.[20,32] Generally odontogenic keratocyst of the jawbone do not produce a large expansion of the cortex as the cyst proliferates within the marrow spaces, thus growing in a longitudinal manner.[33] This might be the reason some cases might go unnoticed. While others expand uniformly on all sides, resulting in a large buccal swelling as the main clinical presentation.[34]

The presence of one or more daughter cysts adjacent to the cystic wall of the tumor was demonstrated in 4% of the lesions, which is considerably lower than the figure reported by Myoung et al, Pavellic et al (20.09%) and Zhao et al (15.79%).[20,35,36] Figures for the incidence of recurrence in reported series have varied from 12% to 60%.[26,37] The odontogenic keratocyst is of particular interest because it is clinically more aggressive than other forms of odontogenic cyst and tends to recur after surgery.

The recurrence rate observed in our study was 21%. Habibi et al and Patricia et al reported lower recurrence rate of 8.4% and 13.1%.[31,38] In contrast Crowley et al found that 25% of their tumors recurred 9 or more years after initial treatment.[32] High recurrence rate may be associated with daughter cyst formation or may be attributed to the fact that younger patients receive more conservative treatment.

In conclusion, overall our results showed prevalence of 16.7%, but showed a marked geographical variation compared to other studies. The variation could be due to differences in the criteria used for diagnosis or cultural differences between the geographic areas which would require further research. Preservation of data available and the centralization of a tumor registry would benefit India very much. Thus, the knowledge of the clinical and histological behavior of these odontogenic keratocyst, gained through various epidemiological study, is needed to ensure early detection and prompt treatment for these lesions and prevention of morbidity.

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