

Original Article

Clinicopathological Evaluation of Odontogenic Jaw Cysts.

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ABSTRACT

Background: Odontogenic cysts are the most common form of cystic lesions affecting the maxillofacial region and one of the main causes of the damage of these bones.

Objective: To determine the frequency of different types of odontogenic jaw cysts diagnose among the Bangladeshi population.

Study design: A descriptive observational study was made of 62 patients.

Study setting and period: The study was done in the Department of Oral & Maxillofacial Surgery, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka-1000 from 1st March' 2010 to 28th February'2011.

Participants: Sixty-two patients with cystic lesions in the maxillofacial region were selected for the study.

Methods: Patients who attended in the Oral & Maxillofacial Surgery Department of BSMMU during the study period with suspicious cystic lesion in the maxillofacial region were included in the study. After clinical diagnosis with odontogenic cysts all the patients were treated surgically either under local anesthesia or under general anesthesia if required. Cystic lining was then sent for histopathological confirmation. Data were collected from a total of 76 patients with a clinical diagnosis of odontogenic jaw cysts. Of those, data of 14 patients were not included in the analysis (Histopathology showed no cystic lesion in 6 patients and non odontogenic cyst in 8 patients). Therefore data of a total of 62 patients were analyzed for the purpose of the study. The study protocol was explained to the patients in detail before obtaining the informed consent from the patients. Patients were allocated for the study.

Outcome Variable: The following variable were recorded: gender, age, site of the lesion, swelling, tooth mobility, carious

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tooth, discolored tooth, missing tooth, radiological features, impacted tooth and correlation with histological types.

Results: Out of 76 histopathology reports analyzed, odontogenic cyst found in 62 cases (82%). The mean patient age was 28.06 years. The cysts were

slightly more prevalent in females (52%). Radicular cyst was the most prevalent histological type (56%), followed by dentigerous cyst (21%), odontogenic keratocysts (15%) and residual cysts (8%). The most common location of the odontogenic cysts were in the maxilla (n=35) than mandible (n=27).

Conclusion: The most frequently occurring lesion was radicular cyst and the site was the anterior region of the maxilla. The dentigerous cyst and odontogenic keratocyst were the next most common lesions and preferred site was in the ramus and angular region of the mandible.

Introduction:

A cyst is a pathological fluid, semi-fluid or gaseous-filled cavity lined by epithelium that, in turn, is lined by a capsule of connective tissue. They deserve one's attention, mainly because of all the complications they can originate, such as facial aesthetic changes, jaw fractures, infections, and occasional neoplasia of its epithelium¹.

Many classifications of jaw cysts have been proposed and used, according to different criteria such as its embryologic origin, aetiology, or its clinical-morphological manifestations. The World Health Organization (WHO) more recently, classifies epithelial cysts (or true cysts), as odontogenic cysts and non-odontogenic cysts. The first type includes two categories: inflammatory and developmental. Non-odontogenic cysts are also developmental cysts and include nasopalatine and nasoalveolar cysts, amongst others. Cysts without epithelial lining, also called pseudo-cysts, are nowadays considered to be non-neoplastic bone lesion and include solitary bone cysts and aneurysmal bone cysts^{1,2}.

Odontogenic cysts are one of the most common osseous-destructive lesions affecting the jaws. These cysts arise from the epithelial components of the odontogenic apparatus or

its remnants that lie entrapped within bone or in the gingival tissue. They are classified traditionally into a developmental group, including keratocysts and dentigerous cysts. The most recent classification of the World Health Organization (WHO) reallocated keratocyst (keratinized primordial cyst) within the classification of maxillary tumours under the term "keratocystic odontogenic tumour" (KOT). Its slow, expansible and non-infiltrating growth pattern constitutes clear evidence of its benign nature – a situation which may facilitate late diagnosis^{2,4,5,8,9,13,14-18}.

Odontogenic keratocysts (OKCs) are common, clinically aggressive lesions that are thought to arise from the dental lamina or its remnants. The most characteristics clinical aspect of odontogenic keratocysts (OKCs) is the high frequency of recurrence. The mechanism of recurrence is thought to be related to residues of cysts epithelium and an intrinsic growth potential following excision^{3,6,7,10,11,12,19,20,21}. Developmental odontogenic cysts and inflammatory odontogenic cysts are epithelial lesions, characterized by a slow growth and an expansible tendency and in spite of being entities which present a benign biological behavior, they can reach considerable size if they are not diagnosed in time and treated

appropriately. Since a number of cystic lesions of the jaws share similar clinical and radiographic features, the diagnosis of odontogenic cysts usually requires a detailed analysis of clinical, radiographic, and histopathologic findings^{2, 4,11,12,14, 22-25}.

Materials and Methods:

This was a cross-sectional, observational study conducted with 62 patients having odontogenic cyst of the jaw. The total period of study was from 1st March’ 2010 to 28th February ‘2011. The study was undertaken at inpatient and outpatient department of Oral and Maxillofacial Surgery, Bangabondhu Sheikh Mujib Medical University, Shahabag, Dhaka.

Eligible Patient came with cystic lesion in the mandible or maxilla was included in the study. After taking informed consent, data were collected by history, clinical examination, radiological and histopathological examination. The following variable were recorded: gender, age, site of the lesion, swelling, tooth obility, carious tooth, discolored tooth, missing tooth, radiological features of the lesions and associated with

impacted teeth and correlating with histological types

After the patient had given consent to be included in the study, a standardized structured data collection sheet was used to collect necessary information of the study subject. The data were screened and checked for any missing value and discrepancy. The data were then analyzed by using Microsoft Excel. Data were interpreted accordingly and were presented in tables, chart and bar diagrams.

Results and Observation:

The study was conducted in the department of Oral and Maxillofacial Surgery, BSMMU, Dhaka. The study was intended to determine the frequency of different types of odontogenic jaw cysts diagnosed among the Bangladeshi population. . A total of sixty-two patients were included. After collection of data, the data were assessed carefully and meticulously. Then it was entered in the computer for analysis. The data were then analyzed by using Microsoft Excel. Data were interpreted accordingly and were presented in tables, chart and bar diagrams.

Table -1: Distribution of the respondents according to type of lesion (n=76)

Type of lesion	Number	%
Odontogenic cyst	62	82
Non odontogenic cyst	8	10
Non cystic lesion	6	8
Total	76	100

Table -1: Shows that out of 76 suspective cystic lesion, 82% (n=62) were odontogenic cysts, 10% (n=8) were non odontogenic cysts and 8% (n=6) were non cystic lesion

Table -2: Distribution of the respondents according to Age (n=62)

Age (in years)	Number	%
<20	15	24
20-30	25	40
30-40	12	19
40-50	8	13
>50	2	3
Total	62	100
Mean±SD	28.06±8.56	

Table-2: Shows that the highest number of the respondents (n=25) were in the age group of 20-30 years (40%). Mean age of the patients were 28.06 years. Other patients were in age group 10-20 years (n=15) 24%, in age group 30-40 years (n=12) 19%, in age group 40-50 years (n=8) 13% and in age group >50 years (n=2) 3%.

Table -3: Distribution of the respondents according to Sex (n=62)

Sex	Number	%
Female	32	52
Male	30	48
Total	62	100

Table-3: Shows that 52% (n=32) of the respondents were female and male constituted 48% (n=30).

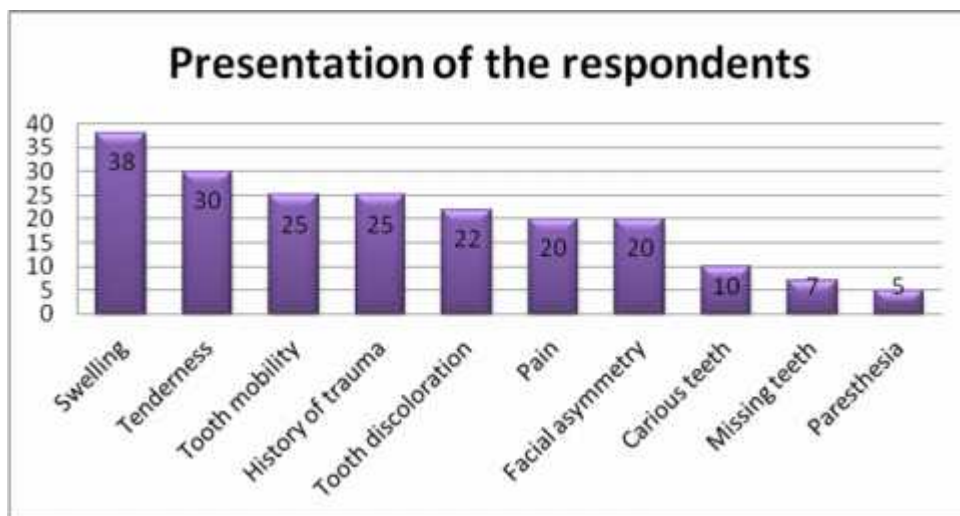


Fig-1: Presentation of the respondents

Fig-1: Bar diagram Shows that according to the clinical features 61% (n=38) had swelling, 48% (n=30) had tenderness, 40% (n=25) had tooth mobility, 40% (n=25) gave history of trauma, 35% (n=22) present with discolored tooth, 32% (n=20) had pain, 32% (n=20) had facial asymmetry, 16% (n=10) had carious teeth, 11% (n=7) had missing teeth and only 8% (n=5) had paresthesia.

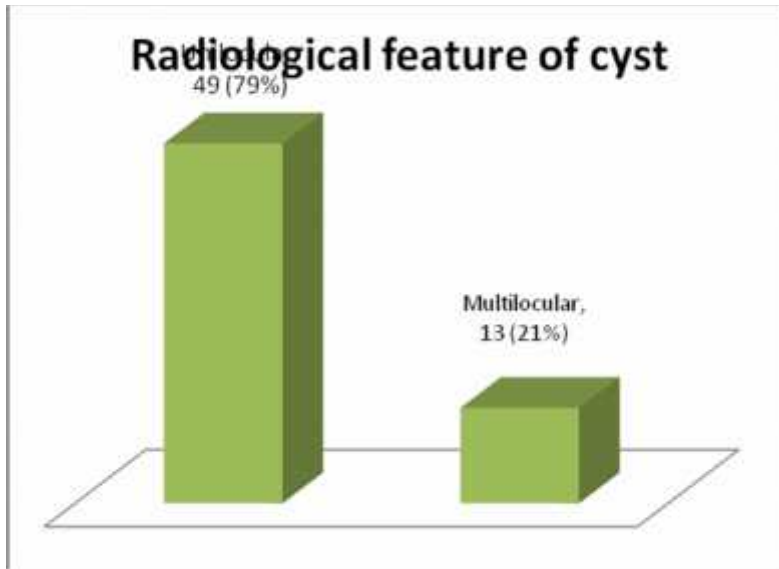


Fig-2: Radiological feature of cyst .

Fig-2: Bar diagram Shows that according to radiological feature 79% (n=49) lesions had unilocular radiolucency and rest of 21% (n=13) lesions had multilocular radiolucency.

Table -4: Distribution of the respondents according to Sector and Location of cyst (n=62)

Sector	Location	Number	%
Maxilla	Anterior	30	48
	Posterior	5	8
Mandible	Anterior	7	12
	Posterior	20	32
Total		62	100

Table-4: Shows that 56% (n=35) cyst were located in the maxilla and 44% (n=27) cyst were located in the mandible. In the maxilla 48% (n=30) were located in anterior part and 8% (n=5) were located in posterior part. In the mandible 12% (n=7) were located in anterior part and 32% (n=20) were located in posterior part.

Table -5: Distribution of the respondents according to Type of cyst (n=62)

Type of cyst	Number	%
Radicular cyst	35	56
Dentigerous cyst	13	21
Keratocyst	9	15
Residual cyst	5	8
Total	62	100

Table-5: Shows that among the cyst lesions 56% (n=35) were radicular cyst, 21% (n=13) were dentigerous cyst, 15% (n=9) were odontogenic keratocyst and 8% (n=5) were residual cyst.

Table -6: Distribution of the respondents according to age, sex & type of cyst (n=62)

Age Group (in years)	Radicular Cyst		Dentigerous Cyst		Odontogenic Keratocyst		Residual Cyst	
	Male	Female	Male	Female	Male	Female	Male	Female
<20	4	4	2	3	0	1	1	0
20-30	9	10	2	2	1	0	1	0
30-40	2	1	1	2	3	2	0	1
40-50	1	2	0	1	1	1	1	1
>50	1	1	0	0	0	0	0	0
Total	17	18	5	8	5	4	3	2

Table-6: shows that the highest number of the respondents 40% (n=25) were in the age group of 20-30 years followed by 24% (n=15) were in the age group of <20 years.

Table -7: Distribution of the respondents according to site of lesion & type of cyst (n=62)

Site	Radicular Cyst	Dentigerous Cyst	Odontogenic keratocyst	Residual Cyst	% (Total)	
Maxilla(Ant.)	26(42%)	3(5%)	0(0%)	1(1.5%)	48.5	56
Maxilla (Post.)	3(5%)	2(3%)	0(0%)	0(0%)	8	
Mandible(Ant.)	4(6%)	0(0%)	2(3%)	1(1.5%)	10.5	44
Mandible(post)	2(3%)	8(13%)	7(12%)	3(5%)	33	
Total	35	13	9	5	62	100

Table-7: In the maxilla 48% (n=30) were located in anterior part and 8% (n=5) were located in posterior part. In the mandible 11% (n=7) were located in anterior part and 33% (n=20) were located in posterior part. Also shows that among the radicular cyst 42% (n=26) located in the anterior maxilla and in case of dentigerous cyst & odontogenic keratocyst the common site was posterior mandible.

Table -8: Distribution of the respondents according to type of cyst & radiological type (n=62)

Type of Cyst	Unilocular	Multilocular	Total
Radicular Cyst	35(56%)	0(0%)	62(100%)
Dentigerous Cyst	9(15%)	4(6%)	
Keratocyst	0(0%)	9(15)	62(100%)
Residual Cyst	5(8%)	0(0%)	
Total	49(79%)	13(21%)	62(100%)

Table-8: Shows that in case of unilocular radiolucency, most frequent type was radicular cyst 56% (n=35) followed by dentigerous cyst 15% (n=9) and in case of multilocular radiolucency, most frequent type was keratocyst 15% (n=9) followed by dentigerous cyst 6% (n=4)

Discussion:

Out of 76 suspicious cystic lesion, histopathology report shows 82% (n=62) are odontogenic cysts, 10% (n=8) are non

odontogenic cysts and 8% (n=6) are non cystic lesion. Kavita Rao et al. who found that out of 809 biopsy reports 100 cases of odontogenic cysts (12.36%)².

In this study shows that the highest number of the respondents (n=25) are in the age group of 20-30 years (40%). Mean age of the patients are 28.06 years. This finding is close to that of Luis Monteiro et al. found the median age was 34 years, Kavita Rao et al. 42 years, Sergio Nunez-Urrutia et al. 42 years^{1, 2, 4}, Present findings is similar to that of Rafael L. Avelar et al. who also found the Mean patient age was 28.9 years⁵. Other studies support the present study^{6-12, 13, 14}.

Present study shows that 52% (n=32) patients are female and 48% (n=30) are male. These results are different than those of Luis Monteiro et al. who found 58.1% were men and 41.9% were women¹, these results are similar to those obtained by Kavita Rao et al. who found 52% were females and 48% were males and similar to those obtained by Banu Gurkan Koseoglu et al. Who found 53% were males and 47% were females^{2, 3}, which is differed by Sergio Nunez-Urrutia et al. who found 58% were males and 42% were females and Rafael L. Avelar et al. who found 57% were males and 43% were females^{4, 5}. Similarity found in other studies^{8-12, 14, 16}.

Radicular cysts are lesions which are produced as a consequence of pulpar necrosis and therefore, are considered to be of an inflammatory nature. In this study found that the radicular cysts represent 56% (n=35) of all odontogenic cysts, being the most frequent of all these lesions in relative terms; this finding is similar to that of Kavita Rao et al. who also found 52%, Banu Gurkan Koseoglu et al. who found 59%, Sergio Nunez-Urrutia et al. who found 50.2%, Rafael L. Avelar et al. who found 52.2%^{2, 3, 4, 5}. Jean-Paul Meningaud et al. , who found 53.5%, Lelia-Batista de Souza et al. , who found 61.4%^{6, 7}.and different than those of Luis Monteiro et al. , who found 48%

and German Ochsenius et al. , who found 47%^{1, 8}.

With respect to dentigerous cysts, in present study they occupied the second place in relative frequency, the figure being 21% (n=13), just as in the studies of Luis Monteiro et al. 21.0%, Kavita Rao et al. , who found 19%, Sergio Nunez-Urrutia et al. , who found 21.8%^{1, 2, 4} , Jean-Paul Meningaud et al. , which were 22.3%, Lelia-Batista de Souza et al. , who found 20.1%, German Ochsenius et al. , who found 18.5%^{6, 7, 8}.and different than those of Banu Gurkan Koseoglu et al. , who found dentigerous cysts were 14% and Rafael L. Avelar et al. Who found dentigerous cysts were 30.7%^{3, 5}. Others support the present study^{9, 10, 11, 12, 13, 14}.

With respect to keratocysts, these correspond to the third place within present study, the figure being 15% (n=9), this finding is similar to that of Luis Monteiro et al. , who found keratocysts were 12.1%, German Ochsenius et al. , who found kerato cysts were 14.3%^{1, 8} and different than those of Kavita Rao et al. , who found keratocysts were 20%, Banu Gurkan Koseoglu et al. who found keratocysts were 27%, Sergio Nunez-Urrutia et al. which were only 01%, Jean-Paul Meningaud et al. who found keratocysts were 19.1%^{2, 3, 4, 6, 15-19, 21}.

Rasidual cysts are those which remain in the maxillary bones after the causative tooth has been extracted. Rasidual cyst is an inflammatory odontogenic cysts resulting from incomplete resection of cystic tissue in the periapical zone of a previously extracted pathological tooth. One of the most interesting aspect of this study is the elevated number of cases of residual cysts; the represent 8% (n=5), this finding is similar to that of Kavita Rao et al. Who found residual cysts were 9%, Sergio Nunez-Urrutia et al. Which were 4.3%^{2, 4} and different that of Luis Monteiro et al. Who

found residual cysts were 17.7% and Lelia-Batista de Souza et al. Who found residual cysts were 17.3%^{1,7}.

With respect to anatomic location, most odontogenic cysts affected the maxilla 56% (n=35) and 44% (n=27) in the mandible. In the maxilla 48% (n=30) were located in anterior part and 8% (n=5) were located in posterior part. In the mandible 12% (n=7) were located in anterior part and 32% (n=20) were located in posterior part. The most frequent location of inflammatory cysts (radicular and residual cysts) was the maxilla, and for developmental cysts (keratocysts and dentigerous cysts) was the mandible, mainly in the posterior sector. These results are similar to those obtained by Luis Monteiro et al. Who as for the location of the cysts 53.3% of all cysts were on the maxilla and 46.5% were on the mandible. In the maxilla, the most affected sector was the anterior (59.7%), whereas in the mandible, the most affected sector was the posterior (81.5%), those of Kavita Rao et al. Who found, the maxilla (59%) was more commonly involved than the mandible (41%)^{1, 2}. The majority of cysts were detected in the anterior maxilla followed by the posterior mandible. In anterior maxilla, radicular cysts were more common. Odontogenic keratocyst was more common in the posterior mandible^{3-18, 22-25}.

In the present study Shows that according to radiological feature 79% (n=49) lesions had unilocular radiolucency and rest of 21% (n=13) lesions had multilocular radiolucency. Among the unilocular cyst 71% (n=35) were radicular cyst & 19% (n=9) were dentigerous cyst, 10% (n=5) were residual cyst. In case of multilocular radiolucency most frequent type of cyst were odontogenic keratocyst 69% (n=9), followed by dentigerous cyst which were 31% (n=4). These results are close to that of Luis Monteiro et al. Who found

radiological image was unilocular(90%), rest of were multilocular¹. Similarity found in other studies^{13, 14, 16, 18}.

Conclusion and recommendation

The present results showed a similar frequency of prevalence of odontogenic cysts when compared to other similar studies, with inflammatory cysts being identified as the most frequent odontogenic cyst. The most frequently occurring lesion was radicular cyst and the site was the anterior region of the maxilla. The dentigerous cyst and odontogenic keratocyst were the next most common lesions and preferred site was in the ramus and angular region of the mandible. Knowledge of the biological and histological behaviour of odontogenic cysts and their frequency are key aspects for ensuring early detection and adequate treatment. It is recommended that a detail history, thorough clinical examination and radiological evaluation are mandatory for the diagnosis and better management of odontogenic jaw cysts.

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