

## RELATIVE FREQUENCY OF ODONTOGENIC LESIONS BASED ON THEIR HISTOLOGICAL DIAGNOSIS

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### ABSTRACT

*Background and Objective:* Odontogenic cysts and ameloblastomas are the most commonly occurring lesions arising from odontogenic epithelium in the oral cavity. Clinical and radiographical findings have their limitations in correctly diagnosing these lesions which may significantly affect the treatment and prognosis of patients. Hence, histological diagnosis along with their classification is mandatory in these cases. This study was designed to see the relative frequency of histologically diagnosed odontogenic lesions in comparison to their provisional clinical diagnosis.

*Methods:* A total of 114 blocks containing odontogenic lesions along with their clinical records were acquired from Morbid Anatomy and Histopathology department at University of Health Sciences Lahore and a local private laboratory from year 2011 – 2015. Hematoxylin and Eosin staining was performed on section for final diagnosis.

*Results:* In a total of 114 patients, 32 (28.02%) differed in their initial clinical and final histological diagnosis. From a total of 32 lesions, 4 unicystic ameloblastomas were provisionally diagnosed as dentigerous cysts, 8 OKCs were provisionally diagnosed as multicystic ameloblastoma, 7 dentigerous cysts were provisionally diagnosed as radicular cysts, 4 OKCs were provisionally diagnosed as dentigerous cysts and 9 ameloblastomas were provisionally diagnosed as OKCs.

*Conclusion:* Owing to the propensity for misdiagnosis, all the cystic lesions from the oral cavity should be sent to the laboratory for their final diagnosis for better treatment and prognosis in these patients.

*Keywords:* Odontogenic cysts, Ameloblastoma, Dentigerous Cysts, OKCs, Radicular Cysts, Prevalance, histological diagnosis, radiographic diagnosis, misdiagnosis, unicystic ameloblastoma, multicystic ameloblastoma, relative frequency of odontogenic cysts, age range, female, male predominance, common site, prognosis, management of odontogenic cysts, odontogenic lesions.

### INTRODUCTION

Odontogenic cysts are the most commonly occurring cysts in the oral cavity arising from odontogenic epithelium and ameloblastoma is the most commonly occurring odontogenic tumour. They are sub-classified on the basis of their origin as developmental and inflammatory. Developmental odontogenic cysts comprise of odontogenic keratocysts, dentigerous cysts, lateral periodontal cysts, sialo-odontogenic cysts, eruption and gingival cysts.<sup>1</sup> The inflammatory type includes radicular/periapical, residual and paradental cysts. Commonly occurring amongst the odontogenic cysts (OC) are radicular cysts which constitute 54.6% of all OC. Dentigerous cysts, comprising of 20.6% and then odontogenic keratocysts making up to 11.7% of total OC.<sup>2</sup> A study of 268 cases of odontogenic cysts, conducted in Pakistan, revealed that periapical, dentigerous and odontogenic keratocysts are commonest, comprising 98.9% of all the odontogenic cysts.<sup>3</sup>

Radicular cysts are managed by either conserva-

tive nonsurgical endodontics of the associated tooth or extraction is carried out as an appropriate management after which there is no recurrence. The treatment of choice for dentigerous cyst is careful enucleation along with the removal of the associated tooth.<sup>4</sup> The prognosis is excellent. However, the epithelial lining of the dentigerous cyst may undergo neoplastic transformation to an ameloblastoma. It may also be transformed into squamous cell carcinoma or intraosseous mucoepidermoid carcinoma.<sup>5</sup>

Odontogenic keratocyst is managed by complete removal in one piece which is often difficult because it has a thin, friable cystic wall. Unlike other odontogenic cysts, odontogenic keratocysts tend to recur after enucleation. Other treatment options are marsupialization, and enucleation with allogeneic or xenogeneic bone grafting.<sup>4</sup>

Management and prognosis of ameloblastoma is variable, depending on whether it is peripheral and unicystic ameloblastoma, multicystic solid ameloblas-

tomas have a higher tendency of being aggressive and are more likely to recur after surgical excision.<sup>6</sup> It depends on the type and site of the tumour, but is usually by wide excision, preferably taking up to 1cm of clinically normal bone around the margin. Solid ameloblastoma has a recurrence rate of 25% – 55% whereas unicystic ameloblastoma has a recurrence rate of 5% – 10%.

Because of their relative frequency, odontogenic cysts should pose no diagnostic challenge, however they are often misdiagnosed due to many clinical and radiological similarities amongst them. Some of these cysts are aggressive and may recur, hence all the surgically removed tissues should be sent for histopathological examination.<sup>7</sup> This study was therefore designed to find out the relative frequency of clinically diagnosed odontogenic lesions in relation to the biopsy specimens received for final diagnosis.

## METHODS

A total of 114 blocks along with their clinical records were acquired from Morbid Anatomy and Histopathology department at University of Health Sciences Lahore and a private laboratory from year 2011-2015. The paraffin-embedded tissue blocks were cut into 4 µm sections. The sections were stained with haematoxylin and eosin stain for histological diagnosis. The clinical findings and provisional diagnosis were then compared with their final histological diagnosis.

## RESULTS

There was a male predominance noted with a male to female ratio of 1.2:1. There were 52 (45.6%) females and 62 (54.4%) males with most of the cases taking place in the third decade of age. Their mean age was calculated as 36.5 (± 10) years. Among the 114 lesions, 44 were diagnosed as ameloblastoma, 32 were dentigerous, 20 were OKCs and 18 were radicular cysts.

Diagnosis	Males	Females	Total
Radicular Cysts	10	8	18
Dentigerous cysts	14	18	32
OKC	11	9	20
Ameloblastoma	27	17	44

Amongst 44 cases of ameloblastoma, 17 were found in females and 27 were found in males. 18 of the dentigerous cysts were in females and 14 were in males. 9 keratocysts were found in females and 11 in males. 8 radicular cysts were found in females and 10 were in males.

Most of the odontogenic lesions (n=33) were recorded in the 3<sup>rd</sup> decade of life, followed by 4<sup>th</sup> decade (n = 28) and 21 lesions in the 5<sup>th</sup> decade. Below 20

years, 17 lesions were recorded and 15 were from the patients who were above 50 years of age.

Lower posterior site of the jaws, was the most predominant site for the odontogenic cysts and ameloblastoma (52.6%) (n = 60). 17.5% (n = 20) were found in upper posterior and 14.9% (17 each) were found in upper and lower anterior sites of the jaws, respectively.

Follicular variant of ameloblastoma was found predominantly with n = 24 (55%). Second commonly occurring was plexiform variant with n = 14 (32%), 4 (9%) were unicystic and 2 (5%) were desmoplastic type of ameloblastoma.

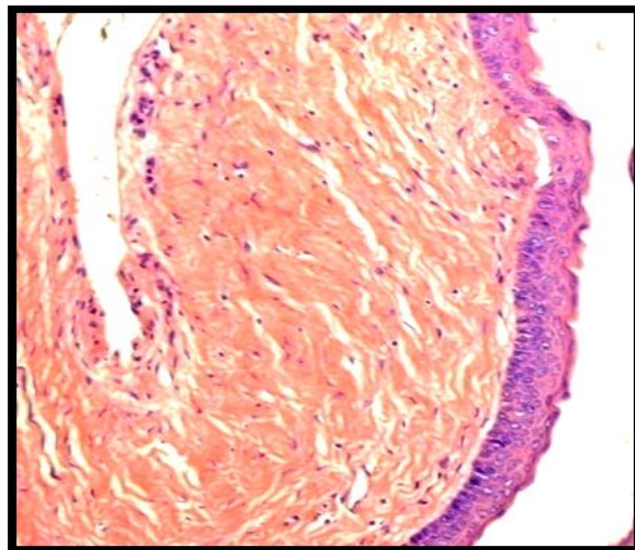
In a total of 114 lesions, 32 lesions (28.02%) were provisionally diagnosed as different lesions. On microscopic examination, 4 unicystic ameloblastomas were provisionally diagnosed as dentigerous cysts. Clinically, they presented as hard bony swellings in posterior mandible. Radiographically, they were unilocular, radiolucent and 3 of them involved impacted 3<sup>rd</sup> molar.

Among the 20 OKCs, 8 were provisionally diagnosed as multicystic ameloblastoma. Clinically, they presented as painless hard bony swellings, 3 in posterior maxilla, rest in posterior mandibular region. Radiographically, these lesions presented as multilocular radiolucencies. Among the 32 dentigerous cysts, 7 were provisionally diagnosed as radicular cysts. Clinicoradiographically, they presented as painful swellings in posterior and anterior maxilla and in posterior mandible. They were radiolucent and unilocular. OKCs (n = 4) were provisionally diagnosed as dentigerous cysts. Clinically, they all presented as hard swellings, 1 in posterior maxilla and 3 in mandible. Their radiography was noted as unilocular radiolucencies (Fig. 1). Nine ameloblastomas were provisionally diagnosed as OKCs. Clinicoradiographically, they were hard bony swellings in posterior mandible presented as multilocular radiolucencies involving one tooth or more (Fig.2).

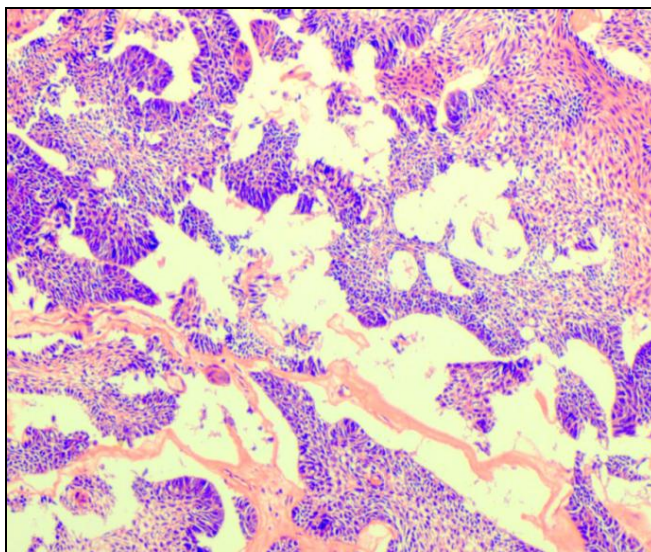
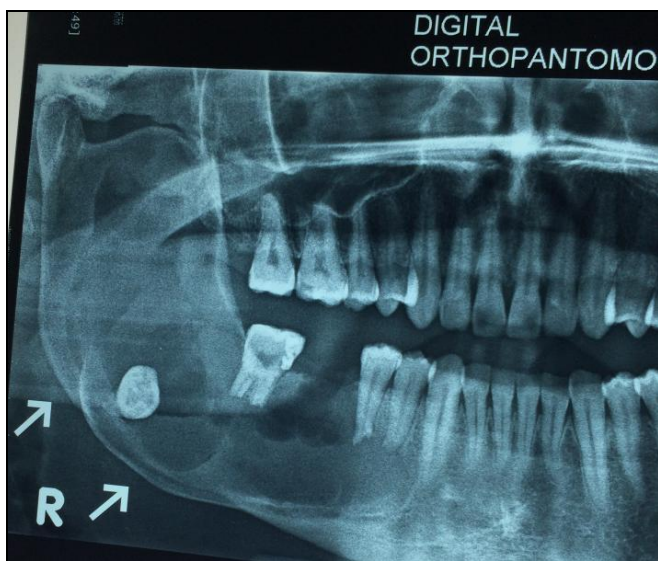
## DISCUSSION

Accurate diagnosis for the proper management of oral lesions is critical responsibility of an oral health-care provider. Fortunately, commonly presenting oral lesions are benign but they can also represent chronic mucosal disorders or malignant processes which may require extensive management.

In this study, male predominance (1.2:1) was noted as is also seen in many other studies. A study conducted in Karachi from 2001 – 2010 on 6000 samples, showed male predominance which was calculated as 62%.<sup>8</sup> In an Indian study of odontogenic cysts, conducted on 150 cases retrospectively, from a period of 2001-2011, has showed more cases in males having a male to female ratio of 1.38:1.<sup>9</sup> This predilection could be due to the fact that females are more concerned about their hygiene and health than males, the males are more able to report such lesions than females because of their exposure.



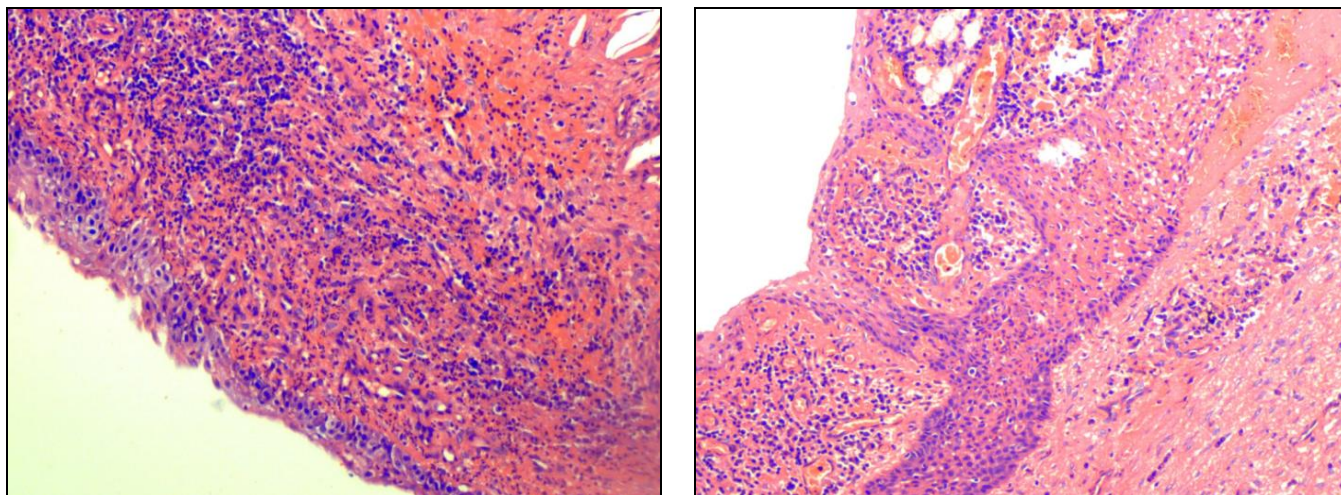
**Fig. 1:** Radiograph of a 34yrs old female showing well demarcated, unilocular radiolucency in right mandibular premolar area. On histology, it came out to be an OKC (200x).



**Fig. 2:** Radiograph of a 45yrs male with ill-defined, multilocular radiolucency in the right posterior of the mandible involving multiple teeth. On histology, it came out to be a follicular variant of ameloblastoma (200x) which was provisionally diagnosed as OKC.

Sr. No.	Number of Lesions	Provisional Diagnosis	Confirmed Final Diagnosis
1	4	Dentigerous cysts	Unicysticameloblastoma
2	8	Multicysticameloblastoma	OKCs
3	7	Radicular cysts	Dentigerous cysts
4	4	Dentigerous cysts	OKCs
5	9	OKCs	Ameloblastoma





**Fig. 3:** Radicular cyst (left) and dentigerous cyst (right) with extensive inflammation (200x).

Most cases were found in the 3<sup>rd</sup> decade of life followed by 4<sup>th</sup> decade in the present study. This finding is in accordance with an eight years retrospective study, from Rawalpindi, Pakistan, on cysts which showed peak prevalence in 2<sup>nd</sup> and 3<sup>rd</sup> decade of life.<sup>3</sup> In an Indian study, the mean age of the patients with odontogenic cysts is 32.2 years.<sup>9</sup>

The most common site, in present study, was lower posterior jaw in 52.6% of cases submitted for biopsy. In a study of 6000 odontogenic cysts and tumors in Dow University of Health Sciences Karachi, Pakistan, the most common location for cysts (51%) and tumors (68%) was posterior mandible.<sup>8</sup> This was in accordance with a mandibular to maxillary ratio of 3:1 in the Iranian study.<sup>10</sup>

Kondori and colleagues (2011) provided us with some data on the accuracy of dentists in making clinical diagnosis of oral lesions.<sup>11</sup> They reviewed the biopsy reports of 976 tissue specimens submitted to Oral and Maxillofacial department of Virginia Commonwealth University from January 2009 to January 2010 and found that almost half of the diagnoses (43%) made by the submitting clinicians, were incorrect.<sup>11</sup> In our study, we found 28% of clinical diagnoses were not correct after carrying out the histological studies of the respective specimens.

In a case report by Seema et al (2013),<sup>11</sup> OKC was misdiagnosed as dentigerous cyst which had its subsequent effects on the management of the cyst. Present study also reports 4 OKCs clinically diagnosed as dentigerous cysts. OKCs require more vigorous management than dentigerous as there are chances of recurrence which warrants an accurate diagnosis by the clinician.

Odontogenic lining has a propensity to be transformed into neoplastic lesions. Mild, moderate or severe dysplasia may be observed in the progressing stages of transformation. There have been some case stu-

dies in which the tumours arouse from the already existing odontogenic lesions. Two case reports of primary intraosseous tumour of the jaw arising in odontogenic cyst by Scheer et al (2004)<sup>12</sup> and Saito et al in Japan (2002)<sup>13</sup> warrant a definite histological diagnosis.

It is **concluded** that dental practitioners must not rely solely on their clinical diagnosis and all the cystic lesions from the oral cavity should be sent to the laboratories for their final histological diagnosis for better treatment and prognosis of the patients. In this way, the propensity of misdiagnosis of these lesions shall be minimized.

#### Authors' Contribution

SZ: Designed and conducted the study. NN: Helped in analysis of cases and preparation of manuscript. AHN: Did over all supervision and guidance of the project.

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