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內文：

#### Abstract

1. A systematic review of the literature from 1993 to 2011 was undertaken examining frequency data of the most common odontogenic cysts and tumors.
2. There were 18297 odontogenic cysts reported. Among these cases, there were 9982 (54.6%) radicular cysts, 3772 (20.6%) dentigerous cysts and 2145 (11.7%) keratocystic odontogenic tumors.
3. With the reclassification of keratocystic odontogenic tumor in 2005 as an odontogenic tumor, there were 8129 odontogenic tumors reported with 3001 (36.9%) ameloblastomas, 1163(14.3%) keratocystic odontogenic tumors, 533 (6.5%) odontogenic myxomas, 337 (4.1%) adenomatoid odontogenic tumors and 127 (1.6%) ameloblastic fibromas.
4. This systematic review found that odontogenic cysts are 2.25 times more frequent than odontogenic tumors.

#### Introduction

1. Epidemiological data for odontogenic cysts and tumors have been reported extensively in the literature, with an emphasis on the more destructive lesions such as the keratocystic odontogenic tumor (KCOT) and ameloblastoma.
2. Odontogenic lesions can be divided discretely into cysts and tumors.
  - (1) cyst: an epithelial lined pathological cavity
  - (2) tumor: a solid tissue mass, not necessarily neoplastic
3. Odontogenic cysts:
  - (1) A radicular cyst is due to a long standing inflammatory process in the bone of the surrounding root apex with the proliferation of the epithelial rests of Malassez.
  - (2) Dentigerous cysts are developmental in origin, with fluid expanding the dental follicle peri-coronally.
  - (3) The KCOT arises from the dental lamina and other sources of odontogenic epithelium. This lesion tends to be more aggressive in its growth pattern, providing a higher recurrence rate than other odontogenic pathoses.
4. Odontogenic tumors:
  - (1) Ameloblastomas can be derived from any odontogenic epithelium ranging from the dental lamina ,to reduced enamel epithelium , to epithelial rests of Malassez and Serres , and possibly the basal layer of the overlying epithelium. Ameloblastomas can have a varied radiographic appearance.
  - (2) Odontogenic myxoma is an intraosseous neoplasm consisting of myxomatous fibrous extracellular matrix originating from mesenchymal remnants.
  - (3) Adenomatoid odontogenic tumors arise from the dental lamina in the gubernacular cord of developing permanent teeth.
  - (4) Ameloblastic fibromas are similar in origin to ameloblastomas, being derived from the enamel organ or dental lamina, except there is a lack of dental hard

tissue in the specimen.

- The aim of this study was to systematically review all papers between 1993 and 2011 that provided frequency data for odontogenic cysts and tumors.

**Methods**

A systematic review was conducted using the databases CENTRAL, MEDLINE, and EMBASE.

**Table 1.** Inclusion criteria

1	The paper must be full text and written in English
2	The paper must describe frequency or prevalence of odontogenic cysts or tumors
3	Papers must state which WHO classification system was used
4	Papers describing odontogenic cysts using the 1992 WHO classification must report data on radicular cyst, dentigerous cyst and KCOT
5	Papers describing odontogenic tumors must report data on ameloblastoma, odontogenic myxoma, adenomatoid odontogenic tumor and ameloblastic fibroma
6	Papers describing odontogenic tumors using the 2005 WHO classification must report data on ameloblastoma, KCOT, odontogenic myxoma, adenomatoid odontogenic tumor and ameloblastic fibroma
7	Papers had to report the total number of lesions collected over a specific time frame, along with the individual numbers of the various lesions

KCOT, keratocystic odontogenic tumor.

**Results**

- There were 5231 papers identified in the preliminary database search. Of these there were 10 papers that met the inclusion criteria that described odontogenic cysts.
- There were 12 papers that met the inclusion criteria that described odontogenic tumors. With the change of the WHO classification describing KCOT as a tumor in 2005, there was a subset of 4 papers that dealt with KCOT under the odontogenic tumor classification.
- All selected papers dealt with populations ranging from the 10~80.
- The total number of cysts or tumors reported in each paper was combined.

*Table2. Relative frequencies of selected odontogenic cysts*

Geographic location	Years of study	Total cysts	RC cases (%)	DC cases (%)	KCOT cases (%)
Mexico <sup>17</sup>	10	304	118 (38.8)	108 (35.5)	57 (18.7)
Mexico <sup>18</sup>	21	856	342 (39.9)	283 (33.0)	184 (21.5)
France <sup>20</sup>	10	695	372 (53.5)	154 (22.3)	133 (19.1)
Chile <sup>19</sup>	28	2944	1494 (50.7)	546 (18.5)	421 (14.3)
Brazil <sup>38</sup>	51	2812	1772 (61.0)	735 (25.3)	208 (7.2)
UK <sup>39</sup>	30	7121	3724 (52.3)	1292 (18.1)	828 (11.6)
Italy <sup>16</sup>	19	1273	1107 (84.5)	149 (11.4)	17 (1.3)
Brazil <sup>40</sup>	20	680	493 (72.5)	151 (22.2)	28 (4.1)
Iran <sup>15</sup>	20	1227	465 (37.9)	303 (24.7)	239 (19.5)
Kuwait <sup>41</sup>	6	385	95 (24.7)	51 (13.2)	30 (7.8)
<b>Total</b>		<b>18 297</b>	<b>9982 (54.6)</b>	<b>3772 (20.6)</b>	<b>2145 (11.7)</b>

RC, radicular cyst; DC, dentigerous cyst; KCOT, keratocystic odontogenic tumor.

*Table3. Relative frequencies of selected odontogenic tumors*

Geographic location	Years of study	Total number	AME cases (%)	OMY cases (%)	AOT cases (%)	AF cases (%)
Canada <sup>22</sup>	26	445	79 (13.5)	24 (5.4)	14 (3.1)	7 (1.6)
Mexico <sup>25</sup>	35	349	83 (23.7)	62 (17.7)	25 (7.1)	5 (1.4)
China <sup>34</sup>	42	759	445 (58.6)	64 (8.4)	63 (8.3)	14 (1.8)
Chile <sup>27</sup>	25	362	74 (20.4)	32 (8.8)	24 (6.6)	2 (0.6)
Estonia <sup>28</sup>	24	75	19 (25.3)	9 (12)	1 (1.3)	12 (16)
Nigeria <sup>29</sup>	33	319	201 (63)	21 (6.5)	24 (7.5)	6 (2)
Tanzania <sup>23</sup>	4	116	93 (80.1)	8 (7)	1 (0.9)	2 (1.7)
Nigeria <sup>30</sup>	19	318	233 (73)	38 (12)	9 (2.8)	10 (3)
Brazil <sup>35</sup>	51	340	154 (45.2)	31 (9.1)	13 (3.8)	6 (1.76)
Turkey <sup>36</sup>	32	527	133 (25.2)	83 (15.7)	11 (2)	8 (1.5)
India <sup>26</sup>	35	250	154 (61.6)	15 (6.0)	31 (12.4)	2 (0.8)
USA <sup>24</sup>	20	1088	127 (11.7)	24 (2.2)	19 (1.7)	17 (1.6)
<b>Total</b>		<b>4948</b>	<b>1795 (36.3)</b>	<b>411 (8.3)</b>	<b>235 (4.7)</b>	<b>91 (1.8)</b>

AME, ameloblastoma; OMY, odontogenic myxoma; AOT, adenomatoid odontogenic tumor; AF, ameloblastic fibroma.

Table4. Relative frequencies of selected odontogenic tumors---after KCOT reclassification.

Geographic location	Years of study	Total number	AME cases (%)	KCOT cases (%)	OMY cases (%)	AOT cases (%)	AF cases (%)
China <sup>37</sup>	52	1642	661 (40.3)	588 (35.8)	76 (4.6)	68 (4.1)	19 (1.2)
Libya <sup>1</sup>	17	148	33 (22.3)	52 (35.1)	5 (3.3)	4 (2.7)	2 (1.3)
Egypt <sup>31</sup>	15	82	34 (41.5)	16 (19.5)	7 (8.5)	3 (3.7)	2 (2.4)
China <sup>32</sup>	22	1309	478 (36.5)	507 (38.7)	34 (2.6)	27 (2)	13 (1)
<b>Total</b>		<b>3181</b>	<b>1206 (37.9)</b>	<b>1163 (36.6)</b>	<b>122 (3.8)</b>	<b>102 (3.2)</b>	<b>36 (1.1)</b>

KCOT, keratocystic odontogenic tumor; AME, ameloblastoma; OMY, odontogenic myxoma; AOT, adenomatoid odontogenic tumor; AF, ameloblastic fibroma.

The relative frequency of KCOT in these papers was higher (36.6%) than was reported when KCOT was classified as an odontogenic cyst (11.7%). This is most likely due to the smaller numbers of odontogenic tumors reported as opposed to odontogenic cysts and is not a true increase in frequency.

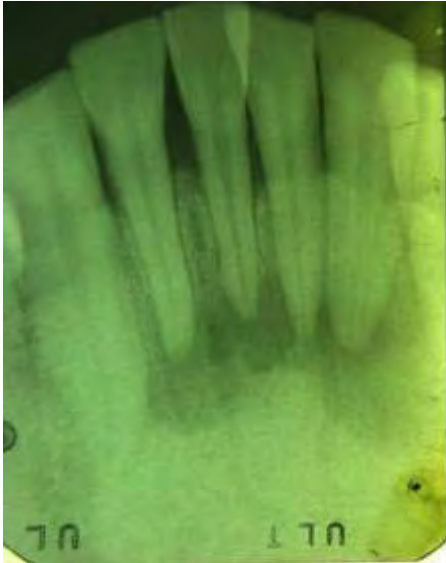
**Discussion**

1. The specific odontogenic cysts and tumors were chosen for this review as they were the most common lesions across the literature. This review has found that odontogenic cysts are 2.25 times more frequent than odontogenic tumors.
2. There were several different odontogenic cysts and tumors that were diagnosed less frequently, and these other terms were only a small proportion of the overall total. Not all studies reviewed had these other variants present, therefore no comparison could be made.
3. As odontogenic cysts and tumors are not notifiable to any cancer or diseases registry, it is difficult to ascertain whether any of the data published are truly accurate.
4. The reclassification of KCOT from a cyst to a tumor by the WHO in 2005 appears to have minimal influence on the frequency of other odontogenic tumors.

**Conclusion**

1. Radicular cysts are the most frequent odontogenic cyst, followed by the dentigerous cyst and KCOT (when classified as a cyst).

2. Ameloblastomas are the most frequent odontogenic tumor, followed by KCOT (when classified as a tumour), odontogenic myxoma, adenomatoid odontogenic tumor, and ameloblastic fibroma.

題號	題目
1	下列何種囊腫不屬於發育性囊腫？ (A) 含齒囊腫 (dentigerous cyst) (B) 原基性囊腫 (primordial cyst) (C) 根尖囊腫 (radicular cyst) (D) 戈林氏囊腫 (Gorlin cyst)
答案(C)	出處：Oral and Maxillofacial Pathology, 3 <sup>rd</sup> edition P.130 Epithelium at the apex of a nonvital tooth presumably can be stimulated by inflammation to form a true epithelium-lined cyst, or periapical cyst
題號	題目
2	在下顎正中門齒的X光片，有如圖所示之放射線透過區，門牙的活性測驗均為正常反應，最可能的診斷為： 
	(A) 根尖囊腫 (periapical cyst) (B) 腺樣齒源性囊腫 (glandular odontogenic cyst) (C) 造釉細胞瘤 (ameloblastoma) (D) 根尖牙骨質發育不良 (periapical cemento-osseous dysplasia)
答案(D)	出處：Oral and Maxillofacial Pathology, 3 <sup>rd</sup> edition P.641 Periapical cemento-osseous dysplasia : periapical radiograph showing multiple radiolucent lesions at the apices of the anterior mandibular teeth