



PREVALENCE OF ODONTOGENIC AND NON-ODONTOGENIC LESIONS OF THE JAW IN UDAIPUR - A RETROSPECTIVE STUDY

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ABSTRACT

Introduction: The jaw can be affected by a wide spectrum of lesions, ranging from inflammatory processes to malignant neoplasms. Jaw lesions can be very aggressive causing pain, paresthesia, swelling, drainage, tooth loss, root resorption, facial deformity, and other serious consequences.

Methodology: In this retrospective study of 8 years, biopsy records of all jaw lesions archived in the Department of oral and maxillofacial pathology at dental college and hospital, other institutes and private labs during the period January 2006 to December 2013 were reviewed to check the prevalence of odontogenic and non-odontogenic lesions of the jaws. The biopsies were divided into two major groups: cystic lesions (group 1), tumors and tumor-like lesions (group 2). Groups 1 and 2 were again subdivided into odontogenic and nonodontogenic.

Results- The data revealed that Periapical cyst (304/456, 82%) was the most commonly reported odontogenic cyst, followed by dentigerous cyst (46/456, 10%), residual cyst (18/456, 3.9%), among the odontogenic tumors, the most prevalent was keratocyst odontogenic tumor (101/210, 48%) followed by ameloblastoma (45/210, 21.4%), odontoma (35/210, 16.6%). Whereas most frequent found benign non-odontogenic tumor was the osteoma (64/232, 27.5%) followed by ossifying fibroma (51/232, 21.98%) and oral squamous cell carcinoma (9372/9707, 96.5%) was the most prevalent malignant tumor, followed by osteosarcoma (72/9707, 0.7%).

Conclusion- The prevalence of odontogenic cysts and tumors was similar to that reported in the literature, with inflammatory cysts, keratocyst odontogenic tumor and OSCC occurring most frequently. Case series of epidemiological profile of cysts and tumors; contribute to the understanding of the etiological and clinical aspects of these lesions.

KEYWORDS : odontogenic cyst, nonodontogenic cyst, odontogenic tumor, nonodontogenic tumor, oral squamous cell carcinoma (OSCC), periapical cyst.

Introduction

The oral cavity and maxillofacial region is often host to a wide spectrum of pathological lesions of variable nature; neoplastic, cystic, keratotic, inflammatory, reactionary and the list is exhausting. The hallmark features of the oral cavity are the teeth, gingiva, oral mucosa, tongue and the salivary glands and thus their respective pathologies like odontogenic and non odontogenic cysts/tumors, the lesions reported in various studies published worldwide.^[1]

Due to the large variety of lesions, an equally wide spectrum of clinical and histopathological presentations is encountered. Thorough knowledge of regional anatomy and normal histology for definite diagnosis is thus essential to understand the nature, incidence and pattern of these lesions.^[2]

The importance of oral and maxillofacial tumours lies in the fact that they are rare, cause disfiguring of the face necessitating subsequent reconstructive surgery. (Nzegwu and Uguru 2008). Oral pathology is a well-recognized specialty around the world with qualified oral pathologists practicing their forte, thus a good number of studies are published worldwide reporting the increasing incidence of oral lesions.^[3,4,5]

One of the main aspects of diseases is their demographic and distribution pattern, which leads to better understanding and further clinical implications. Such information regarding odontogenic and non-odontogenic cysts/tumors could be obtained from several sources such as general medical hospitals, dental colleges and hospitals and Pathology laboratories, where patients' records and slides are preserved for many years. In spite of presenting some biases, files of Oral Pathology diagnostic services are accepted as one of the most valid accessible sources of information on odontogenic lesions & non-odontogenic lesions and almost all studies on this subject are based on them. Little is known about the relative frequency and demographic features of Odontogenic and non-odontogenic lesions. While some studies have investigated the subject, paucity of information is still obvious. Such information can not only be regarded as an epidemiologic baseline for further research, but can also be utilized for diagnostic and educational purposes.^[7]

To our knowledge, there are no reports about the frequency of these lesions in Udaipur. For this reason, we present in this article the results of a collaborative retrospective study that examined the frequency and distribution, according to patient age of the odontogenic and non-odontogenic lesions recorded at dental colleges, other institutes and private laboratories in Udaipur City.

Material and methods- Cases diagnosed as odontogenic cysts and tumors between January 2006 and December 2013 were retrieved from the Department of oral and maxillofacial pathology at dental college and hospital, other institutes and private labs. The study design was retrospective descriptive.^[2] Data regarding age, histopathological evaluation and treatment done were gathered from the clinical records. Cases with incomplete demographic details of patients and non-odontogenic biopsy were excluded from the study. Classification of the diagnosis was based on the International Statistical Classification of Diseases and Related Health Problems (ICD-10) published by World Health Organization.

The biopsies were divided into two major groups:

Group 1-cystic lesions

Group 2-tumors and tumor-like lesions

Group 1 and group 2 again subdivided into odontogenic and non-odontogenic lesions.

Mean values of different parameters- were subjected to descriptive statistical analysis with spss version 17.0 statistical software package.

RESULTS

Data from 2006-2013, revealed 10,373 intra-osseous lesions from the jaws, comprising 666 odontogenic and 9707 non-odontogenic lesions (table 1). Out of 666 odontogenic lesions 456 were cysts and 210 odontogenic tumors, making cysts 2.17 times more common than tumors.^[10] (Table 2 & 3) among the non-odontogenic lesions malignant tumors were more frequent.

Private laboratories archived 110/456 of odontogenic cysts and 42/210 odontogenic tumors compared to institutes and hospitals. (Table 2)

The overall mean age of patients diagnosed with odontogenic cyst was found to be significantly higher than the odontogenic tumor (35.74 year >31.23 year).

The mean age for the various cysts was between the third and fifth decades. In contrast, the majority of the odontogenic tumors were in the fourth decade. (Table 2&3)

The most common odontogenic cyst diagnosed was Periapical cyst (374/456 82%) followed by dentigerous cyst (46/456, 10%), residual cyst (18/456, 3.9%) were located in the posterior mandible. (Table 2) On the other hand the most prevalent odontogenic tumor diagnosed was keratocyst odontogenic tumor (101/210, 43.8%) followed by ameloblastoma (45/210 21.4%), odontoma (35/210, 16.6%) located exclusively in the posterior mandible. (Table 3)

Among the benign non-odontogenic lesions the most prevalent was osteoma 64/232, 27.5%, followed by ossifying fibroma 51/232, 21.9% were encountered in the posterior mandible with the mean age being 38.60 year. (Table 4)

With regard to non- odontogenic malignant tumors private labs archived 589 with hospital and institutes archiving 9118 cases.(table 5) highest frequency of lesion was oral squamous cell carcinoma in the mandibular alveolus region (9372/9707, 96.5%) with regard to grading most of the cases were with histopathological grades of well differentiated squamous cell carcinoma (60%), followed by moderately differentiated squamous cell carcinoma(35%), very few cases has been carried out of poorly differentiated squamous cell carcinoma(5%), next most frequent lesion found was osteosarcoma (72/9707, 0.7%).(Table 5)

Under the treatment modalities for all the odontogenic cysts and non-odontogenic cystic lesions surgical enucleation was accomplished. Surgical excision was carried out for odontogenic and non-odontogenic tumors with further follow up for ossifying fibroma, central giant cell granuloma, Anurysmal bone cyst and desmoplastic fibroma. For all the non odontogenic malignant tumors surgical excision was carried out, follow up and referral to cancer research center was recommended.

DISCUSSION

The present study provides new epidemiological data for odontogenic and non-odontogenic lesions in the Udaipur population. While collecting the data, complete parameters were not available for every specimen. This highlights the need for clinicians to be thorough when completing histopathology forms, supplying the histopathologist with all required clinical and radiological information so that an overall impression can be inferred.⁽¹¹⁾The place of Udaipur was chosen for this study due to the geographic representation of its population.

On literature review we observed very few studies being carried out including both odontogenic and non-odontogenic lesions. In the present study total 10373 odontogenic and non-odontogenic lesions observed which contains 666 odontogenic lesions and 9707 non-odontogenic lesions.(Table 1)

Oral squamous cell carcinoma was the most prevalent non-odontogenic malignant tumors followed by osteosarcoma, which was similar to results of studies by Taylor et al. (Mexico 1997), Basher A. et al. (Iraq 2010), Nadia Zaiba et al (Rawalpindi 2012), Marina mendez et al. (Brazil 2012) study. However different from the study by Nigel R. Johnson (Queensland 2013) in which most frequent found non-odontogenic malignant tumor was chondroblastic osteosarcoma followed by follicular lymphoma.

Next major category of lesion in the present study was odontogenic cyst. Current study showed predominance of Periapical cyst followed by dentigerous cyst. Which was similar to the results of studies by Basher A et al in (Iraq 2010), Mohammad j. et al.(Iranian 2011), Marina mendez et al. (Brazil 2012), Manickam Selvami et al.

(Karnataka 2012), Saima Akram et al.(Karachi 2013), Aydan Acikgoz (Turkish 2012), Prashanth Ramachandra et al. ((2011 banglore). Nigel R Jhonson et al. (Queensland 2013), Alexander et al. (Ghana 2012), Natheer Hashimet et al. (UAE 2013) studies. Present study also revealed higher frequency of periapical cysts in respect to above studies.

Odontogenic tumors rarely present clinically in daily dental practice and therefore, it takes considerable time and effort for any center to collect cases of odontogenic tumors in wide number. KCOT was the most prevalent odontogenic tumor in our sample, followed by ameloblastoma, this finding is similar to results of other studies conducted by Saima Akram et al.(Karachi 2012), Nigel R Jhonson et al.(Queensland 2013), however different from Ladeinde Al. et al.(Nigeria 2005), Simon et al.(Tanzania 2005), Sriram G. Shetty (Indian 2008), Nasrollah et al.(Iranian 2010), Sharanjeet Gill et al.(Gujarat 2011), Figenseses et al.(Turkey 2012), Natheer Hashimet et al.(UAE 2013), who reported ameloblastoma and odontoma as most frequent type of odontogenic tumors. We found KCOT as most frequent odontogenic tumor it could be because of WHO has recently redesignated odontogenic keratocyst as KCOT due to the aggressive behavior, histology and genetics.

While comparing the results for non odontogenic tumors obtained with those published by other authors, a number of differences were noted. In our series the most commonly diagnosed non-odontogenic tumor was osteoma followed by ossifying fibroma. Which was different from studies by Marina Mendez et al. (Brazil 2012), Fawzia M.et al. (Kenya 2012), Aydan Acikgoz (Turkish 2012) and Nigel R. Jhonson et al. (Queensland 2013).

CONCLUSION-

This retrospective study provides prevalence of odontogenic and non-odontogenic lesions in the Udaipur population. The lesions affecting the oro facial region constitute a diverse group of pathologies. Of all the oral biopsies reported at the pacific dental college and other institutes and private laboratories, in the concerned period, Oral squamous Cell Carcinoma was the most commonly reported pathology making it an emerging threat to the community and highlighting the need to take effective measures to increase public awareness about the risk factors and consequences of this life-threatening condition.⁽¹⁸⁾

Measures should be designed to encourage the population to have routine oral examination making an early detection of any pathological changes occurring which will contribute in alleviating dental and oral health of the population.^(19,20)

Table 1 Showing total numbers of odontogenic and non-odontogenic tumors

Odontogenic lesions	666
Non odontogenic lesions	9707
total	10373

Table -2 Showing frequency of odontogenic cysts

Pathology	Institute& hospital	Private lab	Mean age	Total	Frequency (%)	p value
Periapical cyst	304	70	39.4	374	82%	0.002
Dentigerous cyst	30	16	28.7	46	10%	
Residual cyst	5	13	38.6	18	3.9%	
Lateral periodontal cyst	-	9	27.2	9	1.9%	
Glandular odontogenic cyst	7	2	38.2	9	1.9%	
Total	346	110	35.74	456	100%	

p-0.002 Obtained indicate that private institute and hospital

achieved more odontogenic cysts as compared to private laboratories.

Table-3 Showing frequency of odontogenic tumors

Pathology	Institute & hospital	Private lab	Mean age	Total	Frequency (%)	p value
Keratocystic odontogenic tumor	86	15	32.7	101	43.8%	0.001
Ameloblastoma	34	11	33.2	45	21.4%	
Odontoma	32	3	28.7	35	16.6%	
Calcifying cystic odontogenic tumor	4	5	30.7	9	4.2%	
Adenomatoid odontogenic tumor	5	7	31.0	12	5.7%	
Ameloblastic fibroma	1	-	10.0	1	0.4%	
Odontogenic myxoma	3	1	14.3	4	1.9%	
Odontogenic fibroma	3		32.0	3	1.4%	
Total	168	42	31.23	210	100%	

p-0.001 Obtained indicate that private institute and hospital achieved more odontogenic tumors as compared to private laboratories

Table -4 Showing frequency of non odontogenic cyst, tumors and tumor like lesions

Pathology	Institute& hospital	Private lab	Mean age	Total	Frequency (%)	p value
Osteoma	60	4	40.23	64	27.5%	0.002
Ossifying fibroma	42	9	31.8	51	21.9%	
Fibrous hyperplasia	30	10	40.7	40	17.2%	
Central giant cell granuloma	15	17	23.8	32	13.7%	
Fibrous dysplasia	17	14	23.7	31	13.3%	
Nasopalatine cyst	5	4	38.5	9	3.8%	
Aneurysmal bone cyst	2	1	16.5	3	1.2%	
Desmoplastic fibroma	2		29.6	2	0.8%	
Total	173	59	38.60	232	100%	

p-0.002 Obtained indicate that private institute and hospital achieved more non-odontogenic cyst, tumor and tumor like lesions as compared to private laboratories

Table -5 showing frequency of non-odontogenic malignant tumors

Pathology	Institute& hospital	Private lab	Mean age	Total	Frequency (%)	p value
Oral squamous cell carcinoma	8856	516	53	9372	96.5%	0.003
Osteosarcoma	67	5	37.7	72	0.7%	
Multiple myeloma	16	3	52.1	19	0.1%	
Chondrosarcoma	1	3	65	4	0.04%	
Spindle cell sarcoma	1	3	51.6	4	0.04%	
Malignant histiocytoma	4		51.6	4	0.04%	
Total lesion	9118	589	40.1	9707	100%	

p-0.003 Obtained indicate that private institute and hospital achieved more non-odontogenic malignant tumors as compared to private laboratories.

REFERENCES

- Bataineh AB, Rawashdeh MA, Al Qudah MA. The prevalence of inflammatory and developmental odontogenic cysts in a Jordanian population: a clinicopathologic study. Quintessence Int 2004;35:815-819.
- Adalberto Mosqueda-Taylor, Constantino Ledesma, Montes b Silvia. Odontogenic tumors in Mexico A collaborative retrospective study of 349 cases, Oral Surg Oral Med Oral Pathol Oral Radial Endod 1997;84:672-5.
- Akinola Ladipo, Ladeinde, Oluseyi, Folake Ajayi, Mobolanle Olugbemiga, Ogunlewe, Wasuu, Lanre Adeyemo et al. Odontogenic tumors-a review of 319 cases in a Nigerian teaching hospital. Oral surgery, oral medicine, oral pathology, oral radiology and endodontology, 2005;99:(2).
- Alexander Acheampong Oti, Peter Donkor, Osei Owusu-Afriyie. Orofacial Cysts at Komfo Anokye Teaching Hospital, Ghana, Surgical Science, 2013;4:65-67.
- Daley TD, Wysocki GP, Pringle GA. Relative incidence of odontogenic tumors and oral and jaw cysts in a Canadian population. Oral Surg Oral Med Oral Pathol 1994; 77, 276-280
- Fawzia M. Afrid Butt, Julius Ogengo, Jyoti Bahra, Mark L. Chindia. The pattern of benign jaw tumors in a university teaching hospital in Kenya: (a 19-year audit) 2012
- Grossmann SM, Machado VC, Xavier GM, Moura MD, Gomez RS, Aguiar MC. Demographic profile of odontogenic and selected nonodontogenic cysts in a Brazilian population. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007; 104, e35-41.
- Gupta B and Ponniah I. The pattern of odontogenic tumors in a government teaching hospital in the southern Indian state of Tamil Nadu. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010; 110:e32-e39.
- Jones AV, Craig GT, Franklin CD. Range and demographics of odontogenic cysts diagnosed in a UK population over a 30-year period. J Oral Pathol Med 2006; 35, 500-507.
- Borges, Leandro Bezerra, Fechine Francisco, Vagnaldo Mota, Mário Rogério, Lima, Sousa et al. Odontogenic lesions of the jaw: a clinical-pathological study of 461 cases, GO-Rev Gaúcha Odontol 2012;60(1): 71-78.
- Ledesma-Montes C, Hernandez-Guerrero JC, Garces-Ortiz M. Clinic-pathologic study of odontogenic cysts in a Mexican sample population. Arch Med Res 2000; 31, 373-376.
- Mohammad J. Sharifian, Maryam Khalili. Odontogenic cysts: a retrospective study of 1227 cases in an Iranian population from 1987 to 2007, Journal of Oral Science, 2011; 53(3):361-367.
- Ali MA. Biopsied Jaw Lesions in Kuwait: A Six-Year Retrospective Analysis, Med Princ Pract 2011;20:550-555
- Nadia Zaib, Madiha Sajjad, Samina, Latif, Sabeen Abbas, Salma Shaheen. Oral biopsies: study of 114 cases. Pakistan Oral & Dental Journal 2012; 32(3).
- Natheer Hashim, Al-Rawi, Manal Awad, Imad Eddin, Al-Zuebi, Racha A. Prevalence of odontogenic cysts and tumors among UAE population, Journal of Orofacial Sciences 2013; 5 (2).
- Negin Khosrav, Sayed Mohammad Razavi, Mahsa Kowkabi, Amir Arsalan Navabi. Demographic distribution of odontogenic cysts in Isfahan (Iran) over a 23-year period (1988-2010), Dental Research Journal 2013; 10(2).
- Johnson NR, Savage NW, Kazoullis S, Batstone MD. A prospective epidemiological study for odontogenic and non-odontogenic lesions of the maxilla and mandible in Queensland., Oral Surg Oral Med Oral Pathol Oral Radiol 2013; 115:515-522.
- Nzegwu MA, Uguru C, Okafor OC, Ifoema O, Olusina D. Pattern of oral and jaw tumours seen in eastern Nigeria: a review of sixty cases seen over a 5-year period-January 2000 to 31 December 2004. European Journal of Cancer Care; 17:532-534.
- Ramachandra P, Maligi P, Raghuvver H. A cumulative analysis of odontogenic cysts from major dental institutions of Bangalore city: A study of 252 cases, Journal of Oral and Maxillofacial Pathology 2011; 15 (1).
- Saima Akram, Naghma, Mian Anwar Ali, Mirza M. Shakir. Prevalence of Odontogenic Cysts and Tumors in Karachi, Pakistan Journal of the Dow University of Health Sciences Karachi 2013; 7 (1): 20-24.
- Sharanjeet Gill, Jyoti Chawda, Dhaval Jani. Odontogenic tumors in Western India (Gujarat): Analysis of 209 cases, J Clin Exp Dent. 2011; 3(2):e78-83.
- Shear M, Speight P (2007) Cysts of the oral and maxillofacial regions. 4th edition
- Shujari azansari Atta, Ur Rehman, Basheer Rehman. Frequency and demography of commonly occurring odontogenic cysts in khyberpakhtunkhwa (pakistan, pakistan oral & dental journal 2010; 30(1).
- Simon EN, Merck MA, Vuhahula E, Ngassapa D, Stoelinga PJ. A 4-year prospective study on epidemiology and clinicopathological presentation of odontogenic tumors in Tanzania. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005; 99:598-602.
- Tortorici S, Amodio E, Massenti MF, Buzzanca ML, Burruano F, Vitale F. Prevalence and distribution of odontogenic cysts in Sicily: 1986-2005. J Oral Sci 2008; 50, 15-18.