

Clinical and Pathological Examination of Jaw Masses: Retrospective Analysis of 69 Cases

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Abstract

Introduction: The aim of this study was to retrospectively evaluate the clinicopathological features of the patients who presented with a mass in the jaw. **Materials and Methods:** Clinical files and histopathological records of 69 patients who presented to our clinic with complaints of swelling or mass in the upper or lower jaw between 2010 and 2018 were analyzed retrospectively. **Results:** Of the cysts and tumoral lesions in patients, 50.7% (35/69) were located in the maxilla and 49.3% (34/69) were located in the mandible. 23 (32.8%) odontogenic cysts, 11 (15.7%) non-odontogenic cysts, 15 (21.4%) odontogenic tumors, 12 (17.4%) local metastases from adjacent tissues to maxilla and mandible, 5 (7.1%) other distant metastases. Among the odontogenic cysts, the most common radicular cysts were 39.13% (10/23), the second had dentigerous cyst 34.78% (8/23). In our 11 patients with non-odontogenic cysts, only nasoalveolar cysts were observed. The distribution of odontogenic tumors are; 40% (6/15) odontoma, 26.6% (4/15) giant cell reparative granuloma, 20% (3/15) ameloblastoma, 6.6% (1/15) rates of cementoma and odontogenic fibroma. **Conclusion:** When the etiologic causes of the patients who have complaints of mass in the jaw are examined, we can encounter many different pathologies. Although odontogenic and non-odontogenic cysts are the most common benign masses, we should consider the masses that metastasize to this region and the primary tumors originating from this region.

Keywords: Cyst, mandible, maxilla, metastasis, odontogenic, tumor

INTRODUCTION

Odontogenic cysts and tumors play an important role in the pathology of oral and maxillofacial regions. Although odontogenic cysts are very common in the daily practice of dentists, they rarely encounter odontogenic tumors. Odontogenic tumors constitute <1% of the samples coming to specific oral and maxillofacial pathology laboratories. Cysts covered with epithelium in the bone are seen only in the jaw, with exceptions. These cysts covered with odontogenic epithelium are called odontogenic cysts. These cysts are divided into two as the developmental and inflammatory origin. While the most common form of developmental cysts is dentigerous (follicular) cysts, the most common type of inflammatory origin is radicular cysts.

On the other hand, non-odontogenic cysts are not associated with tooth development, but they are related to epithelial residues from the development of facial tissues. These patients usually present with a complaint of a slowly growing

jaw mass. Panoramic mandibular radiography (PMR) is accepted as the standard radiological method. Computed tomography (CT) is used to demonstrate bone destruction and spread to surrounding tissues, and magnetic resonance imaging (MRI) is preferred for the determination of cyst content. The definitive diagnosis can be made by histopathological evaluation.^[1,2]

We define odontogenic epithelial tumors without odontogenic ecto-mesenchymal components. Several different tumors are included in odontogenic tumors. The most important and known example of these is ameloblastoma. These are relatively rare lesions with bone erosion. Their biological behavior varies

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from hamartomatous/non-neoplastic tissue proliferation to malignancies that can metastasize.^[1] In this study, we aimed to increase the awareness of physicians about odontogenic cysts and tumors that are not seen frequently by analyzing the clinical features and histopathological results of patients presenting to our clinic with jaw swelling or mass.

MATERIALS AND METHODS

In this study, we have investigated the patients who admitted to our clinic with the complaint of swelling or mass in the lower or upper jaw between 2010 and 2018. Patients without histopathological diagnosis were not included in the study. The study was approved by the hospital ethics committee.

In this study, demographic records, localization of the mass, surgical interventions, and histopathological diagnoses were taken into consideration. In the diagnosis, firstly, physical examination including mandible, maxilla, gingiva, and mouth floor was evaluated and then radiological examinations such as PMR was used to determine the mass but if necessary for defining surrounding soft and bone tissues CT and MRI were used. The surgical approach included intraoral enucleation, curettage, chemical cauterization, and partial mandibular and maxilla resections in tumors. These lesions were divided into two groups as cystic and tumoral. Tumors were classified as the primary odontogenic origin and secondary metastatic. Patients with impaired anatomical integrity and occlusion of the jaw in the postoperative clinic controls of the patients evaluated.

Statistical analysis is applied with InStat (Graphpad, USA) program. Mean, standard deviation, frequency, and percentage distributions were used as descriptive statistical analyzes.

RESULTS

In our study, the age range of 69 patients who presented with swelling or mass in the lower or upper jaw was between 11 and 82 years of age. An 11-year-old male patient had a radicular cyst in the mandible and an 82-year-old male patient had an odontogenic tumor in the mandible. Forty-seven (68.1%) of 69 patients were male and 22 (31.9%) were female. The male/female ratio was 2.13/1 [Table 1]. 50.7% (35/69) of the cysts and tumor lesions were located in the maxilla and 49.3% (34/69) of the patients were located in the mandible. 23 (32.8%) of these lesions were odontogenic cyst, 11 (15.7%) non-odontogenic cyst, 15 (21.4%) odontogenic tumor, 12 (17.4%) maxilla and local distant metastases from tissues adjacent to the mandible, 5 (7.1%) of other distant metastases, 1 patient had brown tumor in mandible due to parathyroid adenoma, 2 diffuse large cell lymphoma and maxillary sinus cystic carcinoma located in the maxillary sinus. When we look at the distribution of patients according to age groups; the most common rate was in the 51–60 age group with the rate of 26.08% (18 patients), and secondly in the 31–40 age group with 23.18% (16 patients).

Among the odontogenic cysts, the most common radicular cyst was 39.13% (10/23) [Figure 1], the second was

dentigerous cyst 34.78% (8/23), the third was glandular odontogenic cyst (13/4%) and finally, the odontogenic keratocyst. 8.6% (2/23) [Figure 2] was seen in the rate. Only 11 nasoalveolar cysts were observed in 11 cases as non-odontogenic cysts [Figure 3]. The distribution of odontogenic tumors; 40% (6/15) odontoma, 26.6% (4/15) giant cell reparative granuloma [Figure 4], 20% (3/15) ameloblastoma [Figure 5], 6.6% (1/15) in the rate of cementum and odontogenic fibroma.

Ten (55.5%) of the metastases were in the mandible and 7 were in the maxillary bone. The distribution of cases that metastasized to the mandible; oral squamous cell carcinoma metastasis was seen in 4 patients, metastasis of thyroid carcinoma in 2 patients, metastasis of breast, stomach, colon adenocarcinoma in 3 patients, and submandibular gland metastasis in one patient was poorly differentiated.

The distribution of patients with metastases to the maxillary bone is; four patients had oral cavity minor salivary gland adenocarcinoma metastasis, three patients had invasive and basosquamous cell carcinoma and the other one had nasal cavity squamous cell carcinoma metastasis.

DISCUSSION

Odontogenic and nonodontogenic cysts, which are frequently encountered in patients presenting with a mass in the lower and upper jaw, should also be considered in the differential diagnosis of primary tumors that metastatic tumors in this region.^[3] In this long-term retrospective study, we analyzed odontogenic and non-odontogenic cystic or tumoral lesions in the mandibular and maxillary swelling or masses, as well as the clinicopathological features of tumors metastasizing from surrounding tissues or distant organs to this region. Odontogenic and non-odontogenic cysts are important in the differential diagnosis of the masses located in the jaw region due to their clinical and radiological features. The definitive diagnosis can only be made by histopathological examination.



Figure 1: Sample images of a radicular cyst (red arrowhead) containing the left canine tooth root of the mandible

Table 1: Distribution of the jaw cysts and tumors of the patients

Jaw Pathologies	Maxilla	Mandibula	Total Number	Total (%)
Odontogenic cyst				23 (32.8)
Radiculer cyst	6	4	10	
Dentigenous cyst	2	6	8	
Glandular odontogenic cyst	-	3	3	
Odontogenic keratocyst	2	-	2	
Nonodontogenic cyst				11 (15.7)
Nasoalveolar cyst	11	-	11	
Odontogenic tumors				15 (21.4)
Odontoma	1	5	6	
Giant cell reparative granuloma	2	2	4	
Ameloblastoma	-	3	3	
Cementoma	1	-	1	
Odontogenic fibroma	-	1	1	
Regional metastasis	7	5		12 (17.4)
Oral base squamous cell carcinoma metastasis	-	4	4	
Submandibular gland low differentiated carcinoma metastasis	-	1	1	
Oral cavity minor salivary gland adenocarcinoma metastasis	4	-	4	
Invasive and basosquamous cell carcinoma metastasis	2	-	2	
Nasal cavity squamous cell carcinoma metastasis	1	-	1	
Distant organ metastasis	-	5		5 (7.1)
Well differentiated thyroid gland carcinoma metastasis	-	2	2	
Mammary, gastric, colon adenocarcinoma metastasis	-	3	3	
Brown tumor	-	1		1 (1.44)
Diffuse giant cell lenfoma	1	-		1 (1.44)
Adenoid cystic carcinoma	1	-		1 (1.44)
Total	35 (50.7)	34 (49.3)		69 (100)

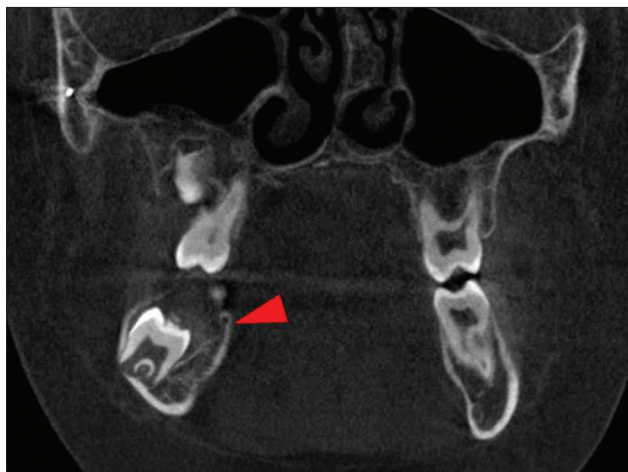


Figure 2: Wall of thin sclerotic odontogenic keratocyst associated with right mandible premolar tooth (red arrowhead)

The morbidity caused by delayed diagnosis or inadequate treatment may be high.^[4]

The most common odontogenic cyst is radicular cyst with 55%–74% and is usually observed in the anterior maxilla due to necrosis following pulp infection.^[1,5]

Radicular cysts are initially nonsempomatic and are detected incidentally on routine radiographs. As the cysts continue to grow, pain and swelling develop, with increased mass,



Figure 3: Clinical and intraoperative view of the right nasoalveolar cyst (arrowheads)

fluctuation, crepitation, and thinning of the bone cortex may be observed.^[6] The second most common cyst is dentigerous cyst originating from the implanted dental environment with a rate of 18%–24% and these has a higher risk of conversion to ameloblastoma. Treatment options include surgical drainage, marsupialization, curettage, enucleation, marginal resection, or segmental resection of the involved area.^[3] In a study of 274 cases by Baştoklu *et al.*, they found the most common cyst as 54.7% radicular cyst, followed by dentigerous cyst with

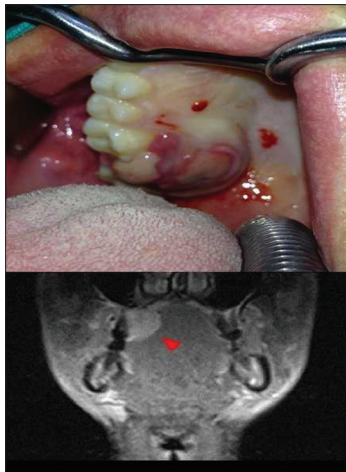


Figure 4: Clinical magnetic resonance imaging image of the right maxilla giant cell granuloma (arrowhead)

17.8% and odontogenic keratocyst with 12.4%.^[7] According to Ertem, radicular cysts were found most frequently in 65.7%, followed by dentigerous cysts with 15.7% and odontogenic keratocysts with 5.2% in their study.^[8] Another study was defined the most common cyst in the jaw as 32% radicular cyst, followed by dentigerous cyst with 24% and odontogenic keratocyst with 12%.^[9]

In our study, in accordance with the literature, radicular cysts were found most commonly with 43.47%, followed by dentigerous cysts with 34.78% and keratocysts with 8.6%. Enucleation and curettage were performed for treatment. However, as keratocysts have a high likelihood of relapse, chemical cauterization has been applied against cyst epithelial residues.^[10]

Nasolabial cysts are developmental non-odontogenic cysts. Açıkgöz et al. reported the rate of non-odontogenic cyst as 1.5% in the Turkish population.^[11] The etiology of nasolabial cysts is unknown. Approximately 90% are unilateral and 10% of the reported cases are bilateral.^[12,13] It is three times more common in women than in men and is frequently seen between the ages of 40–50. Of these cysts, which are rarely reported in the literature, we detected only nasoalveolar cysts in our cases. We think that this condition is effective in clinically referring to the ENT physician or referring them to dentists as a result of swelling or mass in the sublabial, gingivobuccal sulcus under the nose wing in the clinic. Recurrence is rare because these cysts can be removed surgically by careful sublabial approach to the gingivobuccal region.^[12-14]

Odontogenic tumors are a heterogeneous group of lesions with various clinical behavior and histopathological types, ranging from hamartomatous lesions to malignancy and they develop from dental ectomesenchymal or epithelial tissues.^[1] Odontogenic tumors are rare. In a retrospective clinicopathological analysis of 514 cases, odontogenic tumors were found in 14.39% (74/514), and odontomas and ameloblastomas were the most common tumor types.^[15]

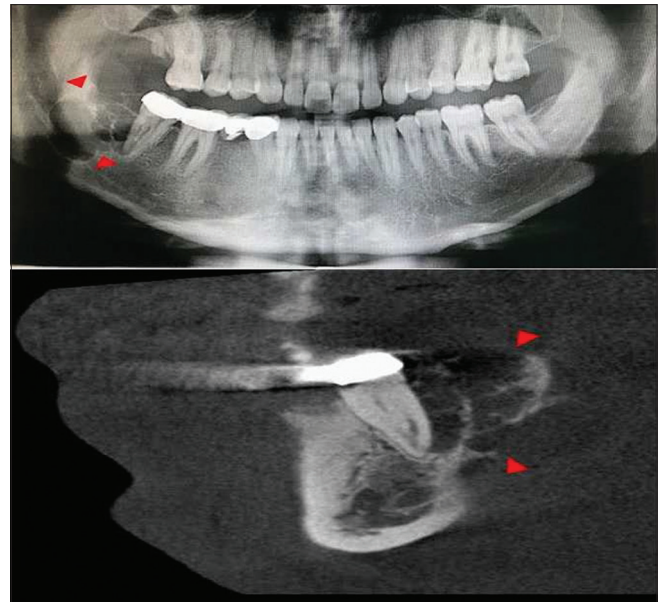


Figure 5: Images of ameloblastoma on right panoramic mandible X-ray (upper) and lateral X-ray (lower)

In our study, it was observed that the most common odontoma was followed by giant cell reparative granuloma and ameloblastoma. Giant cell granuloma has been reported in the mandible and maxilla. Complete excision of granuloma is important, otherwise, recurrence is inevitable.^[16,17] Enucleation or excision is sufficient in the treatment of odontomas and ameloblastomas since they do not cause local invasion and recurrence is rare.^[18]

Metastasis to the jawbones can be seen from surrounding tissues and distant organs. As the oral cavity is an easily accessible and consideration able area, it allows early recognition of metastases from other organs. On the other hand, in patients with maxillary and mandibular metastatic tumors that should not be ignored during oral cavity examination, the diagnosis is usually delayed. For this delay; rare findings, pain, loss of sensation, nonspecific findings, minimal radiological findings, and often the first manifestation of a tumor with no primary. Primary tumor sites that most commonly metastasize to the maxilla and mandible are lung, breast, ovary, prostate, kidney, liver, and thyroid gland and breast cancer. Since the hematopoietic tissue of the mandible is more than the other jaw bones, metastases especially in the hematogenous way are more common.^[19-22] In our study, 7.1% (5/69) of our patients had metastasis from various organs to the mandible. The primary sites of these metastases were from the breast, thyroid gland, stomach, and colon as indicated in the literature. Histopathological diagnosis of these metastases; thyroid follicular carcinoma and adenocarcinoma. In addition, metastasis to the mandible was detected in 4 cases of squamous cell carcinoma of the mouth and in one case of submandibular gland originating from primary tumors. All metastases to the maxilla consisted of tumors that developed as a result of the local spread of tumors such as nasal cavity,

maxillary sinus, and squamous cell carcinoma of the hard palate, adenocarcinoma, diffuse large B-cell lymphoma. In addition, as mentioned in the literature in one case, mandibular brown tumor secondary to increased parathormone activity due to secondary hyperparathyroidism. In this pathological event, osteoclastic activity increases and as a result of bone resorption, the bone is replaced by fibrous tissue known as brown tumor.^[19,22]

The evaluation of the oral cavity including the mandible and maxilla is the responsibility of all physicians, especially the ENT and dentists. A lesion in the oral cavity can be easy to detect, but it can be difficult to detect a lesion that is confined to the mandible and maxilla. In fact, these lesions can be detected by chance by radiological imaging. We should cooperate with dentists for dental restorations and controls on regular, periodic dental examinations for the proper treatment of odontogenic and non-odontogenic cysts without complications. Although there is tumor metastasis in the neighborhood of the mandible, we should also consider that it may be distant from the organs such as the breast, breast, kidney, and thyroid gland.

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Conflicts of interest

There are no conflicts of interest.

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