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Original article

Oral Odontogenic Cyst Study in Libya: Incidence and Diagnosis

Yousef M Hasen[1], Ali Milad[1], Rema M Hwas[1], Amina A Khalifa[1], Fatma Abd Twair[1], Ali Y Alkhboli[1], Mabrouka A Khalleefah[1*], Arabia H Basheer[2]

[1]*Faculty of Dentistry, University of Zawia, Zawia City, Libya*
[2]*Center Clinic, Saray Salam Diagnostic Center, Tripoli City, Libya*
***Corresponding Email**: m.khalleefah@zu.edu.ly*

ABSTRACT

Background and aims. *Odontogenic Cysts form a variety of lesions that lead to abnormal deviation of tooth formation and thus causing problems inside the mouth. The aim of this study is to determine the prevalence of oral cysts, the geographical distribution of the disease, and the ages targeted by the disease.* ***Methods.*** *Over a six-month period, 144 endoscopic biopsies from patients with oral problem were included. Endoscopic abnormalities, histological diagnosis of odontogenic cysts, and histopathological results of oral biopsies were recorded and then analyzed using SPSS.* ***Results.*** *Among 144 patients who visited Saray Salam Center during the period from 1st of May 2023 to 30th of Oct 2023, the number of cases of dental cysts was 46. The average age of the patients in the study varied between 45 and 89 years old, with a standard deviation of 19.719. The minimum registered age is 3 years, and the maximum is 86 years. Cysts were observed more in the age group between 1 year to 86 years while cysts were more common in males than in females. The histopathological results of cysts were 31.9%.* ***Conclusion.*** *Conditions such as increased cyst spread in the upper and lower jaw. It can also help in monitoring the spread of the dental cysts.*

Keywords: Odontogenic Cysts, Epidemiology, Diagnosis, Jaw Cysts.

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الخلفية والأهداف. تشكل الأكياس السنية مجموعة متنوعة من الآفات التي تؤدي إلى انحراف غير طبيعي في تكوين الأسنان وبالتالي تسبب مشاكل داخل الفم. تهدف هذه الدراسة إلى تحديد مدى انتشار الأكياس الفموية، والتوزيع الجغرافي للمرض، والأعمار المستهدفة بالمرض. **طرق الدراسة:** على مدى ستة أشهر، تم تضمين 144 خزعة بالمنظار من المرضى الذين يعانون من مشاكل في الفم. تم تسجيل التشوهات بالمنظار والتشخيص النسيجي للأكياس السنية والنتائج المرضية للخزعات الفموية ومن ثم تحليلها باستخدام برنامج SPSS. **النتائج**: من بين 144 مريضاً قاموا بزيارة مركز سراي سلام خلال الفترة من 1 مايو 2023 إلى 30 أكتوبر 2023، كان عدد حالات التكيسات السنية 46 حالة. وتراوح متوسط عمر المرضى في الدراسة بين 45 و 89 سنة. مع انحراف معياري قدره 19.719. الحد الأدنى لسن التسجيل هو 3 سنوات، والحد الأقصى 86 سنة. وقد لوحظت الأكياس بشكل أكبر في الفئة العمرية ما بين سنة واحدة إلى 86 سنة، بينما كانت الأكياس أكثر شيوعا عند الذكور منها عند الإناث. وكانت النتائج النسيجية المرضية للخراجات 31.9٪. **الخلاصة**: حالات مثل زيادة انتشار الكيس في الفك العلوي والسفلي. يمكن أن يساعد أيضًا في مراقبة انتشار الأكياس السنية.

INTRODUCTION

Odontogenic cysts (OC) are a pathological cavity that contains a fluid. This fluid may be semi-liquid or gaseous, with pus inside it, and it is not always visible. These dental cysts appear frequently in dentistry and are considered a disease of the mouth, face, and jaws. Inflammatory dental cysts are formed due to the activation of dental cell supports located within bone tissue or gingival tissue. Therefore, a correct diagnosis is essential for appropriate treatment and follow-up

[**1**,2]. Cystic lesions or OC are found more frequently in the jaw than in any other bone, and they are considered a frequent cause of swelling in the jaw area. Cystic lesions have been classified over the years in different ways, based on tissue origin or other characteristics [3]. OC are bone-destructive lesions that arise from remnants of the epithelium and mesenchyme of dental embryogenesis, such as the epithelial rests of Malassez, the rests of Ceres, and the dental follicle [4]. A thorough exploration of the oral cavity is essential. Get the correct diagnosis. This affects the diagnosis and the implementation of the appropriate treatment for each of them. A comprehensive exploration of the oral cavity is necessary in order to reach a correct diagnosis [5]. This is beneficial for appropriate treatment and affects the person in terms of speed of diagnosis [6].

The World Health Organization (1992) classified dental cysts as infections that occur in the origin of the tooth, are sometimes asymptomatic, and may increase in size to a large extent before clinical signs appear. These cases are explained by radiological imaging [7]. Odontogenic keratocysts are potentially aggressive and have high prevalence rates. Seventy to 80% of them are located in the mandible, usually in the area between the third molar and the molar and the angle of the mandible, from where they grow toward the ramus and body. They are generally asymptomatic lesions and can grow quite large. They are often found on routine radiographs dental cysts [8]. The classification of these pests has changed in recent decades. Nowadays, there is a more accepted classification that divides these lesions into the following six types: dental cysts, radicular cysts, lateral periodontal cysts, periodontal cysts, keratodontogenic cysts, and calcified keratodentinal cysts [9]. The recurrence of dental cysts and tumors is important, as patients need a realistic opinion about the likelihood of this occurring and therefore its causes and the possibility of reducing it. [10] Dental cysts can be classified as developmental type" or "inflammatory type." Includes developmental odontogenic cysts Keratocyst, odontogenic cyst, lateral periodontal cyst, sialo Dental cyst, eruptions, and gum abscesses. Early and accurate diagnosis often leads to appropriate treatment [11]. The World Health Organization (WHO) in different parts of the world has confirmed the weakness of studies in this field [12]. Dentists notice that cysts of dental origin are among the most common. The most common lesions among patients of all ages [13]. The aim of this study was to determine the prevalence of oral cysts, the geographical distribution of the disease, and the ages targeted by the disease.

METHODS

During the period from the beginning of May to the end of October, 01-05-2023 to 30-10-2023 For a period of six months, during this period, 144 patients attended this study, as the patients were suffering from oral problems. They came to the Saray Salam Center in the city of Tripoli, Libya, to conduct a detection of the types of cysts present inside the mouth. The patients were suffering from oral problems, and among the 144 patients, there were about 78 females and 66 males, with ages ranging from 0 to 81 years. A biopsy was taken to detect the presence of various types of cysts inside the mouth using hematoxylin and eosin stain, and the results were analyzed using the SPSS program.

RESULTS

Table (1) The age average of the patients in the study is 45.89 years, with a standard deviation of 19.719. The minimum age recorded was 3 years, and the maximum was 86 years. This suggests a wide range of ages among the patients, with a notable standard deviation indicating a relatively high degree of variability in the ages of the individuals included in the study.

Table 1. Mean Age of Patients

Variable	Minimum	Maximum	Mean	SD
Age (Yrs.)	3	86	45.89	19.719

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The table (2) presents the association between gender and city in relation to the presence of a particular condition. The chi-square test was used to assess the relationship, and the results indicate a statistically significant association between gender and city ($\chi 2 = 20.88$, $p < 0.001$). The table also provides the frequency and percentage of patients in different cities and of different genders. Apparently, there are variations in the distribution of patients across cities and genders, and the association between these variables is statistically significant.

Table 2. The association between Gender and city

Gender	Patient		City								Chi Square	P-value
			Tripoli		Al-zawia		Sabha		Gharyan			
	N	%	N	%	N	%	N	%	%	%		
Male	66	45.8	56	49.1	7	43.8	1	20	2	22.2	20.88	< 0.001
Female	78	54.2	58	50.8	9	56.2	4	80	7	77.7		
Total	144	100	114	100	16	100	5	100	9	100		

The table 3 presents the association between gender and city for patients. The chi-square test was used to assess the relationship, and the results indicate that statistically there is no significant association between these variables ($\chi 2 = 2.759$, $p = 0.252$). The table also provides the frequency and percentage of patients in different cities and of different genders. It appears that there are no significant variations in the distribution of patients across cities and genders.

Table 3. The association between Gender and city and patient

Gender	Patient		City								Chi Square	P-value
			Tripoli		Al-zawia		Sabha		Gharyan			
	N	%	N	%	N	%	N	%	N	%		
Male	24	52.17	22	56.4	2	40	0	0	0	0	2.759	0.252
Female	22	47.83	17	43.6	3	60	2	100	0	0		
Total	46	100	39	100	5	100	2	100				

The table (4) presents the distribution of cases of odontogenic cysts according to gender. It shows that out of a total of 46 cases, 24 (52.17%) were male and 22 (47.83%) were female. The age average for male patients with odontogenic cysts was 37.17 years with a standard deviation of ±17.55, while for female patients, the age average was 38.41 years. The t-value and p-value indicate that there is no statistically significant difference in the age average of male and female patients with odontogenic cysts ($t = -0.221$, $p = 0.826$). This suggests that there is no significant difference in the age average between male and female patients with this condition.

Table 4. Distribution of cases of odontogenic cysts according to gender

Gender	Number of cases	%	Mean age +/– SD	T value	P-value
Male	24	52.17	37.17±17.55	-0.221	0.826
Female	22	47.83	38.41±20.49		
Total	46	100			

The table 5 presents the prevalence of odontogenic cysts according to age groups. It shows the number of cases within each age range and the specific type of odontogenic cyst present in each group. In the age group 11-20, there were 11 cases in total, with 6 cases of Radicular cysts, 3 cases of Dentigerous cysts, and 2 cases of Odontogenic keratocysts. The table provides a comprehensive breakdown of the prevalence of different types of odontogenic cysts within each age group, offering valuable insights into the distribution of these cysts across different age ranges.

Table 5. Prevalence of odontogenic cysts according to age.

Age (Yrs.)	Number	RadC	ResC	EruC	DenC	OdoC	LatC	ParC	GinC
01 – 10	2	-	-	-	2		-	-	-
11-20	11	6	-	-	3	2		-	-
21-30	5	2	-	-	-	3		-	-

31-40	8	6	-	-	2	-		-	-
41-50	7	5	-	-	1	1	2	-	-
51-60	6	1	-	-	1	2		-	-
61 – 70	5	4	-	-	-	-	1	-	-
71 – 80	2		-	-	1	-	1	-	-
>81	-		-	-	-	-	-	-	-
Total	46	24	-	-	10	8	4	-	-

Table 6 presents the distribution of cases of odontogenic cysts according to their frequency. It shows that out of a total of 46 cases, Radicular cysts were the most prevalent, accounting for 52.17% of the cases. Dentigerous cysts were the next most common, representing 21.74% of the cases, followed by Odontogenic keratocysts at 17.39% and Lateral periodontal cysts at 8.70%. This breakdown provides a clear understanding of the relative frequency of different types of odontogenic cysts within the studied population.

Table 6. Distribution of cases of odontogenic order of frequency

Type	Number of cases	Frequency (%)
Radicular cyst	24	52.17
Dentigerous cysts	10	21.74
Odontogenic keratocyst	08	17.39
Lateral periodontal cysts	04	8.70
Total	46	100.0

The table 7 presents the distribution of odontogenic cysts according to their anatomical site within the maxillary and mandibular jaws. It shows the number of cases for each type of cyst in the right and left sides of the maxillary and mandibular jaws. For example, it indicates that out of the 24 cases of Radicular cysts, 12 were in the right maxillary jaw, 2 in the left maxillary jaw, 6 in the right mandibular jaw, and 4 in the left mandibular jaw. Similarly, it provides the distribution for other types of cysts.

Table 7. Distribution of odontogenic cysts according to anatomical site

Type of cyst	Maxillary jaw		Mandibular jaw		Total
	Right	left	Right	Left	
Radicular cyst	12	2	6	4	24
Residual cysts	–	–	–	–	–
Eruption cyst	–	–	–	–	–
Dentigerous cysts	3	2	1	4	10
Odontogenic keratocyst	1	0	2	5	8
Lateral periodontal cysts	3	0	0	1	4
Paradental cyst	–	–	–	–	–
Gingival cyst	–	–	–	–	–
Granular odontogenic	–	–	–	–	–
Total	19	4	9	14	45

The table (8) provides the relative frequency, sex distribution, and mean ages of patients diagnosed with different types of cysts. It indicates that out of the 24 cases of Radicular cysts, 12 were male and 12 were female, with a mean age of 38.17 years and a standard deviation of ±16.85. Similarly, it provides this information for Dentigerous cysts, Odontogenic keratocysts, and Lateral periodontal cysts.

This comprehensive breakdown offers insights into the relative frequency, gender distribution, and mean ages of patients diagnosed with different types of cysts, which can be valuable for understanding the epidemiology and clinical characteristics of these conditions.

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Table 8. Relative frequency, sex distribution and mean ages of patients with cyst

Diagnosis	Number	Percent	Mean age +/– SD	Male (n)	Female (n)
Radicular cyst	24	52.17	38.17±16.85	12	12
Dentigerous cysts	10	21.74	31.10±22.39	5	5
Odontogenic keratocyst	8	17.39	33.13±16.23	5	3
Lateral periodontal cysts	4	8.70	61.25±8.22	2	2
Total	46	100		24	22

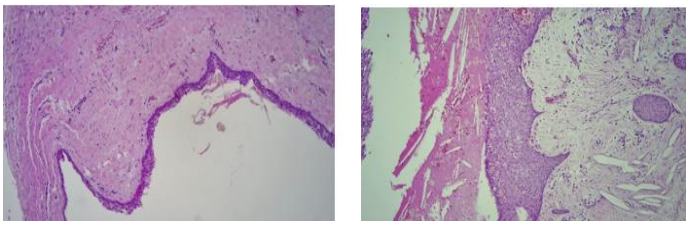

Figure 1a. Histology of radicular cyst.

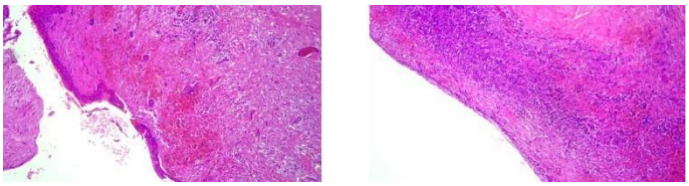

Figure 1b. Histological appearance of dentigerous cyst.

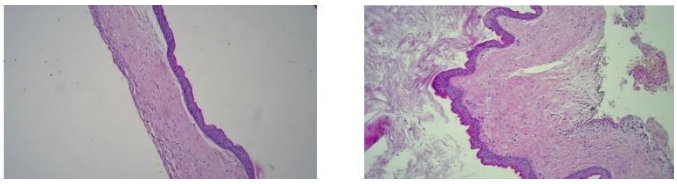

Figure 1c. Histological features of odontogenic keratocytes.

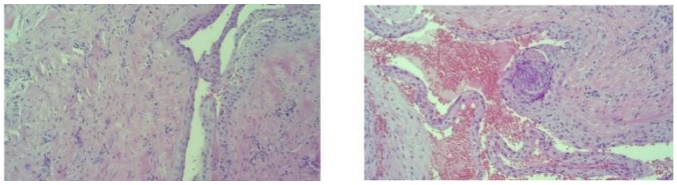

Figure 1d. Histological cyst wall of lateral periodontal cyst.

DISCUSSION

Nearly half of the world's population (45%), equivalent to 3.5 billion people, suffer from oral diseases, although the incidence of odontogenic cysts varies greatly depending on place of residence, age, and economic status. In general, 3 out of every 4 infected people are people with limited income, the elderly, and those who live in low- and middle-income countries. The global incidence of oral diseases has increased by one billion cases over the past thirty years, as dental problems and gum diseases are among the most common oral diseases. Tooth loss is the final stage in the history of the disease. The global average rate of dental problems is about 7% among people aged 20 years, and the percentage increases with age to 23% for those aged 60 years and older. World Health Organization reports on the state of oral health indicate that two billion people suffer from tooth loss. Of the caries of permanent teeth, 514 million children suffer from caries of primary (baby) teeth [14]. This study found that 46 patients, or about 31.9%, had odontogenic cysts out of a total of 144 patients who visited the Saray Salam Diagnostic Center. These patients suffer from symptoms and problems in the mouth and teeth. Most studies on dental cysts raise concern about the causes of their occurrence, as explained that cysts of odontogenic origin are the most common. study showed that the radicular cyst is the most common cyst, constituting 52.17% of people aged 11–20 years, and the percentage of males was 52.17% of the population. Females: 47.8%, and this is consistent with international rates, as most studies indicated that it is the most common, and this agrees with the study that was conducted in Libya at Al-Arab Medical University, which indicated that it was the first study in this field, while the study indicated that the incidence of radicular cysts reaches 68.1% [11]. While the percentage in a study in America was 56% [15], this percentage was close to 68.8% in a study in Canada [16]. This is slightly less than what was found in a study in Syria (49). [17] The prevalence of root cysts in Libya is far from the results of the study in Nigeria [18, 19]. (21.4%) . Dentigerous cysts occupy

the second place with a percentage of (21.74), and this agrees with what was recorded in Moscow (33.3%) that it is the most common cyst among the ages of 20-30 [20]. Odontogenic keratocysts were 21.5% [21]. This contradicts the study, as the percentage in the study is slightly lower.

This study closely agreed with international studies in terms of anatomical distribution, as our study indicated that the upper jaw is affected by maxillary cysts at a rate estimated at 73.6% in the upper jaw, and this may be due to a high percentage of radicular cysts [16, 22], and this contradicts [23, 24]. Which indicated that the posterior lower jaw was the most commonly affected by cysts, followed by the anterior upper jaw. This result was expected because the lower third molars and upper canines are the teeth most affected by this type of cyst. In most cases, patients may refuse surgical treatment and demand that only the tooth in which the injury occurred be removed [15,25]. The observed prevalence rate and locations of dental abscesses vary according to geographical regions, [26] and early detection and therefore early diagnosis are considered an impenetrable barrier to increasing the spread of dental damage.

CONCLUSION

There is need for more studies in Libyan populations to establish the true pattern of odontogenic cysts.

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REFERENCES

1- Selvamani M, Donoghue M, Basandi PS. Analysis of 153 cases of odontogenic cysts in a South Indian sample population: a retrospective study over a decade. Braz Oral Res. 2012 Jul-Aug;26(4):330-4.
2- Ochsenius G, Escobar E, Godoy L, Peñafiel C. Odontogenic cysts: analysis of 2,944 cases in Chile. Med Oral Patol Oral Cir Bucal. 2007;12(2):E85-91.
3- Wang YJ, Zhang JY, Dong Q, Li TJ. Orthokeratinized odontogenic cysts: A clinicopathologic study of 159 cases and molecular evidence for the absence of PTCH1 mutations. J Oral Pathol Med. 2022 Aug;51(7):659-665.
4- Franklin JRB, Vieira EL, Brito LNS, Castro JFL, Godoy GP. Epidemiological evaluation of jaw cysts according to the new WHO classification: a 30-year retrospective analysis. Braz Oral Res. 2021 Dec 6;35:e129.
5- Al Sheddi MA. Odontogenic cysts. A clinicopathological study. Saudi Med J. 2012 Mar;33(3):304-8.
6- Hatem M, Abdulmajid ZS, Taher EM, El Kabir MA, Benrajab MA, Kwafi R. Benign Orofacial Lesions in Libyan Population: A 17 Years Retrospective Study. Open Dent J. 2015 Dec 11;9:380-7.
7- Nayyer NV, Macluskey M, Keys W. Odontogenic Cysts - An Overview. Dent Update. 2015 Jul-Aug;42(6):548-51, 553-5.
8- Rojas L, Claudio C, Huamán C, Rojas G. Diagnosis and conservative treatment of odontogenic keratocyst: a case presentation, Odontoestomatología. 2022;24; 1- 8.
9- Abrahams JJ, Oliverio PJ. Odontogenic cysts: improved imaging with a dental CT software program. AJNR Am J Neuroradiol. 1993 Mar-Apr;14(2):367-74.
10- Johnson NR, Gannon OM, Savage NW, Batstone MD. Frequency of odontogenic cysts and tumors: a systematic review. J Investig Clin Dent. 2014 Feb;5(1):9-14.
11- El Gehani R, Krishnan B, Orafi H. The prevalence of inflammatory and developmental odontogenic cysts in a libyan population. Libyan J Med. 2008 Jun 1;3(2):75-7.
12- Goteti SH. Odontogenic Tumors: A Review of 675 Cases in Eastern Libya. Niger J Surg. 2016 Jan-Jun;22(1):37-40.
13- Arce K, Streff CS, Ettinger KS. Pediatric Odontogenic Cysts of the Jaws. Oral Maxillofac Surg Clin North Am. 2016 Feb;28(1):21-30.
14- WHO highlights oral health neglect affecting nearly half of the world's population, 18 November, News release Geneva Reading time: 3 min (833 wordsm. 2022.

15- Bhaskar SN. Oral pathology in the dental office: survey of 20575 biopsy specimens. J Am Dent Assoc 1968 ; 76(4) : 761 –766.
16- Daley TD, Wysocki GP, Pringle GA. Relative incidence of Odontogenic tumours and oral and jaw cysts in Canadian population. Oral Surg Oral Med Oral Pathol 1994 ; 77(3) : 276- 80.
17- Kochaji N, Alhessani S, Ibrahim S, Al-Awad A. Posterior mandibular glandular cyst: A rare case report. Int J Surg Case Rep. 2023 May;106:108169.
18- Ogunlewe MO, Odukoya O and Akinwande JA. Epithelial jaw cysts: analysis of 126 Nigerian cases. Afr Dent J 1996; 10 :1 – 8.
19- El Gehani R, Krishnan B and Orafi H, The Prevalence of Inflammatory and Developmental Odontogenic Cysts in a Libyan Population, Libyan Journal of Medicine,2016;3(2): 77 -75.
20- Mosqueda TA, Irigoyen MF, Diaz MA, Torres MA. Odontogenic cysts. Analysis of 856 cases. Med Oral. 2002; 7:89- 96.
21- Arotiba JT, Lawoyin JO, Obiechina AE. Pattern of occurrence of odontogenic cysts in Nigerians. East Afr Med J. 1998 Nov;75(11):664-6.
22- Jaya Singh, Shruti Singh, Shaleen Chandra, Fahad Samadi, Prevalence and Distribution of Odontogenic Cysts and Tumors in North Indian Population: A Database Study with Systematic Review, Int J Appl Biol Pharm 2020; 11 (2): 46-59.
23- Güven O, Keskin.A, Akal UK. The incidence of cysts and tumors around impacted third molars. Int J Oral Maxillofac Surg. 2000; 29(2):131-135.
24- Sixto-Requeijo R, Diniz-Freitas M, Torreira-Lorenzo JC, García-García A, Gándara-Rey JM. An analysis of oral biopsies extracted from 1995 to 2009, in an oral medicine and surgery unit in Galicia (Spain). Med Oral Patol Oral Cir Bucal. 2012 Jan 1;17(1):e16-22.
25- Villasis-Sarmiento L, Portilla-Robertson J, Melendez-Ocampo A, Gaitan-Cepeda LA, Leyva-Huerta ER. Prevalence and distribution of odontogenic cysts in a Mexican sample. A 753 cases study. J Clin Exp Dent. 2017 Apr 1;9(4):e531-e538. doi: 10.4317/jced.53627.
26- Karwasra K, Choudhary D, Astekar M, Gandhi N. Clinicopathological study of Odontogenic Cysts -a retrospective study, RUHS Journal of Health Sciences,2017; 2(1): 29 – 32.