

## Concordance between clinical and histopathological diagnoses of biopsied oral cavity lesions

Diagnosis of oral cavity lesions

Ahmet Altan, Sefa Çolak, Nihat Akbulut  
Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Gaziosmanpaşa University, Tokat, Turkey

### Abstract

**Aim:** The aim of this study was to compare the clinical and histopathological diagnoses of biopsied oral cavity lesions, to evaluate the diagnostic concordance characteristics of these lesions and to reveal the demographic characteristics of lesions. **Material and Method:** In this retrospective study, the histopathological reports of patients who underwent biopsy between February 2013 and May 2018 were examined and analyzed. Gender, age, location of the lesion, clinical and final histopathological diagnoses were determined from patient records. The lesions were divided into three main categories according to their final histopathological diagnosis: Group 1 (Developmental, inflammatory, reactive lesions of the jaws), Group 2 (Cystic lesions), and Group 3 (Tumors and tumor-like lesions). **Results:** The records of 506 patients were examined in the study. Patients' ages ranged from 8 to 80 years (mean:  $37.1 \pm 17.5$ ). The distribution of lesions by groups was as follows: Group 1: 105 (20.8%), Group 2: 333 (65.8%), and Group 3: 68 (13.4%). Two hundred and seventy-five of the patients were male (54.3%) and 231 of them were female (45.7%). Two hundred and fifteen of the lesions were localized in the maxilla (42.5%) and 291 of them were localized in the mandible (57.5%). The concordance rate of diagnoses was 87.4% as a result of the comparison of clinical and final histopathological diagnoses. **Discussion:** The clinician's knowledge about the lesion has a significant effect on the concordance between clinical and histopathological diagnoses. The correct and early diagnosis of lesions will prevent unnecessary treatments and delayed surgical operations.

### Keywords

Jaw Lesions; Mouth; Oral Biopsies; Demographic Study

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Corresponding Author: Ahmet Altan, Gaziosmanpaşa University, Faculty of Dentistry, Ali Sevki Ereğ Yerleşkesi, Tokat, Turkey.  
GSM: +905057013189 F.: +90 356212 4225 E-Mail: dt.ahmetaltan@gmail.com  
ORCID ID: 0000-0003-2041-6364

**Introduction**

The oral cavity is a complex region of the head and neck region which consists of various structures such as teeth, jaw, tongue, salivary glands, soft and hard palate. Oral cavity can be considered a mirror of general health. This region may be affected by reactive, infectious, cystic, precancerous and neoplastic lesions and diseases, and some of these diseases may cause significant health problems [1, 2].

Various clinical and radiological features can be used in the diagnosis of jaw lesions. In a pathology observed in the mouth, histopathological examination is considered as the gold standard to confirm the clinical diagnosis [3]. Early diagnosis and treatment play important roles in improving the survival rate and quality of life of patients [4]. For this reason, clinicians should be quite careful especially in the first clinical diagnosis of precancerous and malignant lesions. The diagnosis and treatment of lesions require knowledge of the underlying pathology of the lesion, as well as the clinical features of the lesion [5]. Comprehensive information on oral cavity lesions will help the clinician choose the right treatment option and the patient to be referred to a specialist physician when necessary. Therefore, the evaluation of concordance between clinical and histopathological diagnoses of oral cavity lesions becomes important.

The aim of this study was to compare the clinical and histopathological diagnoses of biopsied oral cavity lesions, to evaluate the diagnostic concordance characteristics of these lesions and to reveal the demographic characteristics of lesions.

**Material and Method**

In this retrospective study, the histopathological reports of patients who were admitted to Gaziosmanpaşa University, Faculty of Dentistry, Oral, Dental and Maxillofacial Surgery Clinic between February 2013 and May 2018 and underwent biopsy for

various reasons were examined and analyzed. Gender, age, location of the lesion, clinical and final histopathological diagnoses were determined from patient records. Patient forms with missing data were excluded from the study. The records of the lesions that were operated again were considered as a single lesion. In the study, the concordance between the temporary diagnosis of lesions which was made as a result of the clinical examination and the final diagnosis which was made as a result of the histopathological examination was compared. The lesions were divided into three main categories according to their final histopathological diagnosis: Group 1 (Developmental, inflammatory, reactive lesions of the jaws), Group 2 (Cystic lesions), and Group 3 (Tumors and tumor-like lesions). This study was approved by the local Ethics Committee (Project no: 18KAEK174). The variables were recorded and analyzed using descriptive statistics.

**Results**

The records of 506 patients were examined in the study. Patients' ages ranged from 8 to 80 years (mean: 37.1 ± 17.5). The distribution of lesions by groups was as follows: Group 1: 105 (20.8%), Group 2: 333 (65.8%), and Group 3: 68 (13.4%). Two hundred and seventy-five of the patients were male (54.3%) and 231 of them were female (45.7%). Two hundred and fifteen of the lesions were localized in the maxilla (42.5%) and 291 (57.5%) of them were localized in the mandible (Table 1).

When all groups are considered, radicular cyst (n=209; 41.3%) was the most common biopsied lesion. It was followed by dentigerous cyst (n=89; 17.5%) and irritation fibroma (n=40; 7.9%). Table 2 shows the developmental, inflammatory, reactive lesions of the jaws in Group 1. In Group 1, the pathology reports of 105 patients (52 males, 53 females) were analyzed. Patients' ages ranged from 8 to 78 years (mean: 42.6 ± 19.3) The lesions in this group were listed as irritation fibroma (n= 40, 38.1%),

Table 1. Distribution of oral cavity lesions according to location, gender and age

Groups	n	%	Location				Gender				Age range	Mean age±SD
			Maxilla		Mandible		Male		Female			
			n	%	n	%	n	%	n	%		
Group 1	105	20.8	37	35.2	68	64.8	52	49.5	53	50.5	8-78	42.6±19.3
Group 2	333	65.8	147	44.1	186	55.9	195	58.6	138	41.4	9-80	34.6±15.6
Group 3	68	13.4	31	45.6	37	54.4	28	41.2	40	58.8	8-80	40.6±20.6
Total	506	100	215	42.5	291	57.5	275	54.3	231	45.7	8-80	37.1±17.5

Table 2. Distribution of Group 1 lesions according to location and gender

Group 1	n	%	Location									Gender						
			Maxilla						Mandible			Male		Female				
			Anterior		Premolar		Posterior		Anterior		Premolar	Posterior	n	%	n	%		
			n	%	n	%	n	%	n	%	n	%	n	%	n	%		
Irritation fibroma	40	38.1	7	6.7	4	3.8	1	0.9	14	13.3	8	7.6	6	5.7	16	15.2	24	22.9
Giant cell granuloma	28	26.7	2	1.9	4	3.8	1	0.9	5	4.8	9	8.5	7	6.7	16	15.2	12	11.4
Inflammatory granulation tissue	16	15.2	3	2.8	4	3.8	1	0.9	2	1.9	3	2.8	3	2.8	10	9.5	6	5.7
Pyogenic granuloma	13	12.4	2	1.9	2	1.9	-	-	3	2.8	4	3.8	2	1.9	6	5.7	7	6.7
Epulis fissuratum	5	4.8	4	3.8	-	-	-	-	1	1.9	-	-	-	-	2	1.9	3	2.9
Osteomyelitis	2	1.9	-	-	1	0.9	-	-	-	-	-	-	1	0.9	2	1.9	-	-
Torus/Exostosis	1	0.9	-	-	1	0.9	-	-	-	-	-	-	-	-	-	-	1	0.9
Total	105	100	18	17.1	16	15.1	3	2.7	25	24.7	24	22.7	19	18	52	49.4	53	50.5

giant cell granuloma (n=28, 26.7%), inflammatory granulation tissue (n=16, 15.2%), pyogenic granuloma (n=13, 12.4%), epulis fissuratum (n=5, 4.8%), osteomyelitis (n=2, 1.9%), and torus/exostosis (n=1, 0.9%). Mandibular anterior (n=25, 24.7%) and mandibular premolar (n=24, 22.7%) were the regions where Group 1 lesions were most common. The incidence of lesions in the lower jaw was most common in the mandibular anterior region. The maxillary anterior region was the most affected region in the upper jaw. The prevalence of Group 1 lesions in the mandible (n=68, 64.8%) was higher.

Table 3 shows the cystic lesions in Group 2. The ages of 333 patients (195 males, 138 females) in Group 2 ranged from 9 to 80 years (mean: 34.6±15.6). In this group, radicular cyst (n=219, 65.8%) was most common, which was followed by dentigerous cyst (n=89, 26.7%), residual cyst (n=13, 3.9%), odontogenic keratocyst (n=10, 3%) and nasopalatine canal cyst (n=2, 0.6%). The cystic lesions in this group were almost equal in the mandibular posterior (n=116, 34.8%) and maxillary anterior (n=106, 31.8%) regions. The incidence of Group 2 lesions in men (n=195, 58.6%) was more frequent. The incidence of lesions in the lower jaw was most common in the mandibular posterior region. The maxillary anterior region was the most affected region in the upper jaw. The prevalence of Group 2 lesions in the mandible (n=186, 55.9%) was higher.

Table 4 shows tumors and tumor-like lesions in Group 3. The ages of 68 patients (28 males, 40 females) in this group ranged

from 8 to 80 years (mean: 40.6 ± 20.6). In this group, odontoma (n=26, 38.2%) was most common, which was followed by papilloma (n=13, 19.1%), ameloblastoma (n=7, 10.3%), squamous cell carcinoma (n=5, 7.4%) and ossifying fibroma (n=5, 7.4%). The other lesions that were found in smaller number contained osteoma, fibrous dysplasia, pleomorphic adenoma, periapical cemental dysplasia, calcified cystic odontogenic tumor, and schwannoma. Approximately one-third of the tumor and tumor-like lesions were localized in the mandibular posterior (n=25, 36.8%) region. Maxillary anterior (n=13, 19.1%) and maxillary posterior (n=12, 17.6%) were other apparent anatomical localizations. The incidence of Group 3 lesions in women (n=40, 58.8%) was more frequent. The region where these lesions were mostly localized in the lower jaw was the mandibular posterior (n=25, 36.8%) region. In the upper jaw, the lesions were more frequently localized in the maxillary anterior (n=13, 19.1%) and maxillary posterior (n=12, 17.6%) regions. The prevalence of Group 3 lesions in the mandible (n=37, 54.4%) was higher.

The concordance rate of diagnoses was 87.4% as a result of the comparison of clinical and final histopathological diagnoses (Table 5). Maximum non-concordance was observed in Group 1 lesions (n= 44, 41.9%). In 18 cases with non-concordance in Group 1, the lesions were clinically defined as pyogenic granuloma. The concordance between clinical and histopathological diagnoses of Group 2 lesions was 97.8%. In 3 cases, odontogenic keratocyst was clinically diagnosed as ameloblastoma.

Table 3. Distribution of Group 2 lesions according to location and gender

Group 2	n	%	Location												Gender			
			Maxilla						Mandible						Male		Female	
			Anterior		Premolar		Posterior		Anterior		Premolar		Posterior		n	%	n	%
			n	%	n	%	n	%	n	%	n	%	n	%				
Radicular Cyst	219	65.8	81	24.3	13	3.9	15	4.5	27	8.1	23	6.9	60	18	120	36	99	29.7
Dentigerous Cyst	89	26.7	19	5.7	3	0.9	4	1.2	10	3	2	0.6	51	15.3	55	16.5	34	10.2
Residual Cyst	13	3.9	4	1.2	4	1.2	1	0.3	1	0.3	1	0.3	2	0.6	10	3	3	0.9
Odontogenic keratocyst	10	3	-	-	-	-	1	0.3	4	1.2	2	0.6	3	0.9	9	2.7	1	0.3
Nasopalatine duct cyst	2	0.6	2	0.6	-	-	-	-	-	-	-	-	-	-	1	0.3	1	0.3
Total	333	100	106	31.8	20	6	21	6.3	42	12.6	28	8.4	116	34.8	195	58.5	138	41.4

Table 4. Distribution of Group 3 lesions according to location and gender

Group 3	n	%	Location												Gender			
			Maxilla						Mandible						Male		Female	
			Anterior		Premolar		Posterior		Anterior		Premolar		Posterior		n	%	n	%
			n	%	n	%	n	%	n	%	n	%	n	%				
Odontoma	26	38.2	10	14.7	4	5.9	3	4.4	1	1.5	-	-	8	11.8	9	13.2	17	25
Papilloma	13	19.1	2	2.9	1	1.5	3	4.4	2	2.9	2	2.9	3	4.4	8	11.8	5	7.4
Ameloblastoma	7	10.3	1	1.5	1	1.5	-	-	-	-	-	-	5	7.4	1	1.5	6	8.8
Ossifying Fibroma	5	7.4	-	-	-	-	2	2.9	1	1.5	1	1.5	1	1.5	2	2.9	3	4.4
Squamous cell carcinoma	5	7.4	-	-	-	-	1	1.5	1	1.5	1	1.5	2	2.9	5	7.4	-	-
Osteoma	4	5.8	-	-	-	-	1	1.5	-	-	-	-	3	4.4	1	1.5	3	4.4
Fibrous dysplasia	3	4.4	-	-	-	-	-	-	1	1.5	-	-	2	2.9	-	-	3	4.4
Pleomorphic adenoma	2	2.9	-	-	-	-	2	2.9	-	-	-	-	-	-	-	-	2	2.9
Periapical Cemental Dysplasia	1	1.5	-	-	-	-	-	-	1	1.5	-	-	-	-	-	-	1	1.5
Calcifying Cystic Odontogenic Tumor	1	1.5	-	-	-	-	-	-	-	-	1	1.5	-	-	1	1.5	-	-
Swannoma	1	1.5	-	-	-	-	-	-	-	-	-	-	1	1.5	1	1.5	-	-
Total	68	100	13	19.1	6	8.9	12	17.6	7	10.4	5	7.4	25	36.8	28	41.3	40	58.8

Table 5. Concordance between clinical and histopathologic diagnosis in oral cavity lesions

Histopathologic diagnosis	Concordance		Disconcordance		Total
	n	%	n	%	
Developmental/reactive and inflammatory lesions (Group 1)	61	58.1	44	41.9	105
Cystic lesions (Group 2)	326	97.8	7	2.2	333
Tumor and tumor like lesions (Group 3)	55	80.8	13	19.2	68
Total	442	87.4	64	12.6	506

The concordance between temporary and final diagnoses of Group 3 lesions was 80.8%. Seven of the lesions in this group with non-concordance were diagnosed as a cystic lesion.

## Discussion

The regular monitoring of the incidence of a disease in a population is important for preventive approaches and future planning. This study shows the general profile of oral cavity lesions in the Turkish Middle Black Sea population. Most of the lesions in this study were in the odontogenic/non-odontogenic cystic lesions (n=333, 65.8%) category. These results were consistent with studies carried out in different regions in the Turkish population [6, 7] Furthermore, similar results were also obtained in the studies carried out by Al Yamani et al. [8], Utsumi et al. [9] in different populations. The most common odontogenic cyst of the jaws is the radicular cyst that occurs after trauma or dental caries. These cysts constitute approximately 52% to 68% of all cysts affecting the jaw bones [10]. The most common cystic lesion in this study was the radicular cyst. The radicular cyst constituted 65.8% of all cystic lesions.

According to the classification made by the World Health Organization in 2005, odontogenic keratocyst was included in the tumor category as a keratocystic odontogenic tumor. However, it was included in the 2017 World Health Organization cyst classification [11]. It was named odontogenic keratocyst again. This study is one of the first reports on the demographic characteristics of oral cavity lesions in the Turkish population according to the current 2017 WHO classification.

Reactive lesions are characterized as an excessive proliferation of connective tissue in response to chronic irritation [12]. Irritation fibroma is one of the most common reactive lesions in the oral cavity, which is caused by traumatic irritants such as dental calculus, foreign body, chronic biting, incompatible restorations [13]. The most common reactive lesion in this study was irritation fibroma. Pyogenic and giant cell granulomas are also included in reactive lesions. The clinical features of pyogenic granuloma and giant cell granulomas have similar characteristics [14, 15]. In this study, maximum non-concordance between clinical and histopathological diagnoses was observed in Group 1 including developmental, inflammatory, reactive lesions of the jaws. In the present study, pyogenic and giant cell granulomas were clinically confused in 18 cases.

Odontomas are benign tumors that arise with the co-development of epithelial and mesenchymal cells. They constitute approximately 5% to 30% of all odontogenic tumors of the jaws [16]. Bereket et al. [17] reported that complex odontomas were more common in the posterior region of the mandible in the anterior of compound odontomas. The most common odonto-

genic tumor in this study was odontoma. The maxillary anterior region was the most affected region. Complex odontomas constituted most of the odontomas (n=19, 73%)

The study revealed that the concordance between clinical and histopathological diagnoses of all lesions was 87.4%. In this study, the clinicians were very successful in the diagnosis of cystic lesions in Group 2. In 3 of Group 2 lesions, the odontogenic keratocyst was clinically diagnosed as ameloblastoma. It is accepted that the radiological features of cysts and tumors associated with an impacted tooth are similar [18]. Alves et al. [19] reported that there were radiologically fine differences between ameloblastoma and odontogenic keratocyst. In their study, it was reported that the imaging performed with computed tomography in odontogenic keratocyst showed the changes such as buccolingual expansion, calcification, bone septa, tooth resorption, and cortical bone expansion more clearly although panoramic x-rays are useful in the evaluation of these two lesions. It could be useful for clinicians to use advanced imaging techniques when they are undecided about a clinical diagnosis. The close dialogue between the clinician and the pathologist who prepares the report is useful to increase the accuracy of the histopathological diagnosis. Pathologists value clinical details. To make a clinical diagnosis or differential diagnosis is like a summary of the clinician's thoughts about the biopsied lesion in terms of the pathologist. In their study, Sardella et al. [20] reported that Italian dental and medical practitioners had limited knowledge in oral medicine. They reported that there was a need for better education in the diagnosis and treatment of oral diseases. The concordance between clinical and histopathological diagnoses was found to be high in this study due to the fact that the clinicians were oral and maxillofacial surgeons. In conclusion, the demographic and clinical features of oral cavity lesions were analyzed in this study. The clinician's knowledge about the lesion has a significant effect on the concordance between clinical and histopathological diagnoses. The correct and early diagnosis of lesions will prevent unnecessary treatments and delayed surgical operations.

### Scientific Responsibility Statement

*The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.*

### Animal and human rights statement

*All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.*

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### Conflict of interest

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