



Distribution and Prevalence of Odontogenic Cyst in Bikaner Population: A 5 Year Retrospective

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ABSTRACT

The purpose of this study is to determine the prevalence of odontogenic cyst in Bikaner population and compare it with various reports from the other geographic areas of the Rajasthan. The files on odontogenic jaw cysts treated between 2011 and 2016 at the oral and maxillofacial surgery unit were retrieved retrospectively. Patient's demographic information mainly age, sex and location of the lesion was recorded and analyzed using descriptive statistics. The diagnosis of odontogenic cyst accounted in 150 cases and accounted for 15.31% of all lesions biopsied throughout the period. Mean age of the patient was 32.2 years, and 58% were male. The overall male to female ratio was 1.38:1. Radicular cyst was most prevalent histological type [48.67%] followed by dentigerous cyst, odontogenic keratocyst, lateral periodontal cyst, paradental cyst, residual cyst, adult gingival cyst, glandular odontogenic cyst, calcifying odontogenic cyst. The most common locations of the odontogenic cyst were the mandibular [49.33%] and posterior region [33.33%]. The distribution pattern of odontogenic cyst in study in this is relatively similar to that in other parts of the Rajasthan but there are some geographic differences with regard to the relative frequency, sex, and anatomic distribution of the odontogenic cyst.

KEYWORDS

Introduction

A cyst is defined as a pathological cavity containing fluid, semifluid or gas, which is usually lined by epithelium and is not formed by accumulation of pus. Odontogenic cyst on the basis of origin can be of two types: developmental or inflammatory. Inflammatory cyst is associated with inflammation while developmental cysts are of unknown etiology. Odontogenic cyst are unique in that they only affect the oral and maxillofacial region which are characterized by resorption of bone and develop from components of odontogenic epithelium or its residuals which remain trapped within the gingival tissue or bone.

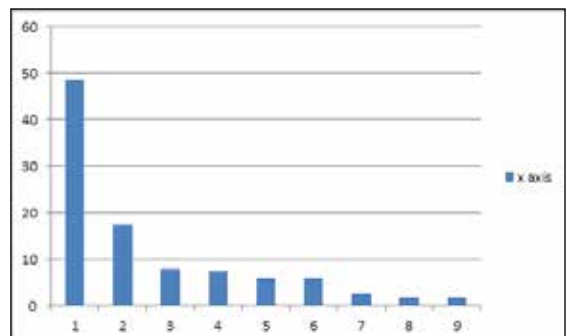
Clinical and radiological presentations are almost similar for many of these cysts hence clinical misdiagnosis is possible. Some of these are known to have an aggressive behavior and propensity to recur so correct diagnosis of these lesions is very essential. Hence surgically excised tissue should be duly studied histopathologically and properly diagnosed to ensure appropriate treatment.

Studies on prevalence of odontogenic cysts have been carried out in various cities of Rajasthan. Thus, the aim of the present study is to determine the frequency of different types of odontogenic cyst diagnosed histopathologically over a period of 5 years in Bikaner population according to age, gender and site affected.

Materials and methods

Case records between January 2011 and December 2015 [5 years] were retrieved from the files of oral and maxillofacial surgery unit. The lesions diagnosed as odontogenic cyst were only included in the study. Data regarding age, gender and anatomic locations of all lesions were compiled from the clinical data together with the biopsy reports.

Frequency of odontogenic cysts



Results

From a total of 780 lesions biopsied, 150 [15.31%] met the criteria of odontogenic cyst after histopathological evaluation. The overall frequency of odontogenic cysts over the 5 year period is shown in fig.1. Eighty seven were found in males and 63 in females [fig.2]. The overall male to female ratio was 1.38:1.

The mean age was 33.2years[range,8-74], with 27.33% of the cases being diagnosed in the third decade next 26% in the second decades of life and least in the first decade[2%]. Table1 shows the frequency of odontogenic cysts in all age groups.

Distribution of odontogenic cysts according to the anatomic site is shown in table 2 with 76 cases [50.67%] affecting maxilla and 74[49.33%] occurring in mandible. The distribution of odontogenic cysts according to anatomic site is as follows radicular cysts [48.67%], dentigerous cysts [17.33%], keratocyst [8%], paradental cysts [7.33%], residual and lateral periodontal cysts [6%] were the most frequent lesions, accounting for 87.33% of all odontogenic cysts collected from our data. Nearly one-third of the lesions [33.33%] were found in the mandibular posterior region and maxillary anterior [30%] as the second most common site.

The most frequent type detected was radicular cyst with male to female ratio 1.35:1. The lesions was predominantly seen in patients between 11-30 years of age. Maxillary anterior teeth [50.68%] were most commonly affected.

Second most common type of odontogenic cyst diagnosed was dentigerous cyst, which accounted for 26 cases [17.33%] with a male to female ratio 1.17:1. The majority of patients were under the age of 40years. Mandibular posterior region was the most frequent site affected [53.85%] next being maxillary posterior region [23.08%].

Keratocyst was the third most common cyst accounting to 12 cases [8%] with male to female ratio of 1.4:1. The majority of patients were in the second and third decades of their life. Mandibular posterior region [50%] was most frequent site affected followed by mandibular anterior region [25%].

Paradental cyst was the fourth most common cyst accounting

s.no.	Cyst	1-10	11-20	21-30	31-40	41-50	51-60	>60
1.	Adult gingival cyst	-	1	2	-	1	-	-
2.	Calcifying odontogenic cyst	-	-	1	-	1	-	1
3.	Dentigerous cyst	3	9	6	6	-	-	2
4.	Glandular odontogenic cyst	-	-	1	-	1	-	1
5.	Paradental cyst	-	3	2	2	4	-	-
6.	Odontogenic keratocyst	-	4	4	2	-	1	1
7.	Lateral periodontal cyst	-	3	-	-	5	1	-
8.	Radicular cyst	-	19	24	14	4	6	6
9.	Residual cyst	-	-	1	2	-	5	-
	total	3[2]	39[26]	41[27.33]	26[17.33]	16[10.67]	13[8.66]	12[8]

to 11 cases [7.33%] with a male to female ratio of 4.5:1. The majority of patients were in the fifth decade of their life. Mandibular posterior region [81.81%] was most frequent site affected followed by maxillary posterior region [18.18%].

Lateral periodontal cysts and residual cysts were fifth most common cyst accounting to nine cases each [6%]. Male to female ratio for lateral periodontal cyst was 1:3.5 while that for residual cyst was 3.5:1. The majority were in fifth decade in lateral periodontal cyst and in sixth decade in residual cyst.

Most of the lateral periodontal cyst occurred in mandibular posterior [66.67%] region while residual cyst occurred mostly in mandibular anterior region [44.44%].

Adult gingival cyst, glandular odontogenic cyst and calcifying odontogenic cyst were also diagnosed. These odontogenic cysts predominantly affected the mandible.

Table 1: Frequency of odontogenic cyst according to age

s.no.	Type of cyst	Maxilla, n %		Mandible, n%		Total
		anterior	posterior	Anterior	Posterior	
1	Adult gingival cyst	1[25]	-	-	3[75]	4
2	Calcifying odontogenic cyst	1[3.33]	-	-	2[6.67]	3
3	Dentigerous cyst	1[3.85]	6[23.08]	5[19.23]	14[53.85]	26
4	Glandular odontogenic cyst	1[3.33]	-	-	2[6.67]	3
5	Paradental cyst	-	2[18.18]	-	9[81.81]	11
6	Odontogenic keratocyst	1[8.33]	2[16.67]	3[25]	6[50]	12
7	Lateral periodontal cyst	-	1[11.11]	2[22.22]	6[66.67]	9
8	Radicular cyst	37[50.68]	10[27.4]	10[13.7]	6[8.22]	73
9	Residual cyst	3[33.33]	-	4[44.44]	2[22.22]	9
	Total	45[30]	31[20.67]	24[16]	50[33.33]	150

Distribution of odontogenic cyst according to the anatomic site

Odontogenic cysts	Bikaner [current study]		Jaipur [2015]		Jodhpur [2014]		Ajmer [2013]		Jaisalmer [2012]		Sriganganagar [2011]	
	n	%	n	%								
Radicular cyst	73	48.67	265	52.2	1,494	59.2	118	47.8	465	37.8	3,724	52.3
Dentigerous cyst	26	17.33	156	30.7	546	21.6	108	43.7	303	24.7	1,292	18.1
Odontogenic keratocyst	12	8.00	-	-	-	-	-	-	239	19.4	828	11.6
Paradental cyst	11	7.33	28	5.5	113	4.4	-	-	23	1.8	402	5.6
Residual cyst	9	6.00	30	5.9	328	13	15	6.1	99	8.0	573	8.0
Lateral periodontal cyst	9	6.00	09	2.3	17	0.7	03	1.2	7	0.6	28	0.4
Adult gingival cyst	4	2.67	05	1	10	0.4	-	-	4	0.3	16	0.2
Glandular odontogenic cyst	3	2.00	04	0.8	01	0.03	-	-	4	0.3	11	0.2
Calcifying odontogenic cyst	3	2.00	-	-	-	-	-	-	-	-	21	0.3
Total	150 cases		507 cases		2,523 cases		247 cases		1,227 cases		7,121 cases	

Comparison of the relative frequency of odontogenic cysts in the present study and selected references from cities

Discussion

One of the most common lesions affecting the jaws is odontogenic cysts and many of them share similar clinical and radiographic features. Hence, the diagnosis of odontogenic cysts should be based on careful clinical examination, radiographic and histopathologic features.

The 150 cases of odontogenic cysts identified in the present study accounted for 15.3% of all specimens. Similar results have been reported in previous studies involving populations from Sriganganagar, Jodhpur, Jaipur, Ajmer, Udaipur and Jaisalmer. The studies involving Ajmer populations have shown lower frequencies of odontogenic cysts ranging from 7.8 to 8.4%.

Males showed discrete predominance in our series [58%] and agrees with studies conducted in other cities with frequencies ranging from 52.5 to 65.0%. On the contrary female predominance was found in Jaipur population.

As per anatomic location, the most odontogenic cysts affected the mandible, particularly the posterior region [33.33%] followed by the anterior region of the maxilla [30%]. Coherently, these regions have been reported as the most common location of odontogenic cyst lesions in other studies. In contrast, a study conducted in Lithuania found a higher frequency of odontogenic cyst in the maxilla, with a proportion of 1.5:1.

In the present study, the most common odontogenic cysts were radicular cysts, dentigerous cysts and keratocyst. These lesions accounted for 74% of all odontogenic cysts in our sample which is in accordance to studies in various cities.

The most frequent type of odontogenic cysts are radicular cysts, accounting for 48.67% of all odontogenic cysts. Most similar studies reported a relative frequency between 47 and 58%. Our results showed an increase in the incidence of radicular cyst between the second and third decade of life in agreement with other studies. In contrast, studies involving populations from Sriganganagar and Udaipur have shown a peak incidence between third and fourth decades of life. The inflammatory genesis of radicular cysts was related to possible long term chronic pathologic processes mainly in the males [57.3%] who neglected oral hygiene as well as to a greater frequency of trauma in the anterior maxillary region [50.68%]. In agreement with other studies in our series radicular cysts were prevalent among males with a male to female ratio of 1.35:1. The male predominance of radicular cysts might be related to the fact that men are more prone to trauma to the maxillary anterior teeth.

The second most common odontogenic cyst was dentigerous cyst, with frequencies ranging from 11.4% to 33.0%. Most cases are diagnosed in men. The posterior region of the mandible is the site most frequently affected by these lesions, similar findings were observed in the present study. According to Jones et al, the high frequency of dentigerous cyst at these sites is not a surprising finding since the lower third molars are the teeth most commonly impacted. Most cases of dentigerous cysts are diagnosed in the second decade of life, a fact also observed in the study. However, Jones et al reported a peak incidence between fifth and sixth decades. Male predilection was more frequently noticed with male to female ratio being 1.17:1. This was in agreement with Bataineh et al, Torrici et al, Mosqueda et al, Meningaud et al.

Para and orthokeratinised variants of keratocysts were previously described. According to the new WHO classification, these cysts have now been reclassified as keratocystic odontogenic tumor. With inclusion of keratocyst it occupied the third most common diagnosis with frequency ranging from 1.3 to 21.5%, in agreement with the present findings. Most cases of keratocyst are diagnosed in male in second and third decades

of life. In contrast, the study conducted on a population from Turkey demonstrated frequencies of these lesions in female. The posterior region of mandible is the most common location of keratocyst. The recurrence rate of keratocyst has been extensively studied in the literature. Regarding variations in number of patients and duration of follow-up examinations are not routinely performed and recorded; therefore, no systemic data concerning with the recurrence rate could be retrieved from the files.

Multiple cases of keratocyst have been reported in the literature that could be associated with Gorlin syndrome. The main focus of this study was odontogenic cysts as separate entities not associated with other diseases. Also it should be noted that patients, records in our institution are not computerized and follow-up examinations are not routinely recorded. The possibility that patients may visit different centers for recurrent or multiple lesions should be considered. Therefore, we could not draw any conclusion regarding the prevalence of this syndrome among our cases. Paradental cyst is an inflammatory origin odontogenic cyst usually occurring on the lateral root surface of a partially erupted tooth and secondarily to inflammation associated with pericoronitis. In the present series 11[33%] cases were found mainly in mandibular posterior region with male predominance as in accordance with Urrutia et al, Jones et al, Sharifian and Khalili and Mosqueda et al. The relative frequency of this lesion varies from 1 to 5.6%. These cysts are diagnosed in the third decade of life. In contrast to this, our study revealed four cases that were in the fifth decade; these lesions were mostly retained after the eruption of last molars.

Lateral periodontal cysts occur laterally to the roof of vital tooth, causing no clinical signs and symptoms and are therefore normally found in routine radiographs. Frequency of this type of cyst ranges from 0.3 to 8% of all odontogenic cysts which were in accordance to our study. Females were more frequently affected in the fifth decade and in mandibular posterior region. Male predominance was found by Jones et al, Mosque et al and Meningaud et al. there does not seem to be a positive gender predilection in this entity.

Residual cyst occurs as a remnant of infection within the jaw due to improper removal of the infected tissue during the removal of tooth. This accounted for 6% of all odontogenic cysts. Urrutia et al accounted for 5.9%, Ledesma et al accounted for 6.1% and Ochsenius et al mentioned 13% of cases. These lesions occurred in the sixth decade with male predominance and mainly in the mandibular anterior region. In the present study, residual cysts were the fifth most frequent type of odontogenic cyst. However, our findings differ from those reported by other authors who found this type of lesion in the third and fourth decades. These lesions are well distributed among different age groups and are prevalent above the seventh decade of life in many aforementioned studies. Younger patients are also affected when teeth are lost prematurely.

Our cases accounted for 2.67% of gingival cysts of adults. These cysts are thought to arise from the epithelial remnants within gingival connective tissue. They commonly present in the fifth and sixth decades if life but in our study we found them in the third decade. Mandible [75%] was most frequent site mainly in females than in males[3:1] which was in accordance with Jones et al. the gingival cysts of infants is rarely submitted for histopathological diagnosis as these lesion usually undergo spontaneous involution within 3 months of birth.

Glandular odontogenic cysts and calcifying odontogenic cysts were lesions with lower frequency of 2% each. Calcifying odontogenic cyst has been classified as calcifying cystic odontogenic tumor, an odontogenic tumor in the new classification. These lesions occurred in the third, fifth and seventh decade, predominantly in mandibular posterior region with male predilection. This was in accordance with other studies Avelar et al, Jones et al, Kaplan et al. calcifying cystic odontogenic tu-

mor was first coined by Gorlin in 1962. Some authors tend to calcifying odontogenic cysts as two entities both a cyst and a tumor. The frequency of occurrence is estimated at less than 1%. In our study we found its occurrence as 2%. There was a predilection for males [2:1] with approximately equal distribution for each decade and an age range from 22-74 years, which is in accordance with Jones et al.

Conclusion

Our studies revealed that there is a wide range of odontogenic cysts, with some cysts having a predilection for certain age, sex and sites. It is important to realize that some of these cysts have a high tendency to recur as well as behave in a locally aggressive manner. Lesions such as keratocyst can grow to a larger size, resulting in facial deformity, destruction of facial structures and difficult surgical management. It is essential that these lesions are detected as early as possible to minimize any necessary surgery. Patients need to be reviewed regularly to monitor possible recurrence. Based on our findings, the distribution pattern of odontogenic cysts in Bikaner population is relatively similar to studies from other parts of the Rajasthan. The importance of collecting adequate clinical information regarding final diagnosis of these lesions and performing routine follow-up examination is further emphasized.