



Relative frequency of odontogenic and non-odontogenic cysts – A retrospective analysis of 145 cases

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General Note

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ABSTRACT

Background: The purpose of this study is to determine the frequency of distribution of odontogenic cysts and non odontogenic cysts in Odisha based population. **Methods:** A retrospective study was carried out and 145 cases of cysts were selected and were analyzed for demographic data. **Results:** 106 of the 145 cases of cysts, classified as cysts of odontogenic origin classified and non odontogenic origin. In the odontogenic cysts the most common are - Radicular Cysts (47%) with OKC (28%) and then DC (18%). **Conclusion:** Our study attempted in showing various types of cysts both odontogenic and non odontogenic type in the people residing in Odisha, which till now is rarely reported. It helps us to know which type of odontogenic cyst/non odontogenic cyst is most prevalent in Odisha population and suggesting the wide range of involvement OC and non OC in respect of age, gender and site.

Keywords: Odontogenic cysts, Non odontogenic cysts, Radicular Cysts

1. INTRODUCTION

Cyst can be defined as a pathologic cavity which is formed by accumulation of fluid, semifluid or gaseous substance but not by pus. Cystic cavities are normally lined by an epithelium whereas there are few cysts without the lining. Odontogenic cysts (OC) are the cyst derived from dental apparatus. They are classified depending on their origin as developmental and inflammatory. OCs occurs commonly in the oral and maxillofacial region from epithelium of odontogenic origin and the residuals that are entrapped into the bone or gingival (Avelar et al., 2009). Inflammatory cysts are associated with inflammation whereas developmental cysts are of unknown origin (Gay-Escoda et al., 2010). Most common among OCs are radicular and dentigerous cysts and are easy to diagnose (Jones et al., 2006). As most of the cysts share many common clinical and radiological features misdiagnosis is quite likely. Few of these cysts demonstrate biologically aggressive behaviour for which it becomes essential to do proper diagnosis and hence histopathological assessment of the excised tissue is a must for accurate diagnosis (Kaplan et al., 2005). This can aid in exact diagnosis and hence decide the appropriate treatment. Odontogenic cysts are believed to be derived from the proliferation of odontogenic epithelium followed by cystic degeneration (Jones et al., 2006 & Kaplan et al., 2005). Proliferations of non-odontogenic epithelial remnants are responsible for the formation of non-odontogenic cysts (non OC) (Mosqueda Taylor et al., 2002). There haven't been many studies after the latest WHO classification of odontogenic lesions in 2017 which has several modifications of odontogenic cysts and tumors. According to this OKC, this was earlier classified as KCOT by WHO in the year 2005 in which it has been reclassified into cysts (Soluk et al., 2017). Although many studies on prevalence of odontogenic cysts that have been carried out in a number of countries before, not many studies have been carried out to see the relative frequencies of odontogenic as well as non odontogenic cysts together after the latest WHO classification of 2017. Hence we have attempted to see the relative frequency of odontogenic cysts with that of the non odontogenic cysts. The Odontogenic and non-odontogenic cysts illustrated the frequency rates relatively varied, histogenesis, the behaviour biologically, as well as the features clinically. Few of such cysts exist as slow growing, harmless, but others act as destructive and aggressive pattern (Jones et al., 2006). The cysts in the jaw with the behaviour histologically is correlated towards the aggressiveness or/& recurrence of its development (Avelar et al., 2009). This study aims at frequencies for various odontogenic and non odontogenic cysts in Odisha population which are diagnosed histopathologically. Clinical assessment is done in accordance with the gender, affected site and age respectively.

2. METHODOLOGY & MATERIALS

A total of 145 cases of cysts were selected and were analyzed for demographic data which were investigated and included in this study. The already existing histopathological slides of diagnosed OC, non OCs were classified as per standard cyst classification World Health Organization (WHO) 2017 classification histologically (Soluk et al., 2017). The clinical details of all cases were obtained from the biopsy records which included age, gender and anatomic location etc.

Study Design

This is a retrospective, demographic study to access the frequency of odontogenic and non odontogenic cysts among patients in Odisha particularly visiting the private hospitals and dental clinics. Random sampling was used and all the recorded cases constituting of odontogenic and non- odontogenic cysts between the time period of January 2011 to December 2019, and relative frequency of distribution of the cysts were obtained.

Study Setting

This study was abstracted from Odisha, India. The data analyzed for the present study was accumulated from private hospitals and some dental clinics from Odisha based population.

Study Population

The study comprised of population from Odisha taken from the records of odontogenic and non odontogenic cysts. The cysts included for the study were histopathologically confirmed and then classified as per standard cyst classification by. A total of 145 cases of cysts were selected and were analyzed for demographic data which were investigated and included in this study. Histological interpretation is must to confirm the particular cyst and for correct surgical treatment and follow up of patient. In our study all histopathological confirmed cases has been included example Fig-10(i),(ii),(iii) and Fig-11(i),(ii),(iii). The patient record which have only radiological presentation and not confirmed diagnosed histopathologically, has been excluded from study.

Data analysis

All demographic data has been collected and tabulated. Data were analyzed by statistical package software SPSS.

3. RESULTS

Among 145 oral cases were retrieved from the patients with OC and non OC from private clinic and hospitals of Odisha based population. Of this total, 106 cases (73%) has been identified as odontogenic cyst & total cases numbering to thirty nine (27%) has been identified as non OC. This largest diagnostic group among odontogenic cysts was that of Radicular cysts: 50 (47%) followed by OKCs: 30 (28%) and then DCs: 19 (18%). Largest group in the non odontogenic group was that of the mucous extravasations cyst: 28 (69%) followed by nasopalatine cysts: 5 (12.8%). The demographic details are given in the table below (Table 1-6 and Fig1-9).

Table 1 Relative frequencies of different odontogenic cysts

DIAGNOSIS	NUMBER	% of frequency	MALE	FEMALE	M:F	AGE RANGE	AGE±SD
RC	50	47%	24	26	12:13	13-75	32.9±14.7
OKC	30	28%	16	14	8:7	10-60	33±14.4
DC	19	18%	14	5	2.8:1	5-47	23.6±11.9
RESI CYST	2	2%	1	1	1:1	27-33	30±3
LAT PER CYST	1	1%	0	1	1:0	58	58±0
GOC	1	1%	1	0	1:0	49	49±0
COC	3	3%	1	2	1:2	11-40	29.3±15.9

Table 2 Relative frequencies of different non odontogenic cysts

DIAGNOSIS	NUMBER	%	MALE	FEMALE	M:F	AGE RANGE	AGE±SD
MUCOUS EXTRAVASATION CYST	28	72%	13	15	13:15	6-56	29.2±16.8
NASOPALATINE	5	12.8%	4	1	4:1	45-55	46±5.4
NASOLABIAL	1	2.5%	1	0	1:0	40	40±0
PERIODONTAL	1	2.5%	1	0	1:0	45	45±0
PSEUDO CYST	1	2.5%	0	1	0:1	30	30±0
MUCOCELE	2	5%	2	0	2:0	17-32	24.5±7.5
ABC	1	2.5%	0	1	0:1	42	42±0

Table 3 Distribution of all cysts according to histopathology, gender & age of affected patients

DIAGNOSIS	NUMBER	%	MALE	FEMALE	M:F	MEAN AGE±SD
Odontogenic cyst	106	100	57((54%)	49(46%)	1.2:1	31.1±14.2
Non-odontogenic cyst	39	100	21(54%)	18(46%)	7:6	32±15.6

Table 4 Shows the odontogenic cysts distributed as per World Health Organization in 2017

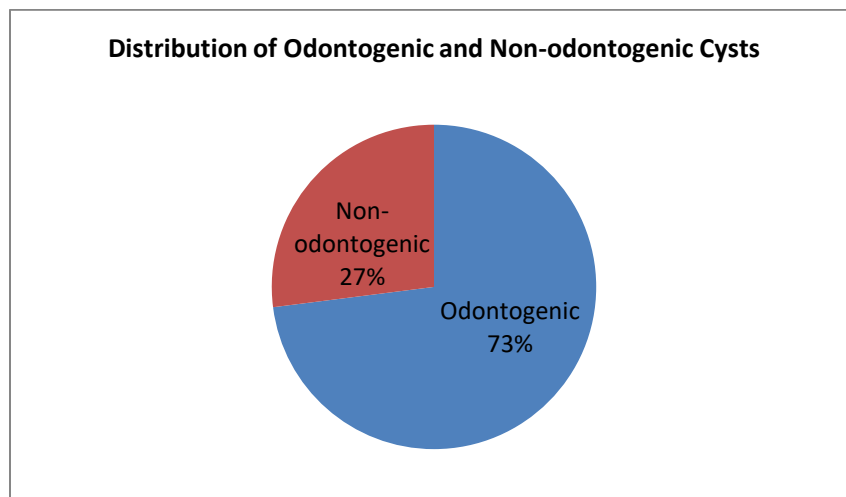
DIAGNOSIS	NUMBER	GROUPWISE % (Developmental & Inflammatory cyst group)
DEVELOPMENTAL CYST (54cases)		
DC	19	35%
OKC	30	55.5%
LATER PERIO	1	1.9%
GOC	1	1.9%
COC	3	5.6%
INFLAMMATORY CYST (52cases)		
RC	50	96%
RESI CY	2	4%

Table 5 Site distribution of common odontogenic cysts

ODONTOGENIC Cyst	Maxilla,(n=55)		Mandible, (n=44)	
	Anterior	Posterior	Anterior	Posterior
RC (50)	26(52%)	9(18%)	6(12%)	9(18%)
OKC (30)	1(3%)	10(33.3%)	6(20%)	13(43.3%)
DC (19)	6(31%)	3(15%)	0(0%)	10(52%)
TOTAL	33(33.3%)	22(22.2%)	12(12.1%)	32(32.3%)

Table 6 Site distribution of most common non OC (mucous extravasations cyst)

SITE	NUMBER	M	F
LIP	21(77.8)	6(22.2)	15(55.6)
BUCCAL M	2(7.4)	1(3.7)	1(3.7)
VESTIBULE	2(7.4)	1(3.7)	1(3.7)
FLOOR OF MOUTH	1(3.7)	0	1(3.7)
TONGUE	1(3.7)	0	1(3.7)

**Figure 1** Relative frequencies of odontogenic and non odontogenic cysts

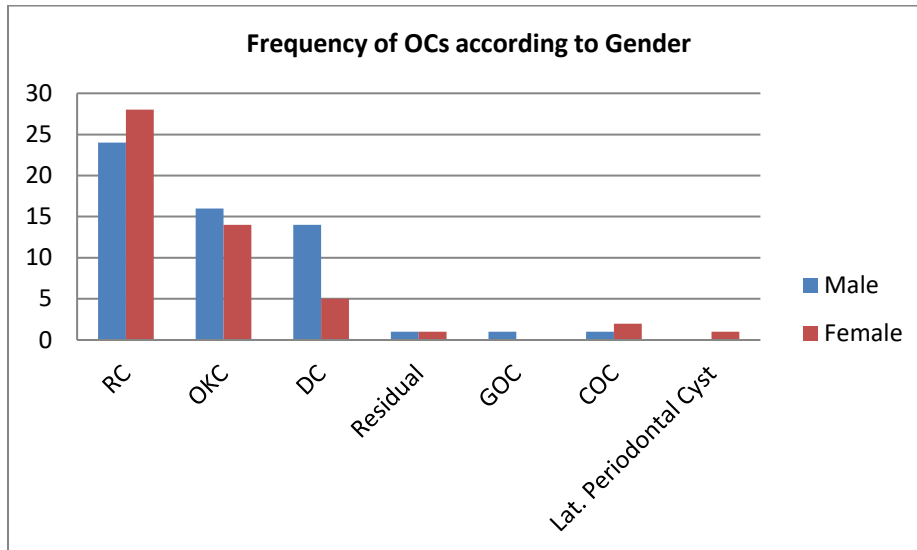


Figure 2 Frequencies of various odontogenic cysts

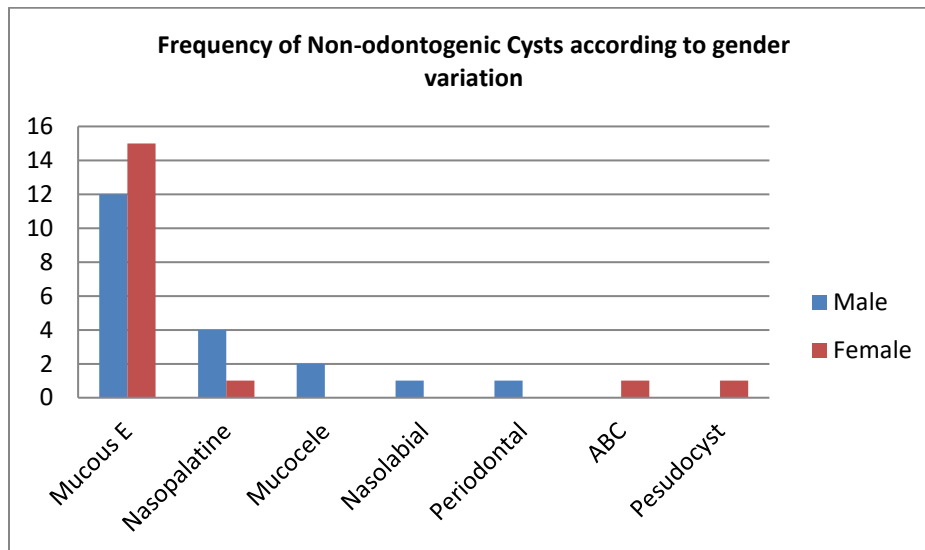


Figure 3 Distribution of non odontogenic cysts

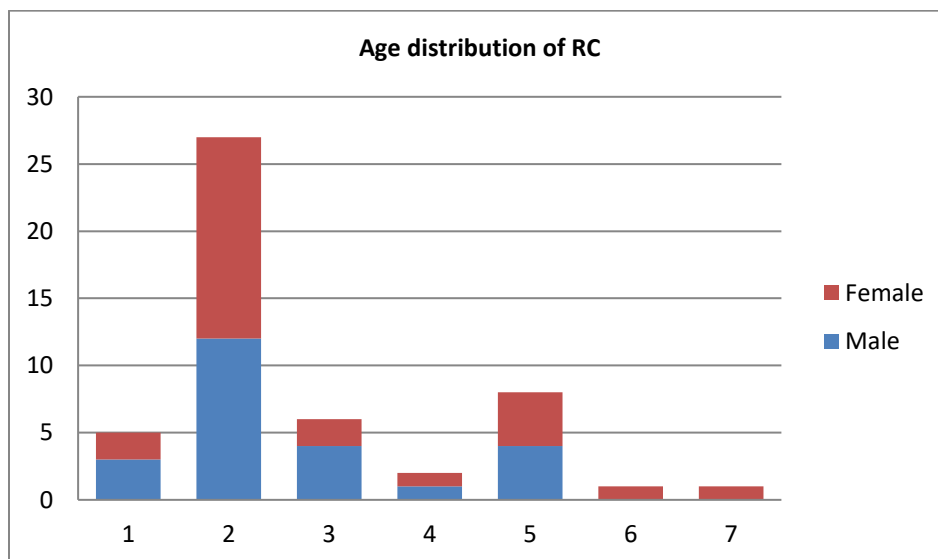


Figure 4 Age distribution of RCs

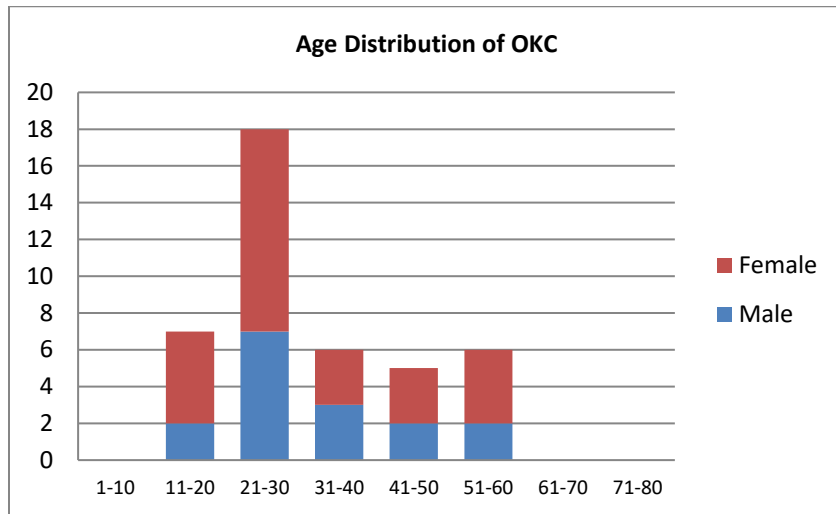


Figure 5 Age distribution of OKC

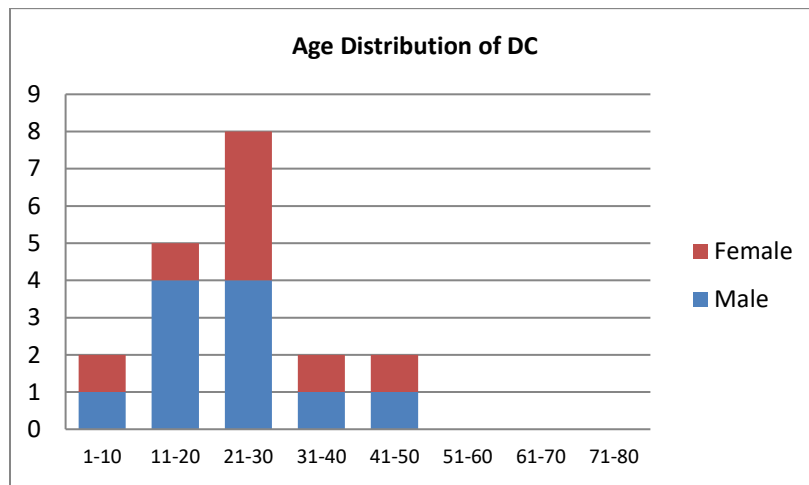


Figure 6 Age distribution of DC

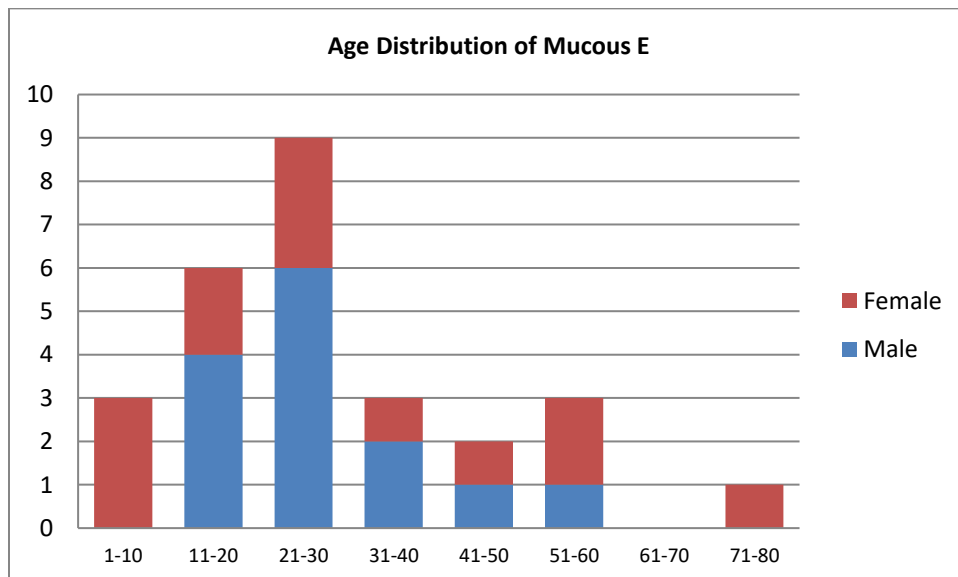


Figure 7 Age distribution of mucous extravassation cyst

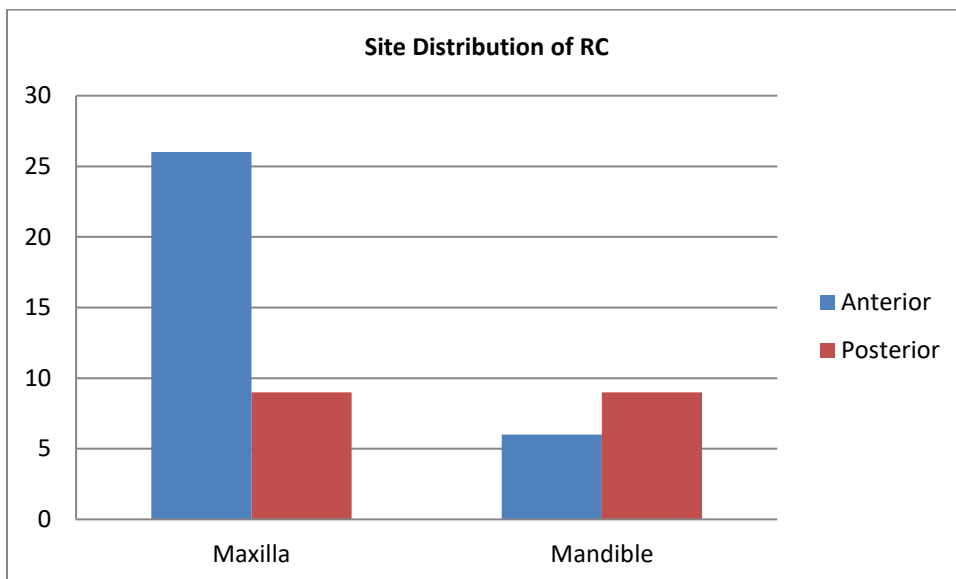


Figure 8 Site distribution of most common odontogenic cyst (RC)

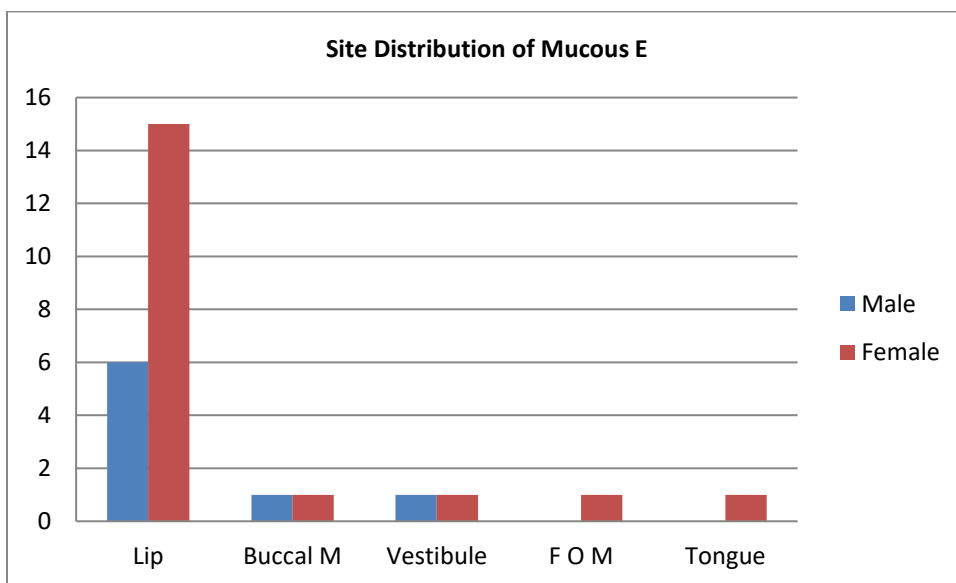


Figure 9 Site distribution of most common non odontogenic cyst (mucous extravassation cyst)



Figure 10(i) Showing Radiographic View of Odontogenic Keratocyst

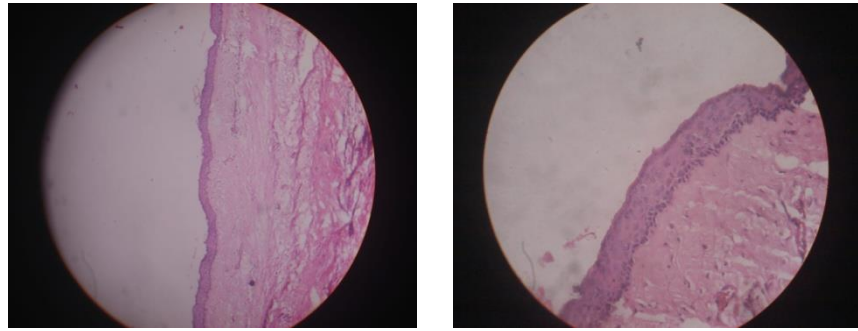


Figure 10 (ii) & (iii) Showing histological view of Odontogenic Keratocyst



Figure 11 (i) Showing radiological view of Dentigerous Cyst

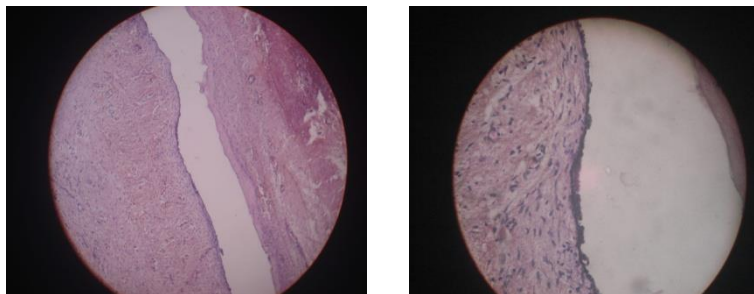


Figure 11 (ii) & (iii) Showing Histological view of Dentigerous Cyst

4. DISCUSSION

The odontogenic cysts are abundantly informed in the literature but in Odisha based population this study is very less. In most cases, studies are small in nature as epidemiological and demographic data are not available (Brendum et al., 1991; Browne et al., 1970; Carter et al., 1996). As the jaw cysts share a number of common clinical and radiological features it is wise to know the incidence, site of occurrence, age distribution of all OCs and non OCs so that it becomes easy to reach at a clinical diagnosis. Right identification for cysts of the jaw is needed as few cysts recognised for their biological belligerent nature along with their recurrence. So it's mandatory, to have knowledge of histology of odontogenic epithelium so as to diagnose the lesions well (Jones et al., 2006; Dar MS et al., 2016). Very few studies have been carried out on odontogenic cysts and non odontogenic cysts after the revised WHO classification in 2017 of cysts (Soluk et al., 2017). Hence we have attempted to carry out a study on odontogenic cysts and non odontogenic cysts in Odisha population to see the statistics. Very few studies in the past have described odontogenic and non odontogenic cysts and their recurrences (Parra et al., 2003; Partridge et al., 1987 & Phillipsen et al., 2004). In our study the three most frequent cysts were RC 50(47%) followed by OKC 30 (28%) then DC 19 (18%). These results were in concordance with other studies (Ochseninus et al., 2007). RC was the most common cyst and this was in accordance with the previous studies. The females were more seen with radicular cyst formation then male and the anterior maxillary area was affected more than mandible. These

observations were in accordance with the studies done by Leadsman et al., 2000; Jones et al., 2003 & Mosqueda et al., 2002). Most of the OKCs in our study were seen in the second and third decades and there was a marked male predominance which was in concordance with the previous studies too (Jones et al., 2006; Kaplan et al., 2005; Mosqueda et al., 2002; Mosqueda et al., 2002; Ledesma et al., 2000; Varinauska et al., 2006 & Meningaud et al., 2006). The third most predominant cyst was DC which showed male predominance in our study and the anatomical site most affected was that of posterior mandible which were in concordance with the studies done by Jones et al. (2006), Kaplan et al. (2005), Mosqueda et al. (2002), Ledesma et al. (2000), Varinauska et al. (2006) & Meningaud et al. (2006). The cyst was seen maximum in the third decade according to our study. Rest of the odontogenic cysts were negligible in quantity and hence are not statistically included in our study. The most predominant non odontogenic cyst found in our study was mucous extravasations cyst: 28(72%) followed by nasopalatine cyst: 5 (12.8%). The prevalence of nasopalatine cyst was supported by other studies like Dar MS et al. (2016). There was female predominance seen in mucous extravasation cyst and they were most commonly seen on lips. They were most predominant in the third decade of age. Nasopalatine cysts were the second most common cysts encountered in our study and they showed male predominance. The prevalence of odontogenic cysts (73%) was much higher in comparison to the non odontogenic cysts (27%) in the Odisha population.

5. CONCLUSION

Our study results show that the range of occurrence of OCs and non OCs is wide. Different cysts have different preference in relation to gender, age & site. The characteristics clinically of such cysts along with the demographic details can be used to obtain epidemiological information of the cysts. Very few studies have been done in Odisha population so far to record their prevalence. Hence more studies with higher number of patients are required to reach unbiased conclusions regarding their prevalence, gender predominance, site and age of occurrence so as to be able to diagnose them better.

Funding

No funds were received for this study from any organization.

Conflict of Interest

The author has no conflict of interest to be declared.

Ethical approval

The study was approved and no ethical clearance as recorded cases included.

Data and materials availability

All data associated with this study are present in the paper.

Abbreviations

RC—Radicular Cyst

OKC—Odontogenic Keratocyst

DC--- Dentigerous Cyst

RESI CYST---Residual Cyst

LAT PER CYST--- Lateral Periodontal Cyst

GOC--- Glandular Odontogenic Cyst

COC--- Calcifying Odontogenic Cyst

ABC--- Aneurysmal Bone Cyst

MUCOUS E --- Mucous Extravasations Cyst

MUCOCELE ---Mucous Retention Cyst

Peer-review

External peer-review was done through double-blind method.

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