

Distribution of Pediatric Oral Pathologies in a Turkish Population Sample

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Article Info	ABSTRACT
Article History Received: 19.05.2025 Accepted: 30.07.2025 Published: 29.08.2025 Keywords: Oral pathology, Biopsy, Pediatric patients.	Aim: This study aims to retrospectively evaluate five years of oral biopsy results obtained from pediatric patients aged 0–16 in Konya, and to analyze the distribution of pathological findings by age and gender. Materials and Methods: In this retrospective study, biopsy samples collected from pediatric patients admitted to the Faculty of Dentistry at Necmettin Erbakan University between 2019 and 2024 were examined. A total of 84 patient records were reviewed. Histopathological diagnoses were obtained from archived pathology reports. Data were statistically analyzed using PSPP v2.0.0 software. Results: Of the 84 patients, 54.8% (n=46) were male and 45.2% (n=38) were female. The majority of cases occurred in the 13–16 age group (50.0%), while the fewest were in the 6–8 group (14.7%). The most common lesion group was cysts and pseudocysts (53.7%). Dentigerous cysts (28.6%), odontomas (20.2%), and radicular cysts (17.9%) were the most frequent diagnoses. In 8.3% of cases, no definitive pathological diagnosis could be established. Conclusion: The findings provide updated and region-specific data on the distribution of oral pathologies among the pediatric population in Konya. These results may contribute to improving early diagnosis and developing effective treatment strategies in pediatric dental care.

Türkiye’de Bir Pediatrik Popülasyonda Oral Patolojilerin Dağılımı

Makale Bilgisi	ÖZET
Makale Geçmişi Geliş Tarihi: 19.05.2025 Kabul Tarihi: 30.07.2025 Yayın Tarihi: 29.08.2025 Anahtar Kelimeler: Oral patoloji, Biyopsi, Çocuk hastalar.	Amaç: Bu çalışmanın amacı, Konya ilinde 0–16 yaş aralığındaki çocuk hastalardan alınan beş yıllık ağız içi biyopsi sonuçlarını retrospektif olarak değerlendirerek, elde edilen patolojik bulguların yaş ve cinsiyet dağılımına göre analiz edilmesidir. Gereç ve Yöntem: Bu retrospektif çalışmada, 2019–2024 yılları arasında Necmettin Erbakan Üniversitesi Diş Hekimliği Fakültesi’ne başvuran çocuk hastalardan alınan biyopsi örnekleri incelenmiştir. Toplam 84 hastanın biyopsi verileri değerlendirilmiş, histopatolojik tanımlar arşiv kayıtlarından elde edilmiştir. Veriler PSPP v2.0.0 programı kullanılarak istatistiksel olarak analiz edilmiştir. Bulgular: Çalışmaya dahil edilen hastaların %54,8’i erkek (n=46), %45,2’si kız (n=38) olup; en fazla vaka 13–16 yaş grubunda (%50,0), en az vaka ise 6–8 yaş grubunda (%14,7) gözlenmiştir. En sık rastlanan lezyon grubu kistler/pseudokistlerdir (%53,7). Dentigeröz kist (%28,6), odontoma (%20,2) ve radiküler kist (%17,9) en yaygın tanımlar arasında yer almıştır. Olguların %8,3’ünde ise tanı konulamamıştır. Sonuç: Elde edilen bulgular, Konya ilindeki pediatrik popülasyonda ağız içi patolojilerin dağılımına dair güncel ve bölgesel veri sunmaktadır. Bu verilerin, erken tanı ve uygun tedavi yaklaşımlarının geliştirilmesine katkı sağlayacağı düşünülmektedir.

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INTRODUCTION

Pathological lesions of the oral cavity exhibit considerable diversity and may arise from cystic, neoplastic, reactive, or systemic disease processes. While many of these lesions are located within the jawbones, they may also appear in soft tissue regions such as the gingiva, tongue, palate, buccal mucosa, and the floor of the mouth.^{1,2} Although clinically similar in appearance, oral lesions vary in origin, etiology, and biological behavior, necessitating distinct classification and management approaches.³

Some lesions can lead to significant clinical complications such as root resorption, tooth displacement, pain, or paresthesia. Others, including odontogenic keratocysts, are known for their high recurrence rates. Therefore, accurate diagnosis is essential not only for appropriate treatment planning but also for the preservation of systemic and oral health.⁴

In pediatric patients, biopsy serves as a critical diagnostic tool for identifying various oral lesions. The histopathological evaluation of biopsy specimens from children plays a vital role in enhancing early detection strategies and in improving pediatric oral healthcare outcomes.^{5,6}

Despite the importance of this topic, comprehensive studies focusing on oral pathological lesions in the pediatric population remain limited in Türkiye. One of the few large-scale studies was conducted by Gültekin et al.,⁷ who evaluated 472 oral biopsy specimens obtained from children aged 0 to 15 over an eight-year period. However, considering the two-decade interval since that publication, it is plausible that the distribution patterns of such lesions may have changed, particularly due to environmental, dietary, or socio-economic shifts.

The present study aims to retrospectively evaluate oral biopsy results obtained over a five-year period from pediatric patients aged 0 to 16 in the province of Konya, Türkiye. The hypothesis (H1) of this study is that cystic lesions are the most prevalent type of oral pathology among children aged 0 to 16 years, and that their frequency increases with age. By providing up-to-date, region-specific epidemiological data, this study seeks to contribute to the body of knowledge required for the development of improved diagnostic and treatment strategies in pediatric dentistry.

MATERIAL AND METHODS

This study was conducted as a retrospective, cross-sectional analysis of pediatric oral biopsy records. The patient population consisted of children aged 0 to 16 who underwent oral biopsy procedures at the Department of Pediatric Dentistry, Necmettin Erbakan University Faculty of Dentistry, between January 2019 and April 2024. A total of 84 patients were included based on the availability of complete demographic and histopathological data.

Data were extracted from institutional archives and included patient age, gender, biopsy site, clinical diagnosis, and final histopathological diagnosis. To ensure confidentiality, all personal identifiers were removed, and each patient was assigned a unique code. Ethical approval for the study was obtained from the Necmettin Erbakan University Ethics Committee (Approval No: 2025/617), and all procedures were conducted in accordance with the Declaration of Helsinki.

Oral lesions were identified during routine clinical and radiographic examinations performed by pediatric dentists. Indications for biopsy included persistent swellings, radiolucent or radiopaque lesions

on radiographs, unexplained mucosal abnormalities, or failure of lesions to resolve with conventional treatment. Surgical excision of the lesions was carried out by the Department of Oral and Maxillofacial Surgery under local anesthesia and standard aseptic protocols.

The excised tissue specimens were immediately fixed in 10% neutral-buffered formalin and transported to the Department of Pathology, Necmettin Erbakan University, Faculty of Medicine. Histopathological processing included paraffin embedding, sectioning, and hematoxylin-eosin (H&E) staining. When necessary, additional histochemical or immunohistochemical analyses were conducted using markers such as Calretinin, P63, P40, CD31, CD68, Cytokeratin 19, Pan-cytokeratin, and EVG, to support definitive diagnosis.

All slides were reviewed by board-certified pathologists experienced in oral and maxillofacial pathology. Diagnoses were categorized into lesion groups such as cystic, neoplastic, reactive/inflammatory, and non-diagnostic cases. These data were entered into a structured digital database for further analysis.

Statistical analysis was performed using PSPP version 2.0.0 (Free Software Foundation, Boston, MA, USA). Descriptive statistics-including frequencies, percentages, and mean values-were used to summarize the data. The statistical power of the study was

calculated using GPower version 3.1 (Heinrich Heine University, Düsseldorf, Germany). Based on the odontoma prevalence reported by Yasothkumar et al.¹³ in a South Indian pediatric population (15.8%), we conducted a goodness-of-fit power analysis using G*Power version 3.1. Assuming a medium effect size ($w = 0.3$), five lesion categories, and an alpha level of 0.05, the minimum required sample size to achieve 80% statistical power was calculated as 122. Given that the present study included 84 patients, the achieved power was approximately 57.7%. Although this value is below the conventional threshold, the sample size still allows for meaningful exploratory interpretation of regional lesion patterns. Categorical variables, such as lesion type, patient age group (e.g., 6–8, 9–12, and 13–16 years), and gender, were compared using Pearson's chi-square test. For continuous variables, non-parametric tests (e.g., Mann–Whitney U or Kruskal–Wallis tests) were employed where appropriate. Statistical significance was set at a p-value less than 0.05.

RESULTS

A total of 84 pediatric patients aged between 6 and 16 years were included in the present study. The mean age of the cohort was 12.2 years. Among these patients, 46 (54.8%) were male and 38 (45.2%) were female. A detailed overview of the age and gender distribution is presented in Table 1.

Table 1: Patient distribution by age group and gender

Age Group (years)	Male (n)	Female (n)	Total (n)	% of Total	Lesion Count (n)
6–8	7	3	10	14.7%	10
9–12	18	6	24	35.3%	24
13–16	22	12	34	50.0%	34

Pearson's chi-square test ($p > 0.05$).

The highest proportion of cases (n=34, 50.0%) was observed in the 13–16 age group, followed by the 9–12 group (n=24, 35.3%) and the 6–8 group (n=10, 14.7%). As each patient contributed one biopsy specimen, the lesion counts mirrored the demographic distribution.

Histopathological evaluation revealed that the most prevalent lesion category was

Table 2: Frequency of histopathological diagnoses

Lesion Type	n	%
Dentigerous cyst	24	28,6%*
Odontoma	17	20.2%
Radicular cyst	15	17.9%
No diagnosis	7	8.3%
Central giant cell granuloma	3	3.6%
Pyogenic granuloma	3	3.6%
Peripheral giant cell granuloma	2	2.4%
Odontogenic keratocyst	2	2.4%
Ossifying fibroma	2	2.4%
Ameloblastic fibroma	2	2.4%
Mucocele	2	2.4%
Granulation tissue	1	1.2%
Fibroma	1	1.2%

Kruskal–Wallis test ($p < 0.05$). * Statistically significant.

Among the specific diagnoses, dentigerous cysts emerged as the most frequently encountered lesion type, constituting 28.6% of the total cases (n=24). Odontomas (n=17, 20.2%) and radicular cysts (n=15, 17.9%) also represented significant proportions of the observed pathology. Less commonly diagnosed entities included pyogenic granulomas, central and peripheral giant cell granulomas, odontogenic keratocysts, ossifying fibromas, and

cysts and pseudocysts, accounting for 53.7% of all cases (Table 2). This group was followed by tumors and tumor-like lesions (26.9%), and inflammatory or reactive lesions (9.0%). Notably, in 8,3% of cases, the biopsy material was either insufficient or lacked diagnostic clarity, resulting in inconclusive histopathological outcomes.

ameloblastic fibromas, each comprising between 1.2% and 3.6% of the total sample.

Importantly, a progressive increase in lesion frequency was noted with advancing age, peaking in the 13-16 year group. This observation may reflect developmental and odontogenic dynamics that contribute to the pathogenesis or detectability of certain lesions, particularly odontogenic cysts and mixed odontogenic tumors such as odontomas.

Considering the predominance of dentigerous cysts and the observed increase in lesion frequency with age, the findings of this study support the proposed hypothesis (H1).

DISCUSSION

The distribution of oral pathological lesions in pediatric populations is a dynamic phenomenon influenced not only by biological factors, but also by environmental, cultural, and regional determinants. In this context, retrospective evaluations provide invaluable insight, particularly in mapping regional disease patterns and supporting clinical decision-making processes. The present study represents the first comprehensive retrospective analysis of oral biopsy specimens in pediatric patients from the city of Konya, Türkiye, spanning a five-year period. The findings contribute substantially to the existing national and international literature by offering updated, region-specific data.

Our results demonstrated that cysts and pseudocysts were the most commonly diagnosed lesion group, accounting for 53.7% of cases. This finding aligns with the results reported by Cavalcante et al. in Brazil⁸ and Gültekin et al. in Türkiye,⁷ both of which identified cystic lesions as the predominant pathological category among children. Comparable trends have been observed in studies from Taiwan⁹ and South Africa,¹⁰ reinforcing the notion that odontogenic cysts constitute a globally prevalent entity in pediatric oral pathology.

The dentigerous cyst emerged as the most frequent individual diagnosis in our study, comprising 28.6% of all cases. This observation is consistent with findings from Chen et al.¹¹ and more recently Melo et al.¹² who identified dentigerous cysts as the

leading intraosseous pathology in children and adolescents. The relatively high frequency of dentigerous cysts in the present study (28.6%) may be attributed to multiple factors, including widespread use of panoramic radiography in routine dental assessments, increased awareness among clinicians regarding impacted teeth, and referral patterns favoring surgical intervention in tertiary care centers. In the Turkish context, comparable prevalence rates have been reported by Gültekin et al.⁷ and Işık et al.¹⁵ as well as a more recent study by Eninanç and Mavi,¹⁶ who analyzed 95 cases of dentigerous cysts using CBCT and observed similar demographic and radiological characteristics. This regional alignment suggests that early detection practices, expanded imaging access, and specialist care dominate diagnostic rates of these often asymptomatic lesions. These cysts are typically asymptomatic and discovered incidentally through radiographic imaging; however, in certain cases, they may exert pressure on adjacent structures, leading to clinically significant complications.

Odontomas represented the second most common lesion group in our sample (20.2%). These developmental anomalies, composed of enamel, dentin, and cementum-like tissues, are often detected radiographically due to delayed tooth eruption. The prevalence of odontomas in our study slightly exceeded that reported by Yasothkumar et al. (15.8%) in a South Indian pediatric population,¹⁴ indicating a possible regional variation.

Age-stratified analysis revealed a marked increase in lesion frequency with age, with the 13–16 age group comprising 50.0% of all cases. This trend may reflect heightened odontogenic activity and increased clinical surveillance during adolescence. Our findings

are in agreement with those of Yalçın and Bozan¹⁴ who reported similar age-related patterns in lesion prevalence.

Importantly, 8,3% of the biopsy specimens in our study did not yield a definitive pathological diagnosis. This may be attributed to insufficient tissue samples, suboptimal fixation, or the presence of histologically ambiguous features. A comparable nondiagnostic rate (8.3%) was reported by Melo et al. in their Brazilian cohort.¹²

Collectively, the data from this study provide a timely epidemiological snapshot of oral pathologies in the pediatric population of central Türkiye. The consistency of our findings with prior research from diverse geographic regions⁸⁻¹⁵ reinforces the reliability of these patterns and highlights the need for routine histopathological evaluation in the management of oral lesions in children and adolescents. These insights may serve to guide clinicians, inform health policy, and support curriculum development in pediatric dental education.

While this study offers valuable insight into the histopathological profile of pediatric oral lesions in a regional cohort, several limitations must be acknowledged. First, the retrospective design inherently limits the control over data completeness and quality, as it relies solely on existing records. Second, the study was conducted at a single center, which may restrict the generalizability of the findings to broader populations. Third, a non-negligible proportion of cases (8.3%) yielded non-diagnostic results, likely due to inadequate biopsy material or suboptimal processing. Additionally, due to the lack of prior local data, the power analysis was conducted using lesion prevalence rates reported by Bhosale et al.¹³ as a model reference. While this approximation supports

a preliminary interpretation of statistical adequacy, it does not fully account for regional variability. Therefore, future studies incorporating multi-center, prospective methodologies with standardized biopsy protocols and larger samples are recommended to validate and expand upon these findings.

This retrospective analysis offers region-specific data on pediatric oral pathologies from a central Anatolian population and contributes to the existing national literature. By documenting lesion types and frequencies in a defined cohort, the study may help inform diagnostic approaches and support clinical decision-making, particularly in cases involving asymptomatic or radiographically identified lesions in children.

CONCLUSION

This study presents a comprehensive retrospective analysis of oral biopsy specimens from pediatric patients in the city of Konya, providing valuable insights into the prevalence and distribution of oral pathological lesions in children and adolescents. Cysts and pseudocysts, particularly dentigerous cysts, emerged as the most frequent lesions, followed by odontomas and radicular cysts. The frequency of lesions was found to increase with age, peaking during adolescence.

The results of this study are consistent with national and international findings and underscore the importance of histopathological evaluation in pediatric patients presenting with oral lesions. Early recognition and accurate diagnosis of these pathologies are essential to prevent potential complications and to guide appropriate treatment strategies.

These findings may serve as a regional reference for clinicians and researchers, and highlight the need for broader, multi-center studies to further explore the epidemiology of oral diseases in pediatric populations across different geographic and socioeconomic contexts. In addition to its descriptive findings, this study provides updated data from a central region of Türkiye, which has been relatively underrepresented in the pediatric oral pathology literature. Such data may offer a valuable foundation for future epidemiological comparisons and contribute to improved awareness of regional variations in lesion prevalence and distribution.

Ethical Approval

Ethical approval for the study was obtained from the Necmettin Erbakan University Ethics Committee (Approval No: 2025/617), and all procedures were conducted in accordance with the Declaration of Helsinki.

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Conflict of Interest

The authors deny any conflicts of interest related to this study.

Author Contributions

Design: ET, HÖÜ, Data collection or access: SF, AE, ET, Analysis and comments: ET, HÖÜ, Literature search: ET, Writing: ET, HÖÜ.

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