

# Odontogenic cysts in children and adolescents: a 21-year retrospective study

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## Abstract

**Aim:** To investigate the distribution of odontogenic cysts in patients aged 0 to 18, referred to Department of Pathology, University Hospital of the Federal University of Maranhão, Brazil, to determine the most common types of lesions and their distribution according to gender and anatomical site involved. **Methods:** Histopathological data were collected from a database of lesions classified as odontogenic cysts that were indicated for surgical removal and histopathological analysis. Data were subjected to descriptive analysis. **Results:** Thirty cases of odontogenic cysts were identified, and dentigerous cysts were the most frequent (n=17). Most occurrences were in males (66.7%) and the most frequent site was the posterior mandible (73.3%). **Conclusions:** Odontogenic cysts in children and adolescents are mostly developmental cysts, especially dentigerous cysts, occurring predominantly in males, with a predilection for the posterior mandible.

**Keywords:** odontogenic cysts, child, adolescent.

## Introduction

Odontogenic cysts are pathological entities that correspond to cavities lined with epithelial tissue, containing in its interior semi solid or liquid material, whose formation is associated with proliferation of epithelial remnants of the enamel organ or even the development of embryonic processes maxillomandibular<sup>1</sup>.

These cysts constitute an important group of lesions in the maxillofacial complex, whose frequency varies from 7 to 13% of lesions diagnosed in this anatomic region<sup>2-3</sup>, affecting mainly the adult population<sup>2,4</sup>. These lesions are characterized by having slow growth and tendency to expand, despite the biological behavior of benign entities. However, odontogenic cysts can reach a considerable size if not diagnosed early and properly treated<sup>5</sup>. Because they are generally asymptomatic and some behave aggressively, this group of lesions has required special attention from dentists<sup>6</sup>.

Odontogenic cysts can be classified as to their etiology in inflammation and development, and are differentiated by histopathology, mainly because the clinical and radiographic characteristics are very similar. The differential diagnosis of these lesions includes cystic ameloblastoma, adenomatoid odontogenic tumor, odontogenic calcification cyst<sup>7</sup>.

It draws attention to the fact that several developmental processes occur in the maxillofacial area during childhood, including bone growth and odontogenesis,

Received for publication: September 22, 2011

Accepted: March 22, 2012

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which could be associated with cyst formation<sup>8</sup>. Nevertheless, the literature on odontogenic cysts includes studies mainly in the adult population, with few studies in children and adolescents. Considering these aspects, the purpose of this study was to investigate the distribution of odontogenic cysts in children and adolescents aged 0 to 18, referred to Department of Pathology of the University Hospital of the Federal University of Maranhão-UFMA, in São Luis, MA, Brazil, to determine the most common types of lesions and their distribution according to gender and anatomic site involved, since the occurrence of these lesions is poorly known in the study population.

## Material and methods

This study followed the fundamental scientific and ethical requirements of Resolution 196/96 (Standards for Research involving Human Subjects) of the Brazilian National Health Council, and was approved by the institutional Ethics Committee (protocol #33104-649/2007; approval #407/2007). This research consisted of a retrospective, cross-sectional, and descriptive study of medical records of children and adolescents referred to the Department of Pathology, University Hospital Presidente Dutra / UFMA, São Luis, MA, Brazil.

The sample included all medical records with a histopathologic diagnosis of odontogenic cyst, as defined by the Medical Subject Headings - Mesh, of patients aged 0 to 18 referred to the service above, diagnosed during the period from 1990 to 2010.

As a tool for collecting data, we used a database of lesions classified as odontogenic cysts that were indicated for surgical removal and histopathological analysis. Data regarding gender, patient age at the time of diagnosis, anatomical site involved and histopathologic diagnosis were investigated. Data were subjected to descriptive statistics and presented in tables.

## Results

Thirty cases of odontogenic cysts were found in children and adolescents aged 2 to 16. The males were the most affected (66.7%), as shown in Table 1. The predominant histopathological type was the dentigerous cyst (56.7%), followed by periapical cyst (20%), eruption cyst (6.7%) and odontogenic keratocystic tumor (3.3%), as shown in Table 2.

Regarding the origin, 66.7% were developmental cysts while 20% were inflammatory cysts. In addition, 13.3% of cysts could not be identified according to the methodology of this study (Table 3).

**Table 1** - Distribution of cases of odontogenic cysts according to gender. São Luís, MA-2010.

Gender	Number of cases	%
Male	20	66.7
Female	10	33.3
Total	30	100

Source: Department of Pathology, University Hospital - Unit Dutra / UFMA

**Table 2** - Distribution of cases of odontogenic cysts, in order of frequency. São Luís, MA-2010.

Type	Number of cases	%
Dentigerous cyst	17	56.7
Periapical cyst	06	20.0
Eruption's cyst	02	6.7
Odontogenic keratocystic tumor	01	3.3
Cysts of odontogenic nature	04	13.3
Total	30	100

Source: Department of Pathology, University Hospital - Unit Dutra / UFMA

**Table 3** - Distribution of cases of odontogenic cysts according to the origin. São Luís, MA-2010.

Origin	Number of cases	%
Development cyst	20	66.7
Inflammatory cyst	06	20.0
Not identified	04	13.3
Total	30	100

Source: Department of Pathology, University Hospital - Unit Dutra / UFMA

Concerning the anatomic site involved, the posterior mandible was the most frequently affected region (73.3%), followed by the anterior maxilla (16.7%), posterior maxilla (6.7%), and anterior mandible (3.3%) (Table 4).

**Table 4** - Distribution of cases of odontogenic cysts according to anatomical location. São Luís, MA-2010.

Anatomical location	Number of cases	%
Posterior mandible	22	73.3
Anterior maxillary	5	16.7
Posterior maxillary	2	6.7
Anterior mandible	1	3.3
Total	30	100

Source: Department of Pathology, University Hospital - Unit Dutra / UFMA

## Discussion

In the present study, the predominant histopathological type was the dentigerous cyst (56.7%), followed by periapical cyst, eruption cysts and odontogenic keratocystic tumor. The higher incidence of dentigerous cysts was also reported by some authors<sup>8-10</sup>. Prockt *et al.*<sup>11</sup> reinforced these data showing a frequency of 42.46% of dentigerous cysts in patients aged 10 to 19. This frequency can be explained by the large number of impacted third molars and canines in this age group, which are teeth associated with the etiology of these cysts.

Regarding the origin, the fact that most cysts were developmental cysts (66.7%) is in accordance with the literature, which shows a lower incidence of inflammatory cysts in children and adolescents<sup>8-9</sup>, unlike the adult population, which is more affected by cystic lesions of inflammatory origin<sup>5,12-13</sup>.

The difference in the distribution of odontogenic cysts among adults, children and adolescents, in particular developmental cysts, is probably due to the fact that the

origin of these lesions occurs during infancy and is associated with continued growth and subsequent changes in teeth, going to the end of puberty<sup>12</sup>. The occurrence of inflammatory cysts in permanent teeth are also infrequent in children and adolescents, since their pathogenesis starts from the pulp necrosis<sup>14</sup>, and recently erupted permanent teeth are generally healthy, not showing the condition necessary for the development of cystic lesion. In primary teeth, the inflammatory stimulus would not have enough time to act as a chronic irritant<sup>15-16</sup>.

Males were more affected (66.7%) and this result corroborates with the literature<sup>9-10</sup>. This finding can be explained by the fact that boys are usually more prone to trauma and have poorer oral hygiene than girls<sup>17</sup>. In contrast, Bodner<sup>8</sup> found no significant differences between genders in a sample of pediatric patients.

Regarding the anatomic site, the posterior mandible was the most frequently affected region, with 73.3% of cases, followed by the anterior maxilla (16.7%), as also observed by Godoy *et al.*<sup>9</sup>. Low incidence of lesions in the anterior mandible is probably due to the fact of the anterior teeth present less fissures and grooves than the posterior teeth, being less susceptible to caries and, consequently, to periapical inflammatory lesions<sup>9</sup>.

From the obtained results, it was possible to conclude that odontogenic cysts in children and adolescents are mostly developmental cysts, particularly dentigerous cysts, with a predominance of male patients and mostly located in the posterior mandible. The importance of the early diagnosis of these lesions by dentists is providing a better treatment for patients. Further research on this nature is needed, considering the scarcity of studies in this age group.

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