Original Article

# An analysis of Site-Specific Histopathological variation of the Lesion in Patient with Odontogenic Keratocyst of Jaw Bone

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*Abstract*

***Background:*** *Odontogenic keratocyst is one of the most invasive odontogenic cysts in the oral cavity. It is well known for its excessive growth in the affected area. This study was aimed to assess the site specific histopathological variation of the lesion in patient with odontogenic keratocyst of jaw bone*

***Method:*** *The observational type of cross-sectional study was conducted in the Department of Oral and Maxillofacial Surgery, Dhaka Dental College Hospital, Dhaka from 2014 to 2015. The study was done by 25 patients who were histologically diagnosed with Odontogenic keratocyst of the jaw. Samples were selected by convenient sampling technique. Data were collected through pretested semi-structured questionnaire & analyzed by using the statistical packages of social science (SPSS version 25)*

***Result:*** *The mean age of the total 25 patients was 23.56± SD years and ranges from 10 to 50 years. The highest proportions of patients (44%) were from less than 20 years of age and a few (8%) of them were from more than 41 years. The histological type was found 14(56%) as parakeratinization and 10(40%) as orthokeratinization. Parakeratinization was most frequently 12 (87.7%) found among females in the distribution while orthokeratinization was most frequently 7 (70%) found among males. The test was found statistically significant (P<0.05). Parakerateratinization types were most frequently 10(71.4%) seen where an impacted tooth was absent and orthokeratinization was most frequently 7(70%) observed with the presence of an impacted tooth. The test was not statistically significant (P>0.05)*

***Conclusion:*** *Knowledge about the histological presentation of odontogenic keratocyst is required to correct diagnosis and prognosis. The need for improved diagnostic facilities and experienced oral pathologists is momentous in Bangladesh for this purpose.*

***Keywords:*** *Histological behavior, Odontogenic keratocyst, Oral lesions, Site-specific.*

## Introduction

Odontogenic keratocystic (OKC) is well known for its progressiveness and desire to obliterate the adjacent tissues and bone. Odontogenic keratocyst (OKC) was first described in 1876 and was named by Philipsen HP in 1956.[1] They are developmental odontogenic cysts of epithelial origin, primarily raised from primordial odontogenic epithelium (dental lamina or its remnants), odontogenic basal cell (enamel organ).[2] Robinson first popularized the term in 1945.[3] Usually, odontogenic keratocyst occurs as solitary lesions in the jaws of healthy individuals showing a high incidence of recurrence if not appropriately removed. Extending forwards into the body and upwards into the ramus, odontogenic keratocysts may occur in any part of the jaw. Being a benign character, OKC is locally aggressive with the majority occurring in the mandible commonly in the angles of mandible. They maybe single generally, ever multiple in number which may be associated with Gorlin-Goltz syndrome. Sometimes, it is associated with basal cell nevus syndrome.[4] Cases ranging from 5 to 80 years of age are most commonly affected by the lesions. Male are more sufferer than female as the average age of males was 9.7 years older than that of females.[5] Except in children the male to female ratio is 1.3 to 1. The cysts composed of thin wall lined by a regular keratinized stratified squamous epithelium which is normally 5 to 8 cell layers thick and is cast-off rete pegs.[6] According to keratin formed by the epithelium, the cysts has two variants– a) parakeratin – (presence of nuclei) b) orthokeratin- (absence of nuclei). Between this two variant, the parakeratinized seems to have a much higher incidence of recurrence when observe clinically. The enucleated lining detached from the underlying connective tissue at ease. The capsule is thin throughly and normally devoid of inflammatory cells and may contain stands of ondongenic epithelium similar to the dental lamina, cell nests along with daughter cysts. The OKC is a histopathologically and behaviorally unparalleled, specific existence. It is not most aggressive of the all odontogenic cysts and resembles both a cyst and a benign tumor. Most of the cases (60%) arises from dental lamina or from the basal cells of the oral epithelium and thus primordial origin odontogenic keratocyst takes place. The remaining 40% emerge from reduced enamel epithelium of the dental follicle and thus dentigerous origin odontogenic keratocyst occured. This histopathological identification has some dignity because

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recurrence is more often noticed after treatment of the primordial origin type. Histologically orthokeratotic shows clinically less rescurrence. To assess the clinical radiological and histological correlation of odontogenic keratocysts of jaw bones.

**Materials and Methods**

The observational type of cross-sectional study was conducted in the Department of Oral and Maxillofacial Surgery, Dhaka Dental College Hospital, Dhaka from 2014 to 2015. Patients were histologically diagnosed as a case of Odontogenic keratocyst, attending OPD and indoor of Oral and Maxillofacial Department of DDCH, during this study period, irrespective of age and sex. The study was done by 25 patients who were histologically diagnosed with Odontogenic keratocyst of jaw. Samples were selected by convenient sampling technique. Data were collected through pretested semi structured questionnaire. Patients histologically diagnosed as of odontogenic keratocyst of jaw were included & patients whose clinical presentation was like but histologically Odontogenic keratocyst not confirmed were excluded from the study. Since this is a cross-sectional observational study, there was no physical risk to the patients throughout the study period. All patients had a case number to maintain their confidentiality. No information was withheld from the patient. Informed written consent was taken from every patient explaining the nature and objectives of the study. Finally, the ethical committee of Dhaka College had given the ethical clearance for this study. Data were analyzed by using the statistical packages social science (SPSS version 25) and Microsoft Excel and the overall findings are presented in this chapter through tables and figures. Surgical procedure: Under local anesthesia incisional biopsy was done. The surgical specimen was fixed in 10% formalin and sent for histopathological typing.

**Results**

The mean± SD age of total 25 patients was 23.56± years and ranges from 10 to 50 years. The highest proportions of patients (44.0%) were from less than 20 years of age and a few (8.0%) of them were from more than 41 years. The study showed that, 20 (80%) were male and 5(20%) were female. It was found that male patients were found more than female patients.

**Table 1: Socio-demographic status of the respondents**

| Socio-demographic characteristics | |
|---|---|
| Age | |
| Less than 20 years | 44.0% |
| more than 41 years | 8.0% |
| Mean±SD | 23.56±SD (10-50) |
| Sex | |
| Male | 20 (80%) |
| Female | 5 (20%) |

**Table 2: Histological type of the lesions**

| Histological type of the lesions | Frequency n(%) |
|---|---|
| Parakeratinization | 14(56%) |
| Orthokeratinization | 10(40%) |
| Both | 1(4%) |

Table 2 showed that among the respondents, the histological type was 14(56%) as parakeratinization and 10(40%) as orthokeratinization.

**Table 3: Association between histological types and sex of the patients**

| Histological type | Sex of the patients n(%) | | Total | $X^2$ | P- Value |
|---|---|---|---|---|---|
| | Male | Female | | | |
| Parakeratinization | 2(14.3) | 12(87.7) | 14(56) | 8.45 | 0.02 |
| Othokeratinization | 7(70) | 3(30) | 10(40) | | |
| Both | 0(0.0) | 1(100) | 1(4) | | |

Table 3 revealed that parakeratinization was most frequently 12 (87.7%) found among females in the distribution while orthokeratinization was most frequently 7 (70%) found among males. The test was statistically significant (X2 = 8.45, p= 0.02).

**Table 4: Association between histological types and impacted tooth of the respondents**

| Histological type | Association of impacted tooth n(%) | | $X^2$ | P- Value |
|---|---|---|---|---|
| | Present | Absent | 5.14 | 0.07 |
| Parakeratinization | 4(28.6) | 10(71.4) | | |
| Orthokeratinization | 7(70) | 3(30) | | |
| Both | 1(100) | 0 | | |

Table 4 showed that parakerateratinization types were most frequently 10(71.4%) seen where an impacted tooth was absent and orthokeratinization was most frequently 7(70%) observed with the presence of an impacted tooth. The test was not statistically significant (X2= 5.14 p= 0.07)

**Table 5: Difference between provisional and histological diagnosis of the patients (n+25)**

| Parakeratinization | Histological diagnosis n(%) | Provisional diagnosis n(%) |
|---|---|---|
| | 14(56%) | 18(72%) |
| Orthokeratinization | 10(40%) | 7(28%) |
| Both | 1(4%) | 0 |

Table 5 showed that, 18(72%) respondents were provisionally diagnosed with parakeratinization but 10(40%) were histologically diagnosed with Orthokeratinization.

**Discussion**

The odontogenic keratocyst (OKC) is officially acquainted as the keratocyst odontogenic tumour (KCOT). It refers to an uncommon benign tumor originates from dental primordial.[7] The developmental odontogenic cysts appear once in a while in the jaw bones as compared to inflammatory cysts.[6,8] In the present study, the average age of 41 years at the time of diagnosis was found.[9] while another study reported that the majority of the patients were 21 to 30 years of age.[10] In this study, there was similarity with our series in which half of the patients were young. The highest proportions of patients (44.0%) were less than 20 years of age and a few (8.0%) of them were more than 41 years. Moreover, a study was conducted on 18 cases of odontogenic keratocyst with a mean age of 69.9 years, which is much higher than for odontogenic keratocyst.[11] Concerning the sex distribution, the present investigation showed that males were affected more than females. This study showed that 20(80%) were male and 5(20%) were female. It was found that male patients were higher than female patients. The male-female ratio in the study was 4:1. A similar male predominance was found in two studies.[11,12] This finding is in contrast with a study.[7] The histopathological characteristic of the odontogenic keratocyst had been well defined and was widely recognized its epithelial lining was generally a uniform thickness and usually parakeratinized when an orthokeratinized type also occurs. It exhibited a clear palisade basal layer of the hyperchromatic cells. The connective tissue wall often showed small islands of the epithelium; some of these islands might be small cysts called "daughter cysts."[13] In this study, there was 14(56%) perakeratinization, and 10(40%) of them were orthokeratinization and only 1(4%)was both body type. Parakeratinization was most frequently 12(87.7%) found among female in the distribution while orthokeratinization were most frequently 7(70%) found among male. The test was found statistically significant (X2 = 8.45, p= 0.02). Parakerateratinization types was most frequently 10(71.4%) seen where an impacted tooth was absent and orthokeratinization was most frequently 7(70%) observed with the presence of an impacted tooth. The test was not statistically significant (X2= 5.14 p= 0.07) Out of total 25 patients, 18(72%) respondents were provisionally diagnosed as parakeratinization but 10(40%) was histologically diagnosed as Orthokeratinization. The recurrence rate is high in parakeratosis than orthoketosis.[14,15] The purpose of this study is to find & correlate the incidence and histopathological variation of odontogenic keratocyst. Some information is valuable to clinicians as it helps in the formulation of a working diagnosis and timing management decisions and approach to treatment. This is a single hospital-based prospective observational study that may not reflect the actual clinicopathological scenario of this tumor. A Representative Multicentre study is required with a large sample size is recommended.

**Conclusion**

Variations in histopathological features make a diagnosis of odontogenic keratocyst difficult and when associated with syndromes, diagnosis becomes more difficult or confusing. A study on their prevalence with the distribution of histological type would help the clinicians to categorize odontogenic keratocyst into groups for further management. The parakeratotic type accounts for the majority of KCOTs and had greater potential for local destruction and extension into adjacent tissues, recurrence, and multiplicity. On this basis, a decision might be taken about treatment modalities for this tumor to curtail the recurrence.

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