Oral soft tissue lesions in Greek children and adolescents: a retrospective analysis over a 32-year period

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Pediatric oral pathology encompasses a wide clinical spectrum of local and systemic diseases. The purpose of this study was to evaluate the clinical characteristics of oral soft tissue lesions in Greek children and adolescents up to 18 years old. Data available through a 32 year old period revealed that among the 1040 cases analyzed, benign lesions, mainly cysts, inflammatory lesions and reactive hyperplasias, were the most common causes for seeking dental advice during childhood.
J Clin Pediatr Dent 29(2): 175-178, 2005.

INTRODUCTION

Pediatric soft tissue lesions of the oromaxillofacial area encompass a wide variety of local and systemic disorders, thus stressing the importance of correct diagnosis and prompt treatment.[1] The relevant studies published so far are few and showed equivocal results probably because of the different criteria used, which mainly concerned the age range, the type of lesions, as well as the geographic and endemic differences between the countries enrolled in the study.[2-18]

The purpose of this investigation was to critically evaluate the clinical characteristics of oral soft tissue lesions in Greek children and adolescents up to 18 years old, with regard to the most prevalent causes that urged patients to seek dental advice.

MATERIALS AND METHODS

Data that served as the basis of this study derived from the records of the Oral Pathology Department of the University of Athens, Dental School during a 32-year period (1970-2002). All histopathological reports and related biopsy request forms regarding children and adolescents with age less than 18 years and a diagnosis of a soft tissue lesion, were re-examined. Retrieved data were analyzed in terms of gender, age, location, clinical diagnosis and type of lesions. According to the diagnosis lesions were classified into the following categories: cystic lesions, benign tumor or tumor like lesions, inflammatory reactions, neoplasms and miscellaneous lesions.

Greek children belong to a homogeneous, white Caucasian population with only rare occurrence of miscegenations. The Oral Pathology Department of the Dental School, is located in Athens, the capital of Greece and is in collaboration with the Pediatric Hospitals located in close vicinity; hence it handles a significant proportion of the submitted pediatric oral biopsies.

RESULTS

Review of the files of the Department of Oral Pathology over a 32-year period (between 1970 and 2002), revealed 1040 cases of soft tissue lesions in children and adolescents up to 18 years of age, which represented 5.2% out of a total number of 19,933 biopsies received.

Age ranged between one month to 18 years of life with a mean age at referral of 13.83 years. Males presented seeking dental help later than females (mean age 15.5 years compared to 12.2 years). An equal gender predilection was observed with a male to female ratio 1:1.

The great majority of the lesions were benign representing 98.5% of all cases, in contrast to malignant neoplasms which were rare (1.5%) (Figure 1). In most cases, clinical diagnosis was in accordance with the final histopathological interpretation.

Data available from 770 cases (74% of the 1040 cases) showed that the lesions most frequently developed on the gingival mucosa of both jaws with

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Figure 1. Oral soft tissue lesions in Greek children and adolescents.

Lesions	Cases	Percentage (%)	Most common lesion	Number of cases and percentage among the 1040 cases	
Cysts	400	38.4	Mucous extravasation cyst	305 cases	**29.30%**
Reactive lesions of connective tissue	223	21.45	Traumatic fibroma	97 cases	**9.32%**
Benign lesions of vascular origin	187	18	Pyogenic granuloma	158 cases	**15.00%**
Inflammatory lesions	71	6.82	Chronic gingivitis	46 cases	**4.42%**
Giant cell lesions	69	6.63	Peripheral giant cell granuloma	69 cases	**6.63%**
Benign tumors of epithelial origin	4	0.4%	Verruca vulgaris	4 cases	**0.40%**
Benign neoplasms	55	5.2	Squamous papilloma	37 cases	**3.50%**
Malignant neoplasms	15	1.5	SCC, Sarcoma, lymphomas, mucoepidermoid carcinoma equally	3 cases each,	**0.30%**
Congenital disorders	10	1%	Congenital gingival enlargement	10 cases	**1.00%**
Autoimmune diseases	6	0.6	Lichen planus/cGVHD	2 cases each	**0.20%**
TOTAL	1040	100%			

equal distribution (350 cases, 45.5%), followed by the lower lip (229 cases, 30%), the tongue (93 cases,12%), the buccal mucosa (48 cases, 6%), the floor of the mouth (18 cases, 2.25%), the palate (18 cases, 2.25 %) and the upper lip (14 cases, 2%) (Figure 2).

Overall, lesions of inflammatory and traumatic origin represented the vast majority (79.5%) of soft tissue lesions and included 305 cases of mucous extravasation cysts, 450 cases of reactive tissue hyperplasias and 71 inflammatory reactions.

Soft tissue cystic lesions consisted of 400 cases, while the mucous extravasation cyst (305 cases) had the higher incidence (38.46%) (Figure 1).

Soft tissue reactive hyperplasias consisted of 450 lesions, (43% out of the 1040 cases). These included 158 cases of pyogenic granuloma, 97 traumatic fibromas, 69 peripheral giant cell granulomas, 61 peripheral ossifying fibromas, 41 cases of fibrous hyperplasia, 21 giant cell fibromas, 2 cases of fibromyxoma and one case of fibrous histiocytoma (Figure 3).

More specifically and based on the tissue of origin, reactive tumor or tumor-like lesions of the connective tissue represented 21.45% (223 cases) with the traumatic fibroma being the most prevalent, followed by the peripheral ossifying fibroma. Lesions of vascular origin made up 18% of the cases and pyogenic granuloma was the lesion most frequently observed (84.5%), while congenital malformations like hemangiomas and lymphangiomas were only rare. Giant cell lesions represented 6.63% of all cases, while benign tumors of epithelial origin accounted for 0.4%, including only 4 cases of verruca vulgaris (Figure 1).

Inflammatory reactive lesions represented 6.82% of the cases, mainly including chronic gingivitis, pulp polyps, drug-induced gingival enlargements and traumatic ulcerations.

True neoplasms and precancerous lesions were only 70 (6.7% of the total cases), the majority of them being benign (78.5%). Squamous papilloma was the most common benign lesion. Malignant neoplasms accounted for the 21.5% of neoplasms and included 3 oral squamous cell carcinomas, 3 non Hodgkin lymphomas, 3 mucoepidermoid carcinomas, 3 sarcomas, 1 metastatic neuroblastoma, 1 rhinopharyngeal carcinoma and one case of idiopathic leukoplakia (Figure 4).

Miscellaneous lesions, including genetic disorders such as congenital gingival fibromatosis (10 cases), as well as autoimmune diseases, which comprised 2 cases of lichen planus, 2 cases of chronic graft versus host disease and one case of benign pemphigoid and pemphigus vulgaris, were also found (Figure 1).

DISCUSSION

Pediatric soft tissue lesions of the oral cavity and related structures represent a heterogenous group of pathological conditions, ranging from true neoplasms to congenital disorders and inflammatory diseases.[1]

Despite the considerable number of relevant studies in the literature, results are often ambiguous mainly in virtue of the differences in the criteria used with regard to age range, type and site of lesions and the diverse

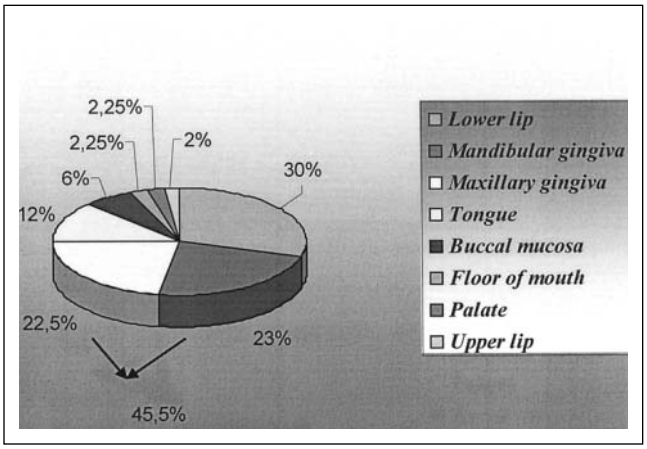

Figure 2. Location of soft tissue lesions in 770 cases.

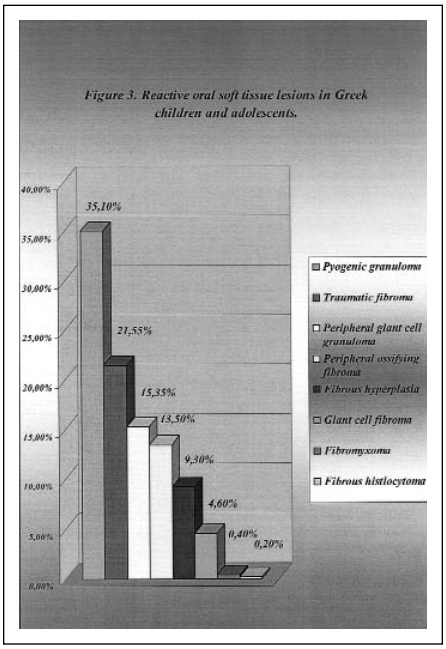

Figure 3. Reactive oral soft tissue lesions in Greek children and adolescents.

Figure 4. Oral soft tissue neoplasms in Greek children and adolescents.

NEOPLASMS	*TYPE OF NEOPLASM*		*CASES*	*PERCENTAGE*
BENIGN NEOPLASMS	**Epithelial neoplasms**	Squamous papilloma	37	
		Pleomorphic adenoma	3	
	Lipoma		6	
	Neoplasms of peripheral nerves	Neurofibroma	3	
		Shwannoma	2	
		Von Recklinghausen's disease	1	
	Melanotic nevi		2	
	Congenital epulis of infancy		1	
Total cases and percentage of benign neoplasms			***55***	***78.5%***
MALIGNANT NEOPLASMS and PRECANCEROUS LESIONS	**Squamous cell carcinoma**		3	
	Mucopepidermoid carcinoma		3	
	Sarcoma		3	
	Non Hodgkin lymphoma		3	
	Metastatic neuroblastoma		1	
	Rhinopharyngioma		1	
	Idiopathic leukoplakia		1	
Total cases and percentage of malignant neoplasms			***15***	***21.5%***
TOTAL CASES OF NEOPLASMS			***70***	***100.0%***

racial and endemic characteristics of the (reporting) countries implicated.[2-18]

In this study, 1040 oral soft tissue lesions in children and adolescents under the age of 18 years were evaluated out of a total of 19,933 biopsies submitted at the Oral Pathology Department of the University of Athens, Dental School between the years 1970 and 2002 (5.2%). This percentage is in agreement with the results of other studies,

despite the different parameters used, according to which pediatric lesions do not exceed the 10% of the total number of files at the various pathology services, a fact underlining the low prevalence of childhood lesions in the general population.[5,9,10,15,17,18] The results of this study also point to the great diversity of oral pediatric lesions, that extend from reactive hyperplasias and inflammatory reactions to neoplasms, genetic disorders and autoimmune diseases.[1-23]

Lesions of inflammatory and traumatic origin accounted for the vast majority of soft tissue lesions in Greek children and adolescents beyond the age of 18 years, representing the most common cause for seeking dental advice during childhood.[5,6,15,18]

Most of these lesions developed on the gingival mucosa, indicating the involvement of tooth pathology and status of dentition in the pathogenesis of at least some of them, while the lower lip was the site most commonly involved by mucous extravasation cysts.

Mean age at referral was 13.85 years, which is slightly elder than previously reported. This declination towards the elder age groups, might be explained by the age prevalence characteristics of the most commonly found lesions. Reactive lesions are known to be rare beyond the age of 10 years, while the high incidence of mucous extravasation cyst in this age group could be related to the traumatogenic school environment, since at this age children are more prone to accidents due to athletic activities.

Benign lesions accounted for 98.5% of the 1040 lesions with the remaining 1.5% representing malignant neoplasms.[1-10,15,16] Other studies however reported a higher prevalence of malignant lesions in children, which was probably influenced by the endemic character of certain neoplasms such as Burkitt's lymphoma.[11,12] True soft tissue neoplasms, especially malignant, are scarce in childhood according to the results of this study which is in agreement with other surveys.[20,21] Still they may mimic the clinical appearance of benign lesions and therefore they should be considered in the differential diagnosis of cases with abrupt, rapid growth or asymmetric enlargements and ulcerations with unidentified local irritants.[1]

Lesions of genetic aetiology, such as congenital gingival fibromatosis, must also be considered in the differential diagnosis of generalized gingival enlargement.[1]

Oral lesions that conceal underlying systemic disorders like autoimmune diseases, although rare they may be a part of pediatric oral pathology. Lichen planus, benign pemphigoid, pemphigus vulgaris and graft versus host disease after bone marrow transplantation should be kept in mind in cases of erosive or white striae's clinical lesions or in cases with profound xerostomia.[24,25]

In conclusion, the results of this study come to confirm previous reports of pediatric oral pathology, which revealed that lesions of inflammatory or traumatic nature are the most common causes for seeking dental advice during that childhood. Malignant neoplasms and systemic diseases, although rare, they may also be part of pediatric pathology. Full completion of the medical records and careful evaluation of the prominent clinical characteristics along with histopathological examination in cases needed, will ensure correct diagnosis and appropriate therapeutic intervention.

REFERENCES

1. Flaitz CM, Coleman GC. Differential diagnosis of oral enlargements in children. Pediatr Dent 17: 294-300, 1995.
2. Tanaka N, Murata A, Yamaguchi A, Kohama G. Clinical features and management of oral and maxillofacial tumors in children. Oral Surg Oral Med Oral Pathol Oral Radiol Oral Endod 88: 11-15, 1999.
3. Sousa FB, Etges A, Correa L, Mesquita RA, de Araujo NS. Pediatric oral lesions: a 15-year review from Sao Paulo, Brazil. J Clin Pediatr Dent 26: 413-418, 2002.
4. Sato M, Tanaka N, Sato T, Amagas T. Oral and maxillofacial tumors in children: a review. Br J Maxillofac Surg 35: 92-95, 1997.
5. Chen YK, Lin LM, Huang HC, Lin CC, Yan YH. A retrospective study of oral and maxillofacial biopsy lesions in a pediatric population from southern Taiwan. Pediatr Dent 20: 404-410, 1998.
6. Das S, Das AK. A review of pediatric oral biopsies from a surgical pathology service in a dental school. Pediatr Dent 15: 208-211, 1993.
7. Skinner RL, Davenport WD, Weir JC, Carr RF. A survey of biopsed oral lesion in pediatric dental patients. Pediatr Dent 8: 163-167, 1986.
8. Maia DM, Merly F, Castro WH, Gomez RS. A survey of oral biopsies in Brazilian pediatric patients. J Dent Child 83: 128-131, 2000.
9. Kezler A, Gugliemotti MB, Dominguez FV. Oral pathology in children, frequency, distribution and clinical significance. Acta Odontol Latinoam 5: 39-48, 1990.
10. Maaita JK. Oral tumors in children: a review. J Clin Ped Dent 24: 133-135, 2000.
11. Godwin TA. A study of orofacial tumors in Nigerian children. J Oral Maxillofac Surg 54: 34-38, 1996.
12 Arotiba GT. A study of orofacial tumors in Nigerian children. J Oral Maxillofac Surg 54: 34-39, 1996.
13. Kalyanyama BM, Matee MIN, Vuhahula E. Oral tumors in Tanzanian children based on biopsy materials examined over a 15-year period from 1982 to 1997. Int Dent J 52: 10-14, 2002.
14. Al-Khateeb T, Hamasha AH, Almasri NM. Oral and maxillofacial tumors in North Jordanian children and adolescents: a retrospective analysis over 10 years. Int J Oral Maxillofac Surg 32: 78-83, 2003.
15. Ulmansky M, Lustmann J, Balkin N. Tumors and tumor-like lesions of the oral cavity and related structures in Israeli children. Int J Oral Maxillofac Surg 28: 291-294, 1999.
16. Taiwo EO, Salako NO, Sote EO. Distribution of oral tumors in Nigerian children based on biopsy materials examined over a 11-year period. Comm Dent Oral Epidemiol 18: 200-203, 1990.
17. Gultelkin SE, Tokman B, Turkseven MR. A review of paediatric oral biopsies in Turkey. Int Dent J 53: 26-32, 2003.
18. Rapidis AD, Economidis J, Goumas I et al. Tumours of the head and neck in children. A clinicopathological analysis of 1007 cases. J Craniomaxillofac Surg 16: 279-286, 1988.
19. Bhaskar SN. Oral tumors of infancy and childhood: a survey of 293 cases. J Pediatr 63: 195-210, 1963.
20. Cunningham MJ, Myers EN, Bluestone CD. Malignant tumors of the head and neck in children: a twenty-year review. Int J Pediatr Otorhinolaryngol 13: 279-292, 1987.
21. Jaffe BF. Pediatric head and neck tumors: a study of 187 cases. Laryngoscope 51: 731-739, 1973.
22. Jones JH. Non-odontogenic oral tumors in children. Br Dent J 119: 439-447, 1965.
23. Koch H. Statistical analysis of tumors of the head and neck in infancy and childhood. J Maxillofac Surg 2: 26-31, 1974.
24. Laskaris G, Sklavounou A, Angelopoulos A. Juvenile pemphigus vulgaris. Oral Surg 51: 415-419, 1980.
25. Laskaris G, Triantafyllou A, Economopoulou P. Gingival manifestations of childhood cicatricial pemphigoid. Oral Surg Oral Med Oral Pathol 66: 349-353, 1988.