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Original article

Prevalence, Characteristics, and Distribution of Oral and Maxillofacial Lesions in the Libyan Population of Benghazi- A Ten-Year Retrospective Study

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Abstract
The oral and maxillofacial region can be affected by a variety of medical conditions, ranging from mild inflammatory conditions to true benign and malignant neoplasms. This study aimed to provide a systematic analysis of oral and maxillofacial lesions in a Libyan population over a decade, and to compare the results with the reports from other countries. The patient's records were retrieved from the Department of Oral Medicine, Oral Pathology, Diagnosis, and Radiology's archive and reviewed during the period from 2010 to 2019. Patient demographic information (age and sex) and lesion location were recorded and analysed. During the period of study, a total of 593 biopsies were confirmed as oral and maxillofacial lesions, showing a male-to-female ratio of 0.8:1, and a mean age of 38.66±18.137 years. The non-neoplastic lesions accounted for much of the sample (79%), with the reactive and inflammatory lesions being the most observed. Among the neoplastic lesions, benign non-odontogenic tumours constituted 39.7% of the total, primarily in the form of squamous cell papilloma. Odontogenic tumours were less common (17.46%), with the ameloblastoma being the most frequently observed type. Malignant tumours constituted about 8.9% of the total biopsies, with squamous cell carcinoma being the most common, accounting for 5.4% of all the lesions. In conclusion, most of the oral and maxillofacial lesions during the study period were non-neoplastic in nature, mainly affecting middle-aged women, with fibroepithelial polyp and radicular cyst being the most frequent diagnoses.
Keywords: Maxillofacial, Odontogenic, Neoplasms, Reactive, Malignant.

Introduction

Oral and maxillofacial lesions can be defined as any pathological alteration in colour, surface aspect, or loss of integrity of the oral and maxillofacial complex. This ranges from a mild inflammatory or reactive overgrowth, which requires minimal or even no medical intervention, to a true benign or malignant neoplasm calling for a more radical or invasive treatment [1]. There are many causes of oral lesions, though the clinical and radiographic presentation of some of them may be almost identical and pose diagnostic challenges for oral health professionals. For such lesions, biopsy and histopathological examination are essential for accurate diagnosis and hence a more suitable treatment [2].

The etiology and distribution of oral and maxillofacial lesions are widely variable, and may show a great propensity to a specific patient's gender and age group, as well as a particular anatomical site. Thus, a good knowledge and understanding of these variables is substantial for dentists and health care providers for appropriate patient management [3]. This will subsequently improve patient well-being, as many of these lesions disrupt patient quality of life by causing, e.g., pain, deformity, and even malnutrition by interfering with mastication. In addition, a substantial proportion of oral and maxillofacial lesions are classified as life-threatening conditions that should be carefully approached [4].

Worldwide, research has been conducted to investigate the prevalence of dental caries and periodontal diseases; however, studies considering oral and maxillofacial pathology are relatively scanty, particularly those based on the histopathological diagnosis and included patients of all ages. In fact, most of the studies were conducted on adult patients [5,6]. and many of them relied solely on clinical screening [7], while those considering the histopathological diagnosis and included patients of all ages were generally scarce [8]. At the same time, many of these studies were conducted to relate oral lesions to a particular systemic disease [9,10] or a specific social habit [11,12].

In Libya, such epidemiological studies are almost lacking, and to our knowledge, no research has been conducted while considering the histopathological diagnosis of the lesions. This prompted the current study, which aims to investigate the prevalence and characteristics of biopsied oral and maxillofacial lesions in the Libyan population of Benghazi, and to correlate the results to different parameters, including patient demographics and the specific anatomical site of the lesion. The results of this study will then be compared with those from other countries.

Methods

Study design

A cross-sectional retrospective review of all the cases that were biopsied and diagnosed between the years 2010 and 2019 at the Department of Oral Medicine, Pathology, Diagnosis, and Radiology- Faculty of

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Dentistry, Benghazi University. The study was approved by the Ethics Committee of the Faculty of Dentistry of Benghazi University (approval number: 0304).
From the original data set of 662 case reports, we excluded 69 case reports for the following reasons: they had missing data, had an unclear diagnosis, or had a histopathological diagnosis of normal tissue. Therefore, a final sample of 593 case reports was reviewed using patients' medical records and biopsy files; the gathered information included patients' age, gender, and the anatomical site of the lesion. The histological slides were re-evaluated by the authors to confirm the diagnosis and to grade malignant tumours according to the World Health Organization classification (WHO 2017) [13]. All the cases were analysed in relation to patient age and gender, as well as the site and the histological diagnosis of the lesion.

Eligibility criteria
The study included medical records of Libyan patients diagnosed with oral and maxillofacial lesions, provided that the diagnosis was histologically confirmed. Eligible cases encompassed individuals of all age groups and both genders, with records spanning the period from 2010 to 2019. To ensure diagnostic accuracy and data integrity, cases were excluded if the lesion diagnosis was controversial or if the clinical information was incomplete or insufficient for analysis.

Statistical analysis
All descriptive and quantitative data analysis and graphs were performed using the Statistical Package for the Social Sciences (SPSS) software, version 21.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used for the variables, including age, gender, and site of the lesion. Chi-square test was used to assess the significance, and the level of statistical difference was set at < 0.05.

Results
Of the 593 case reports, female patients constituted almost more than half of the sample, 364(61%), compared to males, 299(38.6%), with a male-to-female ratio of (0.8:1). The patients' ages ranged from months to 92 years (the mean age, 38.66±18.137 years). For convenience, patients were divided into 3 age groups: young (months to 17), middle (18-64), and the old age group (> 65). Distribution and frequency of the patients according to sex and age groups are shown in (Table 1).

Table 1: Distribution of patients according to sex and age group

Variables		**N ((%**
Age groups	From 0 to 17	79(13.3%)
	From 18 to 64	460 (77.6%)
	From 65 to 92	54(9.1%)
Sex	Male	229(38.6%)
	Female	364(61.4 %)

For analysis, lesions were broadly classified into two main categories: non-neoplastic and neoplastic lesions. Most lesions fell under the non-neoplastic classification (467) and comprised about 79% of the study sample, with females being more affected than males, most commonly from the middle age group. In terms of anatomical site of the lesion, the gingival mucosa was the most frequently affected site with non-neoplastic lesions (19%), while the tongue was the preferred site for the neoplasms (5%) (Table 2).

Table 2: Distribution of lesion diagnostic categories according to patients' age and gender, and the predominant site of the lesion

Lesions category	**N ((%**	**M**	**F**	**From 0 to 17**	**From 18 to 64**	**From 65 to 92**	**Predominant site (%)**
Non-neoplastic lesions	467(78 (%	176(29.7%)	291(49.1%)	59(10%)	373(62.9%)	35(5.9%)	Gingiva
Neoplastic lesions	126(21.2 %)	53(8.9%)	73(12.3%)	21(3.5%)	87(14.7%)	18(3.0%)	Tongue

Non-neoplastic lesions
The most common subcategory within non-neoplastic diagnoses was inflammatory and reactive lesions (38%), followed by odontogenic cysts (18.4%), immune-mediated lesions (9.4%), and non-odontogenic cystic lesions (6.7%), with the majority being extravasated mucoceles (5.4%). The remaining lesions were relatively uncommon, accounting for 1.7% to 2.9% of all cases, and included vascular lesions, oral potentially malignant disorders (OPMD), and bone pathology. The most prevalent reactive lesion was the fibroepithelial polyp, accounting for approximately 13.7% of all cases, with a predominance in the buccal mucosa (4.4%). It was more frequently observed in females (8.9%) aged between 18 and 64 years.

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Regarding odontogenic cysts, the most prevalent odontogenic cyst was the radicular cyst (12.1%), most commonly in the maxilla (6.6%), with females (6.7%) being more frequently affected than males (5.4%), and typically occurs in individuals aged between 18 and 64 years. Other non-neoplastic lesions and their distribution, according to the patient's gender, age, and site of the lesion, are presented in (Table 3).

Table 3: Distribution and frequency of non-neoplastic lesions according to genders, age groups, and predominant sites

Diagnosis		Gender		Age group			Predominant site
	N (%)	M	F	Young From 0 to 17	Middle From 18 to 64	Old From 65 to 92	
Reactive and Inflammatory	225(37.9%)	71(12.0%)	154(26.0%)	16(2.7%)	192(32.4%)	17(2.9%)	Gingiva
Fibroepithelial polyp	81(13.7%)	28(4.7%)	53(8.9%)	4(0.7%)	73(12.3%)	4(0.7%)	Buccal mucosa
Pyogenic granuloma	68(11.5%)	18(3.0%)	50(8.4%)	5(0.8%)	60(10.1%)	3(0.5%)	Gingiva
Fibrous overgrowth	24(4.0%)	5(0.8%)	19(3.2%)	1(0.2%)	22(3.7%)	1(0.2%)	Gingiva
Peripheral giant cell granuloma	14(2.4%)	4(0.7%)	10(1.7%)	2(0.3%)	9(1.5%)	3(0.5%)	Gingiva
Simple keratosis	12(2.0%)	5(0.8%)	7(1.2%)	0(0.0%)	9(1.5%)	3(0.5%)	Tongue
Periapical granuloma	8(1.3%)	2(0.3%)	6(1.0%)	2(0.3%)	6(1.0%)	0(0.0%)	Mandible
Peripheral ossifying fibroma	8(1.3%)	4(0.7%)	4(0.7%)	2(0.3%)	6(1.0%)	0(0.0%)	Gingiva
Osteomyelitis	4(0.7%)	2(0.3%)	2(0.3%)	0(0.0%)	3(0.5%)	1(0.2%)	Mandible
Chronic sialadenitis	2(0.3%)	2(0.3%)	0(0.0%)	0(0.0%)	1(0.2%)	1(0.2%)	Submandibular salivary gland
Verrucous hyperplasia	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	0(0.0%)	1(0.2%)	Hard palate
Lingual abscess	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	Tongue
Immune-Mediated	57(9.7%)	19(3.3%)	38(6.4%)	0(0.0%)	49(8.3%)	8(1.4%)	Buccal mucosa
Lichen Planus	33(5.6%)	10(1.7%)	23(3.9%)	0(0.0%)	29(4.9%)	4(0. 7%)	Buccal mucosa
Pemphigus vulgaris	9(1.5%)	2(0.3%)	7(1.2%)	0(0.0%)	8(1.3%)	1(0.2%)	Buccal mucosa
Lichenoid reaction	4(0.7%)	1(0.2%)	3(0.5%)	0(0.0%)	2(0.3%)	2(0.3%)	Buccal mucosa
Sjögren syndrome	3(0.5%)	1(0.2%)	2(0.3%)	0(0.0%)	3(0.5%)	0(0.0%)	Buccal and labial mucosa
Erythema multiforme	2(0.3%)	0(0.0%)	2(0.3%)	0(0.0%)	1(0.2%)	1(0.2%)	Buccal mucosa and Gingiva
Discoid lupus erythematosus	2(0.3%)	2(0.3%)	0(0.0%)	0(0.0%)	2(0.3%)	0(0.0%)	Lower and upper lips
Mucous membrane pemphigoid	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	Buccal mucosa
Systemic lupus erythematosus	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Buccal mucosa
Orofacial granulomatosis	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Lower lip
Wegener granulomatosis	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Hard palate
Vascular Lesion	16(2.7%)	4(0.7%)	12(2.0%)	1(0.2%)	14(2.4%)	1(0.2%)	Gingiva
Vascular malformation	6(1.0%)	1(0.2%)	5(0.8%)	0(0.0%)	5(0.8%)	1(0.2%)	Gingiva
Hemangioma	4(0.7%)	2(0.3%)	2(0.3%)	1(0.2%)	3(0.5%)	0(0.0%)	Gingiva
Lymphatico-venous malformation	4(0.7%)	0(0.0%)	4(0.7%)	0(0.0%)	4(0.7%)	0(0.0%)	Buccal mucosa and upper lip
Aneurysmal blood vessels	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	Lower lip
Arterio-venous malformation	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Lower lip
OPMDS	11(1.9%)	6(1.0%)	5(0.8%)	0(0.0%)	6(1.0%)	5(0.8%)	Buccal mucosa
Verrucous leukoplakia	3(0.5%)	2(0.3%)	1(0.2%)	0(0.0%)	1(0.2%)	2(0.3%)	Lower lip
Mild epithelial dysplasia	3(0.5%)	1(0.2%)	2(0.3%)	0(0.0%)	2(0.3%)	1(0.2%)	Buccal and labial mucosa

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Hyperkeratosis with epithelial. dysplasia	3(0.5%)	2(0.3%)	1(0.2%)	0(0.0%)	2(0.3%)	1(0.2%)	Buccal mucosa
Candidal leukoplakia	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Buccal mucosa
Leukoplakia	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	Maxilla
Odontogenic cystic lesions	108(18.4%)	52(8.8%)	56(9.6%)	22(3.8%)	83(14 %)	3(0.6%)	Mandible
Radicular cyst	72(12.1%)	32(5.4%)	40(6.7%)	14(2.4%)	57(9.6%)	1(0.2%)	Maxilla
Odontogenic Keratocyst (OKC)	20(3.4%)	9(1.5%)	11(1.9%)	3(0.5%)	16(2.7%)	1(0.2%)	Mandible
Dentigerous cyst	11(1.9%)	9(1.5%)	2(0.3%)	4(0.7%)	7(1.2%)	0(0.0%)	Maxilla
Calcifying odontogenic Cyst (COC)	4(0.7%)	1(0.2%)	3(0.5%)	1(0.2%)	2(0.3%)	1(0.2%)	Mandible
Glandular odontogenic cyst	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Maxilla
Non- odontogenic cystic lesion	39(6.7%)	21(3.7%)	18(3.0%)	18(3.1%)	21(3.5%)	0(0.0%)	Lower lip
Mucus extravasation	32(5.4%)	17(2.9%)	15(2.5%)	17(2.9%)	15(2.5%)	0(0.0%)	Lower lip
Mucus retention	3(0.5%)	1(0.2%)	2(0.3%)	1(0.2%)	2(0.3%)	0(0.0%)	Floor of mouth
Dermoid cyst	2(0.3%)	1(0.2%)	1(0.2%)	0(0.0%)	2(0.3%)	0(0.0%)	Floor of mouth
Nasopalatine cyst	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Hard palate
Epidermoid cyst	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Sub-mental
Bone Pathology	11(1.9%)	2(0.4%)	9(1.5%)	2(0.4%)	8(1.4%)	1(0.2%)	Mandible
Central giant cell granuloma	6(1.0%)	1(0.2%)	5(0.8%)	0(0.0%)	6(1.0%)	0(0.0%)	Mandible
Cemento-osseous dysplasia	3(0.5%)	0(0.0%)	3(0.5%)	1(0.2%)	1(0.2%)	1(0.2%)	Mandible
Traumatic bone cyst	1(0.2%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	0(0.0%)	Mandible
Brown tumor	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	Mandible

Neoplastic lesions

Of the 593 cases, 126 biopsies were diagnosed as true neoplasms, and formed about 21% of the total sample. Of these, 50 (39.68%) were benign non-odontogenic, 22 (17.46%) were benign odontogenic, and 54 (42.06%) were malignant neoplasms. (Table 4) provides neoplastic lesions distributed according to gender, mean age, and the predominant location. The most frequent benign odontogenic neoplasm was ameloblastoma, 11 (1.8%) found mainly in the mandible, 5 (0.9%), with females (1.3%) being more frequently affected than males (0.5 %). Most of the patients were aged between 18 and 64 years. Squamous cell papilloma was the most frequent benign non-odontogenic neoplasm (1.7%), mainly affecting the tongue and the soft palate, with males (1.2%) being more frequently affected than females (0.5%), and most of the patients were of the middle age group. The second most frequent lesion of this subcategory was lipoma, followed by eosinophilic granuloma and pleomorphic adenoma.

The most common malignant neoplasm was squamous cell carcinoma (SCC) (5.4%) affecting mainly the tongue (3.4%), including well-differentiated squamous carcinoma (3.0%(, moderately differentiated squamous carcinoma (1.9%(, and poorly differentiated squamous carcinoma (0.5)%. This tumor was more common in female patients (3.3%) than males (2%), with an age range of 18 to 64 years. The second common malignant neoplasms were polymorphous low-grade adenocarcinoma and mucoepidermoid carcinoma; each of them formed 0.8 % of the total sample with a slight female predilection.

The remaining malignant tumours were less common and ranged from only 0.01% -0.2% of all the lesions and were found primarily in the middle and old age group, except Burkitt's lymphoma, which is the only malignant tumour found in children.

Among all the reviewed records, we find no malignant odontogenic neoplasm; therefore, we have not included this subcategory in the classification. For all the biopsied lesions, frequency distribution by age group has identified that patients in the youngest age group (0-17 years) had the two most frequent lesions; these are: mucus extravasation 17(2.9%) and radicular cyst 14(2.4%). In the middle age group (18-64 years), fibroepithelial polyp 73(12.3%), and pyogenic granuloma 60(10.1%) were the most common, while in elderly patients (≥65 years old), the most encountered lesion was squamous cell carcinoma 5(1.7%), followed by lichen planus 4(0.7%). The distribution of the lesions was found to be statistically significant in terms of the patient's gender and age group ($p < 0.05$).

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Table 4: Distribution and frequency of neoplastic lesions according to gender, age group, and the predominant site

Diagnosis		Gender Age group					Predominant site
	N (%)	M	F	Young From 0 to 17	middle From 18 to 64	old From 65 to 92	
Benign Odontogenic	22(3.7%)	8(1.3%)	14(2.4 %)	7(1.2%)	13(2.2 %)	2(0.3%)	Mandible
Ameloblastoma	11(1.8)	3(0.5%)	8(1.3%)	2(0.3%)	8(1.3%)	1(0.2%)	Mandible
Calcifying Epithelial Odontogenic Tumor (CEOT)	3(0.5%)	2(0.3%)	1(0.2%)	0(0.0%)	2(0.3%)	1(0.2%)	Maxilla, Mandible, and Hard Palate
Adenomatoid Odontogenic Tumor (AOT)	3(0.5%)	1(0.2%)	2(0.3%)	3(0.5%)	0(0.0%)	0(0.0%)	Maxilla
Odontogenic myxoma	2(0.3%)	1(0.2%)	1(0.2%)	0(0.0%)	2(0.3%)	0(0.0%)	Maxilla
Compound odontom	2(0.3%)	0(0.0%)	2(0.3%)	2(0.3%)	0(0.0%)	0(0.0%)	Mandible
Hybrid odontogenic tumor	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Mandible
Benign non-Odontogenic	50(8.4%)	24(4.0%)	26(4.4 %)	12(2.0%)	34(5.7 %)	4(0.7%)	Tongue
Squamous Cell papilloma	10(1.7%)	7(1.2%)	3(0.5%)	2(0.3%)	7(1.2%)	1(0.2%)	Tongue and Soft Palate
Lipoma	9(1.5%)	4(0.7%)	5(0.8%)	1(0.2%)	7(1.2%)	1(0.2%)	Tongue
Eosinophilic granuloma	6(1.0%)	4(0.7%)	2(0.3%)	3(0.5%)	3(0.5%)	0(0.0%)	Tongue and Mandible
Pleomorphic adenoma	5(0.8%)	1(0.2%)	4(0.7%)	1(0.2%)	3(0.5%)	1(0.2%)	Buccal mucosa and Hard palate
Neurofibroma	3(0.5%)	2(0.3%)	1(0.2%)	0(0.0%)	3(0.5%)	0(0.0%)	Buccal mucosa
Congenital epulis	3(0.5%)	0(0.0%)	3(0.5%)	3(0.5%)	0(0.0%)	0(0.0%)	Alveolar ridge
Myxofibroma	2(0.3%)	1(0.2%)	1(0.2%)	1(0.2%)	1(0.2%)	0(0.0%)	Mandible
Central ossifying fibroma	2(0.3%)	0(0.0%)	2(0.3%)	0(0.0%)	2(0.3%)	0(0.0%)	Maxilla and Mandible
Plasma cell granuloma	2(0.3%)	1(0.2%)	1(0.2%)	0(0.0%)	2(0.3%)	0(0.0%)	Buccal mucosa and labial mucosa
Osteoma	2 (0.3%)	1(0.2%)	1(0.2%)	0(0.0%)	2(0.2%)	0(0.0%)	Mandible
Schwannoma	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Lower lip
Neuroma	1(0.2%)	0(0.0%)	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	Vestibule
Granular tumor	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	0(0.0%)	Tongue
Keratoacanthoma	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	0(0.0%)	1(0.2%)	Lower lip
Basal cell adenoma	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	Lower lip
Myoepithelioma	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	Hard palate
Malignant	54(9.1%)	21(3.5%)	33(5.6 %)	2(0.4%)	40(6.7 %)	12(2.0 %)	Tongue
Squamous cell carcinoma	32(5.4%)	12(2%)	20(3.3 %)	0(0.00%)	22(3.7 %)	10(1.7 %)	Tongue
mucoepidermoid carcinoma	5(0.8%)	0(0.0%)	5(0.8%)	0(0.0%)	5(0.8%)	0(0.0%)	Buccal mucosa
Polymorphous low-grade adenocarcinoma	5(0.8%)	2(0.3%)	3(0.5%)	0(0.0%)	5(0.8%)	0(0.0%)	Hard palate
Spindle cell carcinoma	2(0.3%)	1(0.2%)	1(0.2%)	0(0.0%)	2(0.3%)	0(0.0%)	Tongue
Fibrous histiocytoma	2(0.3%)	0(0.0%)	2(0.3%)	0(0.0%)	2(0.3%)	0(0.0%)	Mandible and Upper Lip
Non-Hodgkin's lymphoma	2(0.3%)	2(0.3%)	0(0.0%)	0(0.0%)	2(0.3%)	0(0.0%)	Tongue and Hard Palate
Verrucous carcinoma	2(0.3%)	2(0.3%)	0(0.0%)	0(0.0%)	2(0.3%)	0(0.0%)	Retromolar area
Adenocarcinoma	1(0.2%)	0(0.0%)	1(0.2%)	0(0.0%)	0(0.0%)	1(0.2%)	Maxilla
Burkitt's lymphoma	1(0.2%)	0(0.0%)	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	Mandible

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Basal cell carcinoma	1(0.2%)	1(0.2%)	0(0.0%)	0(0.0%)	0(0.0%)	1(0.2%)	Right side behind the eye
Hemangioendothelioma	1(0.2%)	1(0.2%)	0(0.0%)	1(0.0%)	0(0.0%)	0(0.0%)	Maxilla and Buccal mucosa

Discussion

Oral health is an integral component of a patient's overall health, and accurate diagnosis of oral and maxillofacial lesions is crucial to ensure proper patient management. Many of these lesions have specific signs and/or symptoms allowing quick and relatively accurate diagnosis; however, a large proportion of oral lesions have similar clinical and even radiographic presentation and need a more complex diagnostic process. Therefore, clinical data alone are usually not sufficient, and histopathological examination is required for a definite diagnosis [14]. This study aimed to investigate the prevalence and characteristics of oral and maxillofacial lesions in the Libyan population of Benghazi, for both genders of all age groups, in terms of histopathological diagnosis, during the period from 2010 to 2019. Of the 593 patients, females constituted more than half of the study sample (about 60%). This figure was almost in contrast to that found in a similar study conducted in Brazil [15] in the years from 2011 to 2015; however, it is still comparable with those found in other countries like Spain [16], and England [17]. Age-based analysis revealed that middle-aged patients represented most of this study (about 78%), considering that all age groups were included. Therefore, our results may differ from those reported by Jones and his colleagues' year [17], who excluded patients below 18 from their survey, and Fonseca et al [18], who included only elderly patients

For analysis, the lesions were divided into two main categories (non-neoplastic and neoplastic), of which the non-neoplastic lesions predominated (78%). In fact, this was not surprising, as most of the literature reported a higher proportion of non-neoplastic pathology [19,20]. In the non-neoplastic category, the inflammatory and reactive lesions were the most frequently diagnosed, forming about 38% of the study sample in the form of fibroepithelial polyps and pyogenic granulomas, and most of the patients were females of the middle age group. Our results align with those found in the UK [19] and the USA [20]. The second most common subcategory in this study was the odontogenic cysts, with 72 cases diagnosed as radicular cysts, forming about 66% of all the odontogenic cysts. This figure is comparable to that reported in Spain [16]; though, it is slightly higher than that of Turkey (63.5%) [21], but lower than the figure reported in England [19], where the radicular cyst represented up to 80% of the odontogenic cysts.

In immune-mediated subcategory, lichen planus was the most frequent lesion, forming 5.6% of the total sample, with males being more frequently affected. Although unexpected, this figure is different from that of a similar study carried out in the west of Libya [22], where the diagnosis of lichen planus was more common in female patients. This contradiction, however, may reflect the demographic variations between the eastern and the western regions of the same country, possibly due to environmental factors or certain social habits.

The fourth most diagnosed lesion in this study was an extravasated mucocele. There have been 32 patients, most of them of the youngest age group, diagnosed with extravasated mucoceles, which is quite like that found in Tripoli (33) [22], and comparable to those of previous research [17,19, 23]. The vascular lesions subcategory lies in the fifth place and constitutes nearly 3% of all the lesions. The remaining two subcategories within the non-neoplastic lesions were presented by OPMD and bone pathology, where both constituted a small portion of the total sample (1.9 and 1.7%), respectively. Having included some bony lesions under other categories resulted in the smallest proportion of bone pathology (1.7% of all the biopsies), with central giant cell granuloma being the most frequent bone lesion (60%), mostly in female patients of the middle age group. Our results align with those from western Libya [22] and other countries [19,21], but are different from those found in Spain [16], where bisphosphonate-related osteonecrosis was the predominant lesion in this group.

The second main category in this study was the neoplastic lesions, accounting for approximately 21% of all the biopsied lesions, with the majority (57%) being benign neoplasms, and these were further subdivided into odontogenic and non-odontogenic neoplasms. Of the members of non-odontogenic tumours, Squamous cell papilloma was the most frequently encountered lesion, supporting the previous findings of the literature [19]. The other, less frequent but commonly found lesions in this group were: lipoma, eosinophilic granuloma, and pleomorphic adenoma.The odontogenic tumours were less commonly encountered, accounting for 3.7% of all the lesions, which agrees with those reported in the west of Libya [22] and England [19] but is higher than that found in Spain (0.5%) [16].

Ameloblastoma is a benign but locally invasive odontogenic tumour, for which complete resection is required [24]. In the current study ameloblastoma was the most common odontogenic lesion; mainly in middle aged females, which is in agreement of that found in the west of this country [22], and that reported from Japan [25], while the figure was entirely different from that found in England [19] where no cases of ameloblastoma have been observed despite the considerably large sample size. Besides the tendency of this tumour to occur in specific racial groups [26], this discrepancy can also be explained by variations in study methods and classification. Additionally, odontomes, which were the most encountered odontogenic tumours in Franklin and Jones' survey [19], their incidence may have been underestimated

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in our research because of their asymptomatic nature, as most of the odontomes are discovered incidentally during radiographic examination.

Regarding Malignant neoplasms, squamous cell carcinoma formed about 60% of the malignant neoplasms in this study, and 5.4% of all the lesions. Tongue was the most common site, with females being slightly more affected than males. Our results were like those reported earlier in Benghazi [3, 27], despite the relatively higher female predilection for this lesion in the current study. Salivary gland malignancies account for 0.5 to 1.2% of all cancers, and about 5% of head and neck cancer [28]. In this study; malignant salivary gland tumours stand in the second place of the malignant lesions, presented mainly by mucoepidermoid carcinoma and polymorphous low-grade adenocarcinoma, which is similar to that reported earlier in Libya [27,28]. Though it is different from that reported in England [19], where the non-Hodgkin's lymphoma was the second most common malignant lesion; however, this trend is still comparable to our results, where the non-Hodgkin lymphoma was the third most frequent malignancy. Despite the relatively small sample size of this study, it provides valuable information about the frequency and distribution of oral lesions in the Libyan population, which would be useful for future research. So, further large-scale epidemiological studies are recommended to better define the prevalence and characteristics of oral and maxillofacial lesions in the Libyan population.

Conclusion

Most lesions identified in this study were non-neoplastic in nature, with the fibro-epithelial polyp being the most frequently diagnosed lesion, followed by the radicular cyst. Females were more commonly affected than males, with the difference being statistically significant, primarily affecting middle-aged individuals.

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Conflicts of interest

No conflicts of interest.

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