

# HISTOPATHOLOGICAL TYPES OF ODONTOGENIC KERATOCYST — A STUDY

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## ABSTRACT

*Odontogenic keratocyst (OKC) is the most aggressive odontogenic cyst with a high recurrence rate. They are the most common jaw cysts of odontogenic origin. The histopathological variants are parakeratinized, orthokeratinized and combination of the two. The present study is a descriptive retrospective study conducted to evaluate the histopathological variants of OKC. This study was carried out on biopsy specimens over a period of 4 years. 37 patients were included in the study. Age range of the patients was from 14-63 years with the mean age of 35.5 years SD ±11.73. The most common age group of patients was in the 3rd decade of life with 65% males and 34% females. The most common site of occurrence of OKC was the angle of the mandible 40%, anterior mandible 20%. Parakeratinized OKC were predominantly common histopathological type in the region. Malignant transformation was reported in one of the patient of OKC.*

**Key Words:** *Khyber College of Dentistry, Odontogenic Keratocyst. Parakeratinized, Orthokeratinized.*

## INTRODUCTION

Odontogenic keratocyst are odontogenic cyst of epithelial origin first identified in 1876 derived from the remnants of the dental lamina.<sup>1</sup> As compared to other cysts of the jaw they have an unusual characteristics of high recurrence rate, aggressive behaviour and distant clinical features and its association with nevoid basal cell carcinoma syndrome.<sup>2</sup> The odontogenic keratocyst was previously called primordial cyst in 1992 but the world health organization termed the cyst as odontogenic keratocyst because of the keratinized lining and histological pattern.<sup>3</sup>

Three histopathological types of lining of odontogenic keratocysts were identified as parakeratinized, orthokeratinized and the combination of both of the variants.<sup>4</sup> These lesions are asymptomatic until they grow in size and show symptom's like displacement of teeth, swelling of jaws, overlap of the cyst on adjacent structures. Pain is also a feature if there is secondary infection and fracture. OKC account from 3-11% of the odontogenic cysts of the jaw, any age group is affected with this diseases but the common age is between 4th

and 5th decade of life.<sup>5</sup> These lesions are commonly found in the mandible with the common site being the angle of the mandible and the ramus and maxillary sinus and floor of the orbit are the sites in the maxilla. Peripheral manifestation include the canine area and buccal gingiva around the canine area. The lining of odontogenic keratocyst is parakeratinized with lining which is 5-19 cells thick with columnar cells present in the basal cell layer having a palisaded nuclei with a superficial corrugated layer, connective tissue capsule show blood vessels and collagen fibres. satellite cells are present in the capsule. the lumen contain fluid and proteins.<sup>6</sup>

The orthokeratinized variant of the odontogenic keratocyst also called orthokeratinized odontogenic cyst (OOC) arises from the rests of the dental lamina. This variant of OKC was described first by Schultz in 1927 and is now called keratocystic tumour due to its histopathological variant.<sup>7</sup> 3rd and 4th decade of life with males affected more than females with a mean age of 33 years. OOC is an incidental finding during radiographic examination.<sup>8</sup>

## METHODOLOGY

This Retrospective study was conducted in department of oral and maxillofacial surgery after the approval from the department/hospital review board. The study duration was of 4 years i.e., from October 2013 to September 2016. The charts of the patients were reviewed from the department of oral and maxillofacial Surgery record room for the period mentioned. The objective

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of the study was to determine the histopathological types of odontogenic keratocysts. The age, gender of the patient along with the histopathological types were recorded from the department charts/records. The data so collected was entered in the SPSS version 20 and was presented in the form of tables and figures.

**RESULTS**

A total of 37 patients were recruited in the study. Hospital maxillofacial surgery department admission charts were reviewed. The age, gender, site distribution and histopathological variants of OKC were evaluated. The histopathology reports were categorised as para or orthokeratinized odontogenic keratocysts. The most common age group was third and fourth decade of life i.e. 30% and 21.6% respectively the rest of details are given in Table 1. The age range of the patient was 14-63 years with the mean age of 35.5 years SD ± 11.73. Males were more commonly affected as compared to females with a male to female ratio of 1.3:1 Fig 1. Para-

TABLE 1: AGE DISTRIBUTION IN PATIENTS

S. No.	Age in years	Number of patients	Percent-age
1	11-20	4	10.8%
2	21-30	8	21.6%
3	31-40	11	30%
4	41-50	9	24.3%
5	51-60	4	10.8%
6	61-70	1	2.7%
Total		37	100%

TABLE 2: HISTOPATHOLOGICAL TYPES OF OKC

S. No.	Histopathological types	No. of patients	Percent-age
1	Parakeratinized	28	75%
2	Orthokeratinized	8	21.6%
3	Malignant variant	1	3%
Total		37	100%

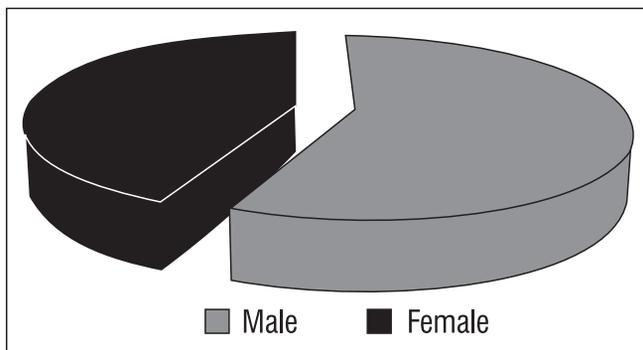


Fig 1: Gender distribution of OKC patients

keratinization is the most common histological pattern of odontogenic keratocyst (OKC) in the region. One 63 years old male patient also reported with malignant transformation in the cyst lining.

**DISCUSSION**

Odontogenic keratocysts are the most aggressive odontogenic cysts of the oral cavity and they have a high recurrence rate, these cysts are classified according to their histopathological behaviour and lining of the epithelium as parakeratinized, orthokeratinized and combination of the two.<sup>9</sup>

Odontogenic keratocysts occur in all age groups but the most common age group is second and fourth decade of life where they are frequently found while in my study the age starts from 4 years and goes to 50 years and is more common in the 3rd decade of life so variation occur in age. And are common on the ramus of the mandible and angle of the jaw. Geographically OKC is more common in European countries with male to female predominance of 1.6:1, but according to the study conducted by Chirapathomsakul et al there is more female predominance then males, with a female to male ratio of 2.2:1.<sup>10</sup>

Clinically Swelling and fluid discharge are the most common presenting complaint of patients coming with OKC i.e., 36.6% and 23.3% of the patients respectively according to studies conducted by Khan et al. Patient complains of limited mouth opening due to the unusual site of OKC which was in the coronoid area.<sup>11</sup>

Radiographically OKCs can be seen as both unilocular and multilocular radiolucency's. The unilocular radiolucency can be difficult to differentiate from other odontogenic or nonodontogenic cysts and when there is multilocular variant of OKC that can't be distinguished from odontogenic tumours like ameloblastomas.<sup>12</sup>

Histologically the WHO (1992) classified the OKC into three variants parakeratinized, orthokeratinized and combination of the two. The parakeratinized type of OKC was associated with nevoid basal cell carcinoma syndrome. The parakeratinized lining of the parakeratinized variant of OKC is of uniform thickness which is 5-8 cells thick, dysplastic changes are seen in this layer. The basal cell layer has cuboidal cells which lack rete ridges, the cyst lining has buddings and is much folded. Satellite cysts are present in the wall, inflammatory cells are typically absent or scanty .in inflammatory conditions the fibrous capsule thickens cause ulceration and keratinization disappears.<sup>13</sup>

OOC (orthokertinized odontogenic cyst) is a developmental cyst with which is more common in the 4th decade of life, males are more frequently affected then females.<sup>14</sup> orthokeratinized variant shows orthkeratinization, a squamous basal layer, a granular layer and keratin present in the cyst. In case of inflammation the

infiltrate has metaplastic epithelium in the cyst which gives rise to stratified non keratinized epithelium. In 2005 the parakeratinized cysts were redefined and renamed as keratocystic odontogenic tumour because of its higher mitotic activity, the orthokeratinized type becomes part of the odontogenic cysts.<sup>15</sup>, according to the study of Ruthin in the conducted on the variants of OKC the parakeratinized variant has 42.6% higher recurrence rate then 2.26% in orthokeratinized variant. Previous studies by Todd et al showed that in 449 patients 86.2% had parakeratinized variants and 12.2 had orthokeratinized variants. And in my study conducted on 37 patients, 28 were parakeratinized and 8 were orthokeratinized. The recurrence rate of parakeratinized variants are higher as compared to orthokeratinized variants.

**CONCLUSIONS AND RECOMMENDATIONS**

Para-keratinization in the cyst lining was the most common pattern seen in our population of patients .we need a bigger sample and more follow up studies as the sample size in the present study was 37 patients.

Such studies will be conducted in future as well to support these histopathological findings. OKC is an aggressive odontogenic cyst with a high recurrence rate, frequent follow up of these patients is of paramount importance to avoid surgical morbidity associated with delayed diagnosis.

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**3 Nadia Mansoor:** Literature search.