INCIDENCE AND PREVALENCE OF BENIGN ODONTOGENIC TUMOURS AMONG PATIENTS VISITING TIKURANBESSA SPECIALIZED HOSPITAL AND IT'SAFFLIATED HOSPITALS {AAU DENTAL CENTER AND ST.PETER SPECIALIZED HOSPITAL} FROM JANUARY2020, DECEMBER2021, AA, ETHIOPIA

BY: - BERHANU REGASSA (MAXILLOFACIAL SURGERY RESIDENT)

A RESEARCH PAPER TO BE SUBMITTED TO DEPARTMENT OF ORAL AND MAXILLOFACIALSURGERY, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY; IN PARTIAL FULLFILMENT FOR THE REQUIREMENT FOR THE SPECIALTY CERTIFICATE IN ORAL AND MAXILLOFACIAL SURGERY

MARCH, 2022

ADDIS ABABA, ETHIOPIA

Addis Ababa University

College Of Health Sciences

Department of Oral and Maxillofacial surgery

INCIDENCE AND PREVALENCE OF BENIGNODONTOGENIC TUMOURS AMONG PATIENTS VISITINGTIKUR ANBESSA SPECIALIZED HOSPITALAND IT'SAFFLIATED HOSPITALS {AAU DENTAL CENTER AND ST.PETER SPECIALIZED HOSPITAL} FROM JANUARY2020, DECEMBER2021, AA, ETHIOPIA

By: -BERHANU REGASSA (Oral and Maxillofacial Surgery Resident)

Email:berhanu480@gmail.com

Phone: +251917794226

Advisor: Dr. Demerew Dejene (Assistant Professor of Oral and Maxillofacial Surgery)

Email: Demewelela@gmail.com

Phone: +251912224087

Co-Advisor: Dr. Girma Uma (Assistant Professor of Oral and Maxillofacial Surgery)

Email: omfsgirma17@gmail.com

Phone: +251911405690

MARCH, 2022

Addis Ababa, Ethiopia

Abstract

Background: Pathological processes of oral and maxillofacial region are generally classified as benign or malignant based on specific histological criteria, including the presence or absence of necrosis, mitotic figures as well as basic understanding of the entity.

Odontogenic tumor (OT) comprises a large heterogeneous group of lesions arising from the tooth producing tissues or its remnants. It ranges from hamartomatous or non-neoplastic proliferations to benign and malignant neoplasm with variable aggressiveness and metastatic potential.
OTs cause facial disfiguring that necessitates subsequent reconstructive surgery.
The objective of this study was to determine the types, prevalence and demographic distribution of benign Odontogenic tumor among patients treated at tikuranbessa specialized hospital and its affiliated hospitals.

Objective: To assess the incidence and prevalence of benign Odontogenic tumor among patients treated at tikuranbessa specialized hospital and its affiliated Hospitals in Addis Ababa, Ethiopia over a retrospective period of 2 years from January 2020 to December2021.

Methods: Retrospective review of patients records will be conducted among those patients who visited tikuranbessa specialized hospital and its affiliated hospitals diagnosed with benign Odontogenic tumors' in the time period of January 2020 to December 2021 G.C. Data such as age, gender, duration of lesion, location of the tumors, size of the tumors, type of tumors, type of surgical treatment, and complaints during follow-up were reviewed. All the collected data were then coded, checked, edited and entered to SPSS windows 25. Finally, the data was analyzed by descriptive statistics.

Results::A total of 68 patient's socio-demographic, and clinical data were reviewed from the registry book of patients who were diagnosed with OT. The complete data set was obtained for 55 patients, comprising 28(50.9 %) males and 27 (49.1 %) females. The mean age of patients was 30.4, with a range of (6–68) years. Concerning the location of OTs, 20 (36.4 %) occurred in the maxilla, and the vast majority 35(63.6%) in the mandible. Ameloblastoma with predilection for the mandible was the most frequent OT (32.7%), followed by keratocystic Odontogenic tumours (KCOT) (24.45 %).

Conclusions: OTs were found in both genders with similar proportion.

Checkup and/or visit to dentists could help early case detection, and management of OT.

Key words: Odontogenic tumor, Incidence, Retrospective.

Acknowledgement

First and foremost, I would like to praise the Almighty God for his mercy and help in the way of my entire academic journey. Next, I would like to express my heartfelt gratitude to my advisor **Dr. Demerew Dejene and co-** advisor **Dr.Girma Uma** who guided me in doing this thesis reality .Last but not least, I would also like to extend my thanks to AAU, CHS for giving me this valuable opportunity.

Acronyms

AAU- Addis Ababa University

CHS – College of Health sciences

OT– Odontogenic Tumor

KCOT- Keratocystic Odontogenic Tumor

COF- Central Odontogenic Fibroma

CEOD- Calcified Epithelial Odontogenic Tumor

AOT-Adenomatoid Odontogenic Tumor

OMF - Oral and maxillofacial

SPSS- Statistical package for social sciences

WHO - World Health Organization

Yrs- Years

TASH-Tikur Anbessa Specialized Hospital

Tables of contents

Abstract I

Acknowledgement II

Acronyms III

Tables of contents IV

CHAPTER ONE 1

1. Introduction 1

1.1 Background Information 1

1.2 Statement of the problem 3

CHAPTER-2 5

2.1. Literature Review 5

Significance of the study 7

Chapter-3 8

3. Objectives 8

3.1 General Objective 8

3.2 Specific objectives 8

Chapter-4 9

4. Methods and Materials 9

4.1 Study area and period 9

4.2 Study design 9

4.2.1 Source population 9

4.2.2 Study population 9

4.3 Sample size and sampling technique 10

4.3.1 Sample size Determination 10

4.3.2 Sampling technique 10

4.3.3 Inclusion criteria 10
4.3.4 Exclusion criteria 10
4.4 Variables........ 10
4.4.1 4.5.1 Independent variables 10
4.4.2 Dependent Variables 11
4.5 Data collection procedures 11
4.5.1 Disease Identification........ 11
4.5.2 Disease Classification and Categorization 11
4.6 Operational definitions and Terms 11
4.7 Data quality assurance 12
4.7.1 Pre-test 12
4.7.2 Data collectors training and supervision 12
4.8 Data analysis 12
4.9 Ethical Consideration 13
4.9 Dissemination plan 13
Chapter-5........ 14
RESULTS 14
CHAPTER-6 21
DISCUSSIONS 21
Strengths and limitations........ 23
CHAPTER-7 24
CONCLUSIONS AND RECOMMENDATIONS 24
Annex I: References........ 25
DATA CALLECTION FORMAT 28

List of tables

Table 1:-Age and gender distribution of study population at AAU (TASH), CHS affiliated hospitals.

Table 2:-Frequency of benign Odontogenic tumor according to the recent WHO classification, TASH, Addis Ababa, Ethiopia, 2021

Table 3:-Distribution of Benign Odontogenic tumors by sex in line with the recent WHO classification, TASH and its affiliated hospitals, Addis Ababa, Ethiopia, 2021

Table 4:-Distribution of benign Odontogenic tumors by age, according to the recent WHO classification of benign Tumors, TASH and its affiliated hospitals, Addis Ababa, Ethiopia, 2021

Table 5:-Distribution of benign Odontogenic tumors by place of occurrence according to the recent WHO classification, TASH and its affiliated hospitals, 2021

Figure 1:-Frequency of OT cases diagnosed in Year 2020 &2021

Figure 2:- Frequency of OTS diagnosed by the year after onset of symptoms

Figure 3:-Frequency distribution of surgical treatment of benign Odontogenic tumors at TASH and its affiliated hospital, Addis Ababa, Ethiopia, 2021

Figure 4 :- Frequency distribution of complications of benign Odontogenic tumors at TASH and its affiliated hospital, Addis Ababa, Ethiopia, 2021

CHAPTER ONE

1. Introduction

1.1 Background Information

Oral health is fundamental to general health and essential for wellbeing. It implies that the absence of oral tumor, throat cancer, mouth and facial pain, oral infection and sores, periodontal disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing (1). Among others, oral tumors (neoplastic conditions) impose substantial impact on the lifestyle of human beings.

The jawbones are one of the most suitable sites of neoplastic conditions. These neoplasms can be either benign or malignant. In addition, they can also be Odontogenic or non-Odontogenic.

Non odontogenic tumours as the name suggests are tumours that arise from tissues other than the tooth or tooth-forming tissues. They can occur in the jaw, with or without the involvement of other bones of the skeleton. These tumours can be the oral manifestations of a generalised disorder like polyostotic fibrous dysplasia, Paget's disease, Brown tumour.

Non odontogenic tumours of the jaws comprise of tumours which are solely made up of bone or cartilage and fibrosseous lesions which may contain bone, fibrous tissue, osteoid, cartilage and cementum. Osseous tumours are slow growing, cause bony expansion and facial disfigurement

Odontogenic tumors (OTs) are rare and specifically formed in the jaw bones. OTs constitutes a heterogeneous group of lesions due to the different degrees of intertissue interaction and various growth patterns. Furthermore, they show variable clinical and histopathological features. Among other, the ability of OTs to transit from one form to another complicates the formal classification of OTs. As a result, the World Health Organization (WHO) is obligated to revise the classification of OTs for the second time to have a consensus all over the world (2, 3). Nevertheless, this does not resolve the controversial issues of classifying OTs consistently throughout the world. In 2005, the WHO published the latest updated edition 3 of Odontogenic tumors histological typing that brought some substantial changes (4-7). (Figure- 1)

OTs include entities of a hamartomatous nature, such as odontoma,a benign neoplasm, some of which are aggressive as in the case of ameloblastoma and myxoma, and malign neoplasms capable of metastasis (8). Ameloblastoma is the most quoted odontogenic tumor in several case series in the literature, equating to approximately 10% to 30%. It is the most common among

individuals of the second and fifth decades of life. However, there is some disagreement amongst authors as to the gender most affected. With respect to the choice of jaws, a greater preference for the lower jaw has been reported (9).

In addition to the aforementioned once, other tumors of odontogenic origin are worthy to mention, such as the keratocystic odontogenic tumor, odontoma, odontogenic myxoma, ameloblastic fibroma, odontogenic fibroma. The keratocystic odontogenic tumor (KCOT) occurs predominantly as an asymptomatic lesion between the second and fourth decades of life in the posterior mandibular region. KCOT cause extensive areas of bone reabsorption prior to being diagnosed and around 10 % occur in edentulous patient. KCOTs have a high recurrence rate, reportedly between 25 % and 60 % (10, 11).

MALIGNANT TUMOURS	
Odontogenic carcinomas	
Metastasizing (malignant) ameloblastoma[1]	9310/3
Ameloblastic carcinoma – primary type	9270/3
Ameloblastic carcinoma – secondary type (dedifferentiated), intraosseous	9270/3
Ameloblastic carcinoma – secondary type (dedifferentiated), peripheral	9270/3
Primary intraosseous squamous cell carcinoma – solid type	9270/3
Primary intraosseous squamous cell carcinoma derived from keratocystic odontogenic tumour	9270/3
Primary intraosseous squamous cell carcinoma derived from odontogenic cysts	9270/3
Clear cell odontogenic carcinoma	9341/3
Ghost cell odontogenic carcinoma	9302/3
Odontogenic sarcomas	
Ameloblastic fibrosarcoma	9330/3
Ameloblastic fibrodentino–and fibro-odontosarcoma	9290/3
BENIGN TUMOURS	
Odontogenic epithelium with mature, fibrous stroma without odontogenic ectomesenchyme	
Ameloblastoma, solid / multicystic type	9310/0
Ameloblastoma, extraosseous / peripheral type	9310/0
Ameloblastoma, desmoplastic type	9310/0
Ameloblastoma, unicystic type	9310/0
Squamous odontogenic tumour	9312/0
Calcifying epithelial odontogenic tumour	9340/0
Adenomatoid odontogenic tumour	9300/0
Keratocystic odontogenic tumour	9270/0
Odontogenic epithelium with odontogenic ectomesenchyme, with or without hard tissue formation	
Ameloblastic fibroma	9330/0
Ameloblastic fibrodentinoma	9271/0
Ameloblastic fibro-odontoma	9290/0
Odontoma	9280/0
Odontoma, complex type	9282/0
Odontoma, compound type	9281/0
Odontoameloblastoma	9311/0
Calcifying cystic odontogenic tumour	9301/0
Dentinogenic ghost cell tumour	9302/0
Mesenchyme and/or odontogenic ectomesenchyme with or without odontogenic epithelium	
Odontogenic fibroma	9321/0
Odontogenic myxoma / myxofibroma	9320/0
Cementoblastoma	9273/0
Bone-related lesions	
Ossifying fibroma	9262/0
Fibrous dysplasia	
Osseous dysplasias	
Central giant cell lesion (granuloma)	
Cherubism	
Aneurysmal bone cyst	
Simple bone cyst	
OTHER TUMOURS	
Melanotic neuroectodermal tumour of infancy	9363/0
see Chapter 1, pp. 70-73	

Figure-1.Histological classification of OTs.Taken from WHO Histological Typing of OTs (6)

Odontogenic myxoma is an intraosseous neoplasm consisting of myxomatous fibrous extracellular matrix originating from mesenchymal remnants. Adenomatoid odontogenic tumors arise from the dental lamina in the gubernacular cord of developing permanent teeth. Ameloblastic fibromas are similar in origin to ameloblastomas, being derived from the enamel organ or dental lamina, except there is a lack of dental hard tissue in them specimen (12).

Central Odontogenic Fibroma (COF) originates from ectomesenchymal odontogenic tissues such as dental follicle and the periodontal ligament. COF constitute approximately 1.5% of odontogenic tumor. The tumor is more common in females than males. Furthermore, COFs are dictated during the two decade of life. Generally, COF resembles as a painless swelling with a slow growth (13).According to the research done in Tanzania Ameloblastoma was the most common benign lesion (27.4%) followed by ossifying fibroma (18.7%), pyogenic granuloma (11.4%), pleomorphic adenoma (10.0%), and fibrous dysplasia (9.6%). Females were more affected than males, with a male to female ratio of 1:1.4

1.2 Statement of the problem

OTs arederived from epithelial, ectomesenchymal and/or mesenchymal elements of the odontogenic tissues. The skull, jaws and facial bones are not only the site of a number of usual lesions but also pose unique histological problems often associated with intra-oral variation in oral structure ranging from potentially malignant to pseudo-malignant features (14, 15). Even though tumors of Oral and Maxillofacial are rare, they cause facial disfiguring which necessitating subsequent reconstructive surgery. OTs are heterogeneous group of tumors that pose a significant diagnostic and therapeutic challenge (5, 14-17).Of the total tumors reported, about 5% are tumors and tumor like lesions of the orofacial lesion. Many retrospective studies have been conducted in different continents of the world such as: in Africa, Asia, Europe, and North and South America to assess the distribution of OTs. The prevalence rates of OTs ranging from 1 % to 28 % have been reported from different parts of the world. The overall and relative frequency of individual OTs differs from region to region. It is speculated that the difference in the frequencies observed are attributed to variations in geographic or cultural effects (18).Nonetheless, unanswered question still remain about the relative frequency and the incidences of certain odontogenic tumors. However, the overall incidence of OTs is reported to be higher among Africans, and hence a distinct racial predilection is suggested in the incidence rates of these orofacial lesions. The majority of OTs seems to arise*de novo*, without an apparent causative factor. Thus, the cause(s) of OTs remains unclear (16, 19, 20).

Depending on the type of benign Odontogenic tumor, there are different intervention methods for the treatment of benign tumors. Again within the same group of tumors, interventions also differ according to the extent of lesion, and stage of the tumor. Generally, the intervention of benign

Odontogenic tumor could involve either radical or conservative excision. In the radical surgical excision, the bone is resected with a 1 to 2 centimeters safety margin of macroscopically healthy bone. Thus, radical surgery includes marginal and segmental resections. On the other hand, conservative excision involves the removal of tumor without safety margin. In addition to surgical excision and recountouring, conservative management involves enucleation and curettage, in which it is sometimes followed by cryotherapy. As such, the overall intervention for benign Odontogenic tumors requires reconstructive surgery (21, 22). Nevertheless, the intervention methods are not effective all the time. Thus, leading to further complications such as facial deformity, malocclusion and impaired mastication were predominant seen after surgical treatment of benignOdontogenic tumors (23). Knowledge of prevalence of various types of benign Odontogenic tumors and their clinical characteristics could be extremely valuable both for pathologists and dentists when mounting a differential diagnosis, and may indicate the causes of these lesions (16). Despite this fact, there is no any information available on the prevalence of benign Odontogenic tumors in Ethiopian. Thus, the aim of this study is to assess the pattern and trend of various types of benign Odontogenic tumors at the Department of Oral and Maxillofacial surgery, St. Peter and tikuranbessa specialized hospital, Addis Ababa, Ethiopia over the past 2 years.

CHAPTER-2

2.1. Literature Review

The mouth and the maxillofacial complex are made of structures that are the target of a wide variety of odontogenic and non odontogeniclesions varying in location, etiology and histogenesis, attacking soft tissue and bone, as well as presenting variable clinical manifestations. Amongst the neoplasms of the oral cavity, odontogenic tumors constitute a heterogeneous group of lesions with histopathological characteristics and diverse clinical manifestations (8).

Patterns of benign Odontogenic tumors

The patterns of benignOdontogenic tumor in different parts of the word are different. For instance, according to the study conducted in Pakistan, 1.7 % of the cases were diagnosed malignant, and all the rest, 98.3 %, were benign (24). In addition, a retrospective study that was conducted in Diyarbakyr, Turkey of the study groups, 23.3% were odontogenic tumors (8). In another retrospective study conducted in Argentina, among 153 cases 7 % of the study groups were diagnosed with odontogenic tumor (9). In a similar study, a total of 4,319 lesions were obtained at the Biopsy Service of the Department of Pathology and Forensic Medicine at the Federal University of Ceará, Brazil. Of these, 131 were diagnosed as OTs (10). Similarly, a study conducted at federal University of Rio Grande do Norte, Brazil, among 5,289 oral biopsies registered during the 30-year period, 127 cases of benign odontogenic tumors were identified (20).

Preferred location of benign Odontogenic tumors

A definitive geographic variation has been observed in the location of Odontogenic tumors of the jaws reported from different parts of the world

The location of the tumor is related to individualethnicity, with posterior region of mandible most frequently involvedinCaucasian ad Japanese; while in black, especially those of African origin the anterior region ismost commonlocation[30, 31].

Based on the study conducted in Diyarbakýr, Turkey (8), Buenos Aires, Argentina (9), Kenya (17), Ceará, Brazil (19), Rio Grande do Norte, Brazil (20), Pakistan (24), Mumbai, India (25),

Nigeria (23,26), and Tanzania (27), posterior region of the mandible is the common site for these tumors (8, 9, 17, 19, 20, 23, 24, 25, 26, 27).

Type's of benign Odontogenic tumor

According to the study conducted in Pakistan, Ameloblastoma was the most common type followed by KCOT, Adenomatoid odontogenic tumors (AOT), Odontoma, Odontogenic myxoma, Odontogenic Fibroma and ameloblasticfibroodontoma respectively (24). In anothestudy conducted in Turkey Odontoma was the most common type followed by fibroma which was ameloblastic, Cementifying and odontogenic, and ameloblastoma was the list one (8). Similarly, study was conducted among 127 cases in Argentina (9). The most frequentbenign tumor were odontoma; followed by ameloblastoma, myxoma. AOT calcified epithelial odontogenic tumor (CEOT). In addition, a study conducted in Brazil among 5,289 oral biopsies registered during the 30-year period, the most frequent lesions were odontoma, followed by ameloblastoma, adenomatoid odontogenic tumor, and odontogenic myxoma (20).

A total of 60 cases where seen and diagnosed at the Department of Oral Pathology and Microbiology of Government Dental College and Hospital, Mumbai, India from January 2001 to March 2010. Interesting, all these tumors were benign. Ameloblastoma was the most common benign tumor followed by odontoma, adenomatoidOdontogenic tumor respectively (25). According to studies conducted in Kenya (17), Nigeria (24, 26) and Tanzania (27), odontogenic tumors were the most common types of tumors that occurred in the jaw. Of these, ameloblastoma was the most common one followed by Keratocystic Odontogenic tumor, Adenomatoid odontogenic tumor, odontogenic myxoma and odontoma respectively.

Socio-demographic characteristics of benign Odontogenic tumor

According to different studies conducted in Pakistan (24), Diyarbakýr Turkey (8), Argentina (9), Ceará Brazil (19), Rio Grande do Norte Brazil (20), the peak age of incidence was the second and third decades of life. On the other hand studies reported from India (25), Tanzania (27), Kenya (17) and Nigeria (23,26) benign tumor were most frequent from the second to fifth decades of life. Studies conducted in Ceará, Brazil (19), Rio Grande do Norte, Brazil (20), Mumbai, India (25) reported that odontogenic tumors are more common among females than

their counter males' partners. In contrary, males were more affected than females according to studies conducted in Pakistan (24) and Nigeria (16, 26). Intriguingly, researchers reported in Diyarbakýr, Turkey (8), Buenos Aires, Argentina (9), Tanzania (27), Kenya (17) and Nigeria (23), there was no significant difference in the gender distribution.

Significance of the study

The orofacial regions including the oral cavity, the maxilla and mandible and related tissues are the most common sites of a multitude of neoplastic conditions. These tumors have a predilection for the entire facial region. However, OTs tends to affect more often the mandible than the maxilla. The treatment of choice for OT is surgical operation; extirpation and curettage for benign and segmental resection for malignant tumors. If left untreated, it could result in death within 4 to 6 months. Despite these consequences, little is known about the magnitude of OT in Ethiopia. This highlights the urgent need for assessing the frequency of these tumors in Ethiopia which will in turn improve patient survival and quality of life ([28). Therefore, this study determined the Incidence and prevalence of OT in Ethiopia which will in turn alarm the ministry of health to act on interventional strategies, and endow information for proper management of the patients. In addition this study will increase awareness in the community, and promote effective planning and policy in relation to Benign OT. Furthermore, it will provide baseline data for further studies.

Chapter-3

3. Objectives

3.1 General Objective

- To assess the incidence and prevalence of benign Odontogenic tumors of orofacial region in TASH and its affiliated hospitals in Addis Ababa, Ethiopia over a retrospective period of 2 years from September 2020 to December2021.

3.2 Specific objectives

□□To describe the pattern of benign Odontogenic tumors

□□To assess the trend of benign Odontogenic tumors

□□To determine the preferred location of benign Odontogenic tumors

□□To assess associations between socio-demographic characteristics and type of tumor

□□To assess factors associated with time of benign Odontogenic tumor presentation

Chapter-4

4. Methods and Materials

4.1 Study area and period

The study was carried out among those patients with benign Odontogenic tumors visiting Addis Ababa University tikuranbessa specialized hospital and affiliated hospitals(St. Peter Hospital and AAU Dental Center) during the study period. AAU is one of the renowned higher learning institutions in Ethiopia and it is located in the capital city of the country, Addis Ababa. It provides health care service with 600 full time faculty staff members and 700 beds serving almost all the entire population as the only tertiary level health care center. It contains of many departments such as Dentistry, Gynecology, Internal medicine, Surgery, Ophthalmology, Pediatrics, Pharmacy, Pathology and laboratory and others public health departments. It is the only tertiary level teaching center in the country until recently. The College currently offers eight undergraduate and over 70 postgraduate programs. The Tikuranbessa Specialized Hospital (TASH) is the teaching hospital of the College. TASH is the largest specialized hospital in Ethiopia. In line with the mission and vision of AAU, the CHS exercises unique roles in training highly skilled health professionals at MSc, PhD, specialty and subspecialty levels. This allows it to contribute to the expansion of quality health care, education and research in the country. The study was conducted from July to September, 2021 GC.

4.2 Study design

A retrospective secondary data like patient’s charts, biopsy and imaging review were used

4.2.1 Source population

All patients who were treated at AAU hospital TASH and affiliated hospital (St. PeterHospital), maxillofacial department from January 2020 to December 2021 G.C

4.2.2 Study population

All patients having benign Odontogenic tumor who were treated at TASH and affiliated hospitals, maxillofacial department from January 2020 to December 2021 G.C was taken as study population.

4.3 Sample size and sampling technique

4.3.1 Sample size Determination

All patients who were seen at TASH and affiliated hospitals, maxillofacial unit and diagnosed for benign Odontogenic tumor from January 2020 to December 2021 G.C were taken as the study samples from the mentioned charts. All the patients with fully recorded charts in the given time with the given diagnosis were taken as valid study sample size.

4.3.2 Sampling technique

From log/registration books the list of all patients seen during January 2020to December 2021G.C and diagnosed as having benign Odontogenic tumor together with their chart number were gathered. Using their chart number, their charts were regained from card room.

4.3.3 Inclusion criteria

All patients who were treated for confirmed benign Odontogenic tumor at maxillofacial surgery department in the study period with completed record are included in the study.

4.3.4 Exclusion criteria

Incomplete record chart: as data is from secondary sources like: patient cards', OPD and OR logo books, reading of images (soft copy or printed images was also revised when available. when this were not quite enough to fill data collection instruments, that specific case was excluded from the sample.

Patient's cards with incomplete medical record and different histopathology result of biopsy were excluded from the study.

4.4 Variables

4.4.1 4.5.1 Independent variables

Age Sex Address Duration of the lesion, Location of the lesion, Size of the lesion, Histopathology result, Type of operation	

Compliant after surgery	

4.4.2 Dependent Variables

Type of Benign odontogenic Tumor

4.5 Data collection procedures

Data collection was undertaken in September, 2021 in TASH and St. Peter Specialized hospital. Data was collected through medical record reviews of patients using a prepared data extraction format to collect information on socio-demographic, patient details, investigations, co morbidities, diagnosis. The data collection was done by four general Dentists with the supervision of oral and maxillofacial surgery resident.

4.5.1 Disease Identification

Identification of disease was done by using typical clinical, histopathology result or radiographic features documented in patient chart and the treatment given.

4.5.2 Disease Classification and Categorization

Disease classification and categorization was according to the standard text books of Oral and Maxillofacial surgery (Peterson's principles of oral and maxillofacial surgery) .

4.6 Operational definitions and Terms

Anterior region: -the area from one side of canine to the other side of canine.

Posterior region:-the area posterior to the canine, posterior area of the mandible included the Ascending ramus.

Upper jaw: - Alveolar process of the maxilla with the attached tooth.

Lower jaw: - Mandibular bone with the attached tooth.

Benign tumors: -grows slowly and is usually encapsulated and it enlarges by peripheral expansion, pushes away the adjoining structures and exhibits no metastasis, however, it may be locally aggressive.

Malignant tumors: -rapidly infiltrates the surrounding tissues, including vital structures and endangers the life of its host. It also shows metastasis in the distant parts of the body usually through lymph and blood streams.

Duration of lesion: - The time between diagnosis of tumor and treatment in weeks.

Incidence – the occurrence, rate or frequency of a disease or other undesirable things.

4.7 Data quality assurance

4.7.1 Pre-test

For consistency purposes, prior to data collection the data collection format was pretested on selected patient's chart those who shall not be included in the final study, so that the data collecting instruments were tested and based on the finding appropriate correction was taken including estimation of the time needed for data collection, data collector ability to understand it.

4.7.2 Data collectors training and supervision

The data collectors were trained on how to collect the data in an orientation session on study requirements including objectives of the study, definitions and the documentation processes, prior to data collection. The data collection process was rigorous patient chart review. The patient card number was used, to check validity and completeness of the information. The data collectors were strictly supervised daily and the principal investigator has reviewed all filled format so that any suggestion and corrections were given soon.

4.8 Data analysis

Descriptive statistics such as median, standard deviations (SDs) and tables were used to investigate the characteristics of the study subjects. Descriptive statistics were analyzed using Statistical Package for Social Sciences (SPSS) version 25.% confidence intervals were used as measures of association between the independent and outcome variable. A p-value of less or equal to 0.05 was considered statistically significant.

4.9 Ethical Consideration

Ethical clearance letter was obtained from Addis Ababa city government public health research and emergency management directorate and St. Peter`s specialized hospital ethical review committee office (ERCO).

4.9 Dissemination plan

The findings of the study will be disseminated to AAU, CHS, MOH, professional associations. Publication can also be considered on peer reviewed reputable journal.

Chapter-5

RESULTS

Socio-demographic characteristics

According to the review of the medical cards, a total of 68benign Odontogenic tumor cases were treated at TASH and affiliated hospitals, maxillofacial unit from January 2020 to December 2021 G.C, Addis Ababa, Ethiopia. Out of these, 55 medical cards fulfilled the inclusion criteria of the study. From the total 55 reviewed medical cards, 28 (50.9 %) were males, while the remaining 27 (49.1 %) were females. The majority, 18 (32.7 %) of patient's age ranged between 11 and 20 years. 35 (63.6 %) of the participant were living in rural areas of the country (Table 1).

Table 1:- Socio-demographic characteristics of patients with the diagnosis of OT, at AAU, CHS affiliated hospitals (dental center and St. Peter Specialized Hospital).

Socio-demographic characteristics	**Frequency (%)**
Gender	
Male	28(50.9)
Female	27(49.1)
Age	
0-10	2(3.6)
11-20	18(32.7)
21-30	14(25.5)
31-40	8(14.5)
41-50	6(10.9)
>50	7(12.7)
Residency	
Urban	20(36.4)
Rural	35(63.6)
Total	55(100)

Frequency of OT cases diagnosed in each Year

Concerning the number of OT cases diagnosed, the majority 31 (56.4%) of the patients were diagnosed in the year of 2021. In contrast, 24 (43.6 %) were diagnosed in the year of 2020(Fig 1).

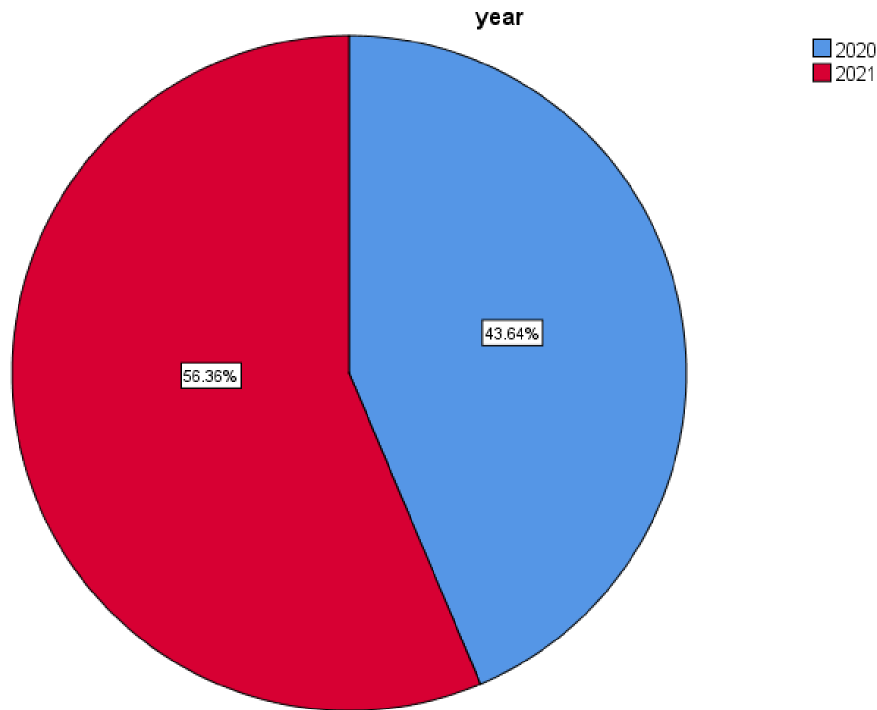

Figure 1:-Frequency of OT cases diagnosed in Year 2020 &2021

Frequency of OTs by the year of presentation

In this study, the majority 39 (70.9 %) of OT cases were presented after 1 year of onset of symptoms. On the other hand, 16(29.1 %) of the cases were presented before 1 year of onset of symptoms (Fig 2).

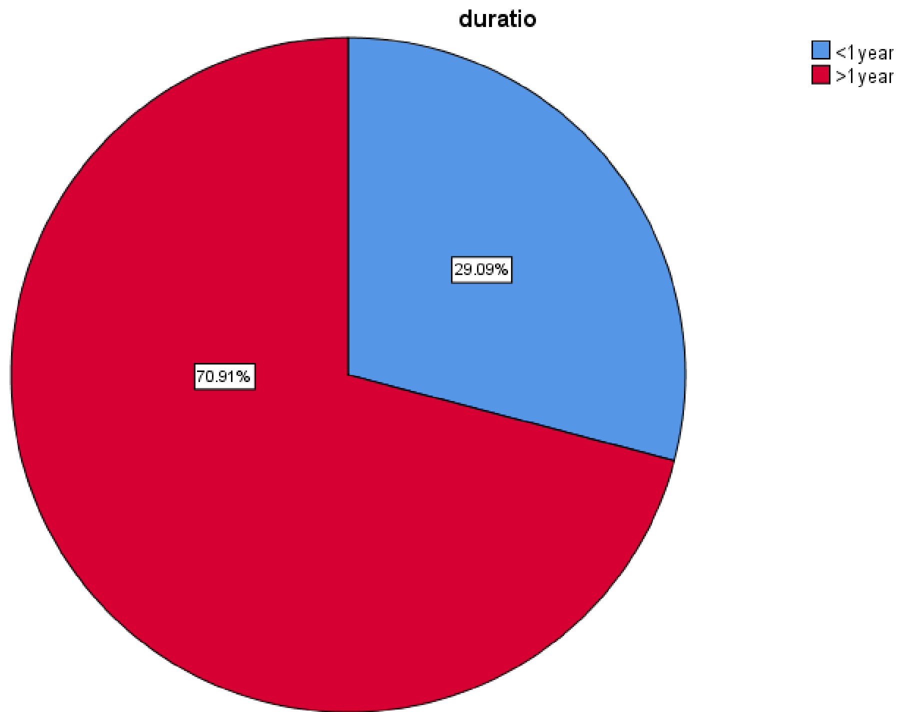

Figure 2:- Frequency of OTS diagnosed by the year after onset of symptoms

Classes of Odontogenic tumors

The most frequent type of benign Odontogenic tumor was ameloblastoma (32.7 %) followed by Keratocystic OT (okc)(25.5 %).(Table 2).

Table 2:-Frequency distribution of Odontogenic tumors according to the recent WHO classification, at AAU, CHS affiliated hospitals (dental center and St. Peter Specialized Hospital).

Types of benign Odontogenic tumor	Frequency	Frequency in %
Ameloblastoma	18	32.7
Odontogenic myxoma	5	9.1
Keratocystic OT (okc)	14	25.5
Odontogenic fibroma	4	7.3
Calcifying epithelial odotogenic tumor	5	9.1
Odontoma	6	10.9
Others	3	5.5
Total	55	100

Distribution of Odontogenic tumors by sex

OTs were presented in both genders with almost similar distribution, about 50.9 % in males, and 49.1 % in females. The male to female ratio was 1.04: 1.(Table 3).

Table 3:-Distribution of Odontogenic tumors by sex in line with the recent WHO classification,at AAU, CHS affiliated hospitals (dental center and St. Peter Specialized Hospital).

Types of Benign Odontogenic tumors	Gender		Total	Male to female ratio
	Male	Female		
Ameloblastoma	10	8	18	1.25
Odontogenic myxoma	3	2	5	1.5
Keratocystic OT (okc)	5	9	14	0.56
Odontogenic fibroma	3	1	4	3:1
Calcifying epithelial odotogenic tumor	4	1	5	4:1
Odontoma	2	4	6	0.3
Others	1	2	3	0.5
Total	28	27	55	1.04

Distribution of different classes of OTs by age

The age of patients diagnosed with OT ranged from 6-68 years with a mean age of 30.4 years. 18 (32.7%) of patients with the diagnosis of ameloblastoma were most common within the age group of 21-30 year. The second common OT was Keratocystic OT (okc) which is common in the age group of 21-30(Table 4).

Table 4: Distribution of benign Odontogenic tumors by age, according to the recent WHO classification of benign Tumors, TASH and its affiliated hospitals, Addis Ababa, Ethiopia, 2021

types of benign Odontogenic tumors	Age In years					
	0-10	11-20	21-30	31-40	41-50	>50
Ameloblastoma	0	6	7	3	1	1
Odontogenic myxoma	0	2	2	1	0	0
Keratocystic OT (okc)	0	4	5	2	1	2
Odontogenic fibroma	1	0	0	0	1	2
Calcifying epithelial odotogenic tumor	0	3	0	1	0	1
Odontoma	0	3	0	1	2	0
Others	1		0		1	1
Total	2	18	14	8	6	7

Odontogenic tumors by location

In this study, tumors were sited at every place. However, Posterior mandible was the most frequently affected site corresponding to 26(47.3%) of the cases, while the Anterior Maxilla was affected in 12(21.8%) of the cases. Based on this serious, the mandible was the most commonly affected site. Of the different classes of OTs affecting the mandible, ameloblastoma, Keratocystic OT (okc) , Odontogenic myxoma, were the frequently found tumor types among the patients. Similarly, Odontoma and keratocystic Odontogenic tumor were the commonly diagnosed OT types affecting the maxilla (Table 5).

Table5: Distribution of benign Odontogenic tumors by place of occurrence according to the recent WHO classification, TASH and its affiliated hospitals, 2021

Types of benign Odontogenic tumors	Anterior Maxilla	posterior Maxilla	Anterior mandible	Posterior mandible	mandible :Maxilla
Ameloblastoma	3	0	5	10	5
Odontogenic myxoma	1	1	0	3	3:2
Keratocystic OT (okc)	3	3	0	8	1.3
Odontogenic fibroma	1	0	2	1	3:1
Calcifying epithelial odotogenic tumor	2	1	0	2	2:3
Odontoma	2	1	1	1	2:3
Others	0	2	0	1	1:2
Total	12	8	9	26	

Surgical Treatment and its complications

From the 55 patients that were treated at TASH and its affiliated hospital, 21 (38.2 %) of patients had enucleation and curettage whilst 11 (20 %) had marginal resection. In addition hemi-maxillectomy were performed in 8 (14.5 %) of the treated patients. Concerning the complications after surgical treatment, parasthesia 7(12.7%), continuity defects 7(12.7%), recurrence 6(10.9%) and malocclusion 3(5.5%), were seen in patients that had surgical treatment, respectively. However, out of the total 55 patients who had surgery, 20 (36.4%) of them had no any complication after surgery (figure 3 &4)

Figure 3 &4: Frequency distribution of surgical treatment of benign Odontogenic tumors at TASH and its affiliated hospital, Addis Ababa, Ethiopia, 2021

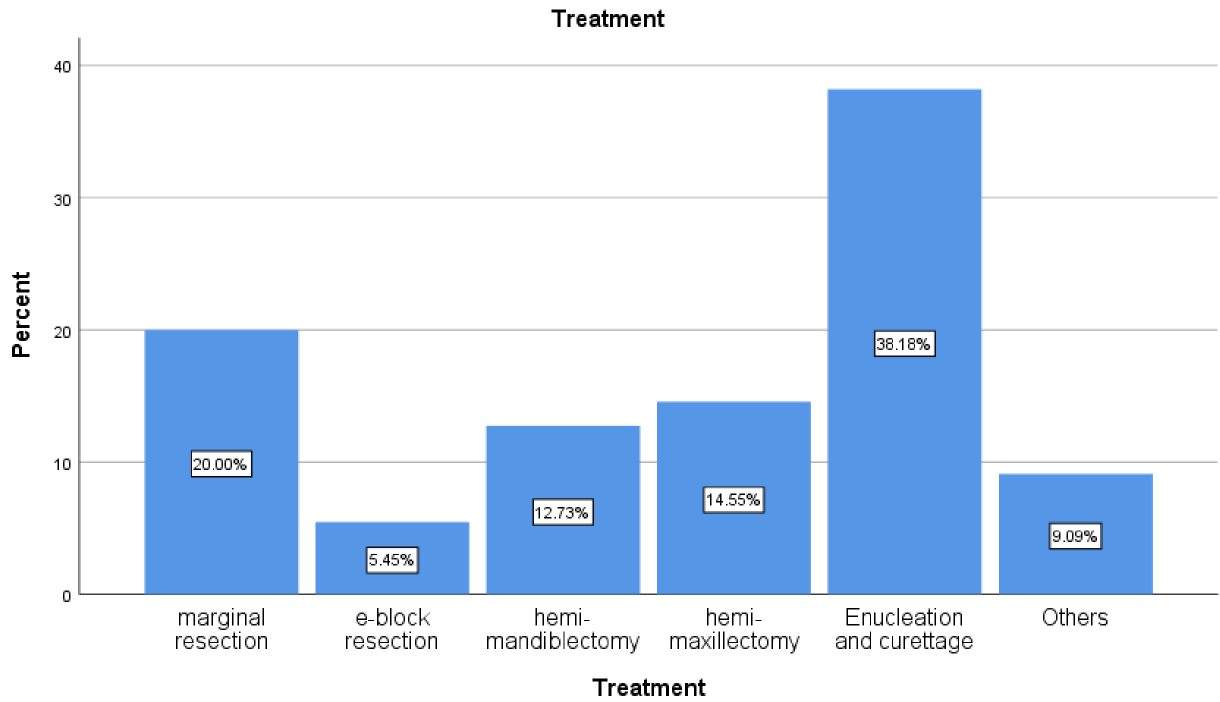

Figure 3:-Frequency distribution of surgical treatment of benign Odontogenic tumor

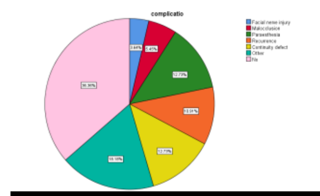

Figure 4:-Frequency distribution of surgical complications of benign Odontogenic tumors

CHAPTER-6

DISCUSSIONS

Discussions

Studies of OT among population are crucial for identification of the population groups at risk, possible factors associated to their development, and to develop more precisely differential diagnoses .Despite this fact, studies of OTs are very scare in Ethiopia. Therefore, we aimed at investigating the distribution of OTs in Ethiopian over a period of 2 years. In the present study, a total of 55 cases, 28 (50.9%) males and 27(49.1 %) females were included. The majority, 18 (32.7 %) of them were within the age range of 11-20years old. On the other hand, 35(63.6 %) of the participant live in the rural areas, while the remaining 20 (36.4%) in urban areas. Concerning the year of diagnosis, the majority, 31 (56.4%) of the patients were diagnosed in the year of 2021. On the other hand, 24 (43.6 %) cases were diagnosed in 2020. Furthermore, 39 (70.9 %) of OT cases were presented to TASH and its affiliated hospitals after 1 year of OT presentation, whereas 16 (29.1 %) of the cases were presented before 1 year of OT presentation, which increases complications.

Concerning the pattern of OT types, in the present study, ameloblastoma was the most frequent type of all OTs accounting for about 32.7 % of all OTs. This finding is similar to studies conducted in Pakistan (23), India (24), Kenya (17), Nigeria (23, 25) and Tanzania (26).

Additionally Keratocystic OT (okc) was found to be the second most common (25.5 %) OTs in this study. This finding is lower compared to a study conducted in Pakistan (3) and higher compared to a study conducted in China (4). This observed variation could probably be because of small sample size in this study. Likewise, Odontoma was found to be the third most common type of OT seen in this study which accounted for about 10.9 % of all OTs. This finding is consistent to a study conducted in Nigeria (29). Furthermore, the remaining OTs types such as myxoma, Odontogenic fibroma and calcifying cystic OT, accounted for about 25.5 % of the total OTs. In the present study, OT occurred in males more frequently than in females. This finding is in accordance with other studies reported from Pakistan (23) and Nigeria (16, 25). In contrary, studies conducted in Ceará, Brazil (18), Rio Grande do Norte, Brazil (19) and Mumbai, India (24) reported that OTs are more common among females than their counter male partners. Regarding the distribution of specific OT types, ameloblastoma was slightly higher (55.5 %)

among males than the females. This finding is similar to studies done in Nigeria (16, 24, 2 9), India (23), and Argentina (8). So as to myxoma, it affected more males than females with sex ratio of 1.5. This finding is similar to studies conducted in Nigeria (16, 29).

Regarding the distribution of OT by age, OTs were most frequent in the second and third decades of life among our study patients. This finding is similar to previous reports from Pakistan (24), Diyarbakýr, Turkey (8), Argentina (9),Ceará, Brazil (18) and Rio Grande do Norte, Brazil (19). In relation to distribution of different OT types by age, 7 (38.89 %) Amelobastoma cases were within the age group of 21-30. This finding is comparable to studies conducted in Pakistan (26), Brazil (31), Nigeria (22, 24) and India (23).

Likewise, 5(9.1%) of myxoma cases were commonly seen from 2nd to 4th decades of life, a result similar to studies conducted in Nigeria (16, 29). Regarding location of OT, 63.6 % of all OTs were observed in the mandible, whereas the remaining 36.4% were located in the maxilla among our study patients. This finding is similar to reports from Diyarbakýr, Turkey (8), Buenos Aires, Argentina (9), Kenya (17), Ceará, Brazil (18), Rio Grande do Norte, Brazil (19), Pakistan (23), Mumbai, India (24), Nigeria (22,25), and Tanzania (26). Concerning to individual cases, mandible was found the most common site in about 83.3 % of ameloblastoma cases. This finding is comparable to studies conducted in Nigeria (16, 24, 29), India (23), and Argentina (8). Similarly, mandible was the most commonly affected site in myxoma cases, a finding similar to reports from Argentina (8) and Nigeria (29). Treatments of OTs are generally classified as conservative or aggressive. Conservative treatment usually includes simple enucleation with or without curettage, marsupialization , peripheral ostectomy, chemical curettage with Carnoy's solution ,Aggressive treatment principally includes cryotherapy or electrocautery and surgical resection .Resection of the tumor with adequate margin of normal bone was satisfactory for locally invasive tumors like ameloblastoma, Odontogenic fibromyxoma, KCOT and myxoma. On the other hand, the use of enucleation and curettage leads to recurrence of these lesions. In this study, about 10.91% of the cases had history of recurrence, a finding which is higher compare to a study conducted in Nigeria (22). This might be due to inappropriate diagnosis of the cases leading to wrong surgical treatment. In this study hospital, obtaining biopsy results are extremely time consuming. As a result, surgical treatments are given for those patients without definitive diagnosis supported by biopsy which was the cause for in appropriate treatment and recurrence.

The present study showed statistically significant association between two variables: place of residence and tumor size, with the dependent variable complication after surgery, particularly in the case of rural people most of them came to the hospital after the mass distort their face and attain large size. Living in the rural areas had more likely chance of having complication after surgery than living in the urban areas because, they came late for treatment. In addition, an increase in the size of tumor increased the chance of having complication after surgery. To my knowledge this is a first finding showing these associations. However, the association could be explained by the fact that dental services in general and maxillofacial services in particular are extremely scare in Ethiopia, moreover in the rural parts. Thus, patients from the rural area would have a late presentation to dental and/or maxillofacial clinics. This late presentation of cases in turn could result in large sizes of OTs. As a consequence, necessitates wide surgical procedures to be carried out for the treatment. Hence, patients will have a higher chance of having complications after surgery.

Strengths and limitations

Strength of the study

All inclusion criteria's were fulfilled for sample selection to meet the specific objective of the study group.

Collection of data was done under strict quality control.

Limitation of the study

Some of the patient's charts were lost from the shelf while some others were incomplete that made them difficult to include in the study sample.

The study was unable draw valid conclusion regarding the impacts of patients social history like their jobs and use of illicit substances on causes of OTs as these were not well documented in the patient's charts.

CHAPTER-7

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The present study showed different patterns of OTs in different age groups and two genders. Most of the OTs cases were diagnosed from rural area. Furthermore, participants came to the hospital after greater than one year duration of presentation.

Ameloblastoma and Keratocystic OT (okc) were the most common diagnosed benign OTs. OT cases were more frequently seen among males within second and third decades. Intriguingly, posterior mandible was the commonest site involved. Furthermore, complication after surgery has significant association with tumor size and place of residency.

Recommendations

I believe that this report will create awareness among health care workers in general, and dentists in particular about OTs. Preventive mechanisms and early case detection could have a substantial role in minimizing the consequences of OTs. Therefore, the ministry of health should put an effort in increasing the services of dentistry in alliance with other medical services at different health institutions in all parts of the country. Moreover, dentists should create awareness among health workers about preventive and early diagnosis of OT cases. Furthermore, health care workers should create awareness among the community about the consequences of OTs. Finally, the community needs to bring behavioral change in having a habit of regular visit to dentists.

Annex I: References

1. J Bánóczy, PE Petersen, AJ Rugg-Gunn. Milk fluoridation for the prevention of dental caries.Geneva, 2009.

2. Abdulai AE et al. Jaw Tumors in Ghanaian Children and Adolescents: A Retrospective Study. World J Surg Med RadiatOncol, 2012; 1: 83-90.

3. Akram S, Naghma, Ali MA, Shakir MM. Prevalence of Odontogenic Cysts and Tumors in Karachi, Pakistan. J Dow Uni Health Sci, 2013; 7(1): 20-24.(18).

4. H.-Y.Lou, T.-J. Li .Odontogenic tumors: A study of 1309 cases in a Chinese population. Oral Oncology, 2009;45: 706–711.

5. Jing et al. odontogenic tumors: a retrospective study of 1642 cases in Chinese population. Int. J. Oral MaxillofacSurg, 2007;36: 20–2 doi:10.1016/j.ijom.2006.10.011.

6. Barnes L, Eveson J, Reichart P, Sidransky D World Health Organization classification of tumors (Pathology and genetics of head and neck tumors). In: IARC Press, Lyon 2005; 285.

7. Moridani*et al.* a 7 year retrospective study of biopsied oral lesions in 460 biopsied oral lesions in 460 Iranian patients. RSBO, 2014;11(2):118-24.

8. Guerrisi M., Piloni M.J, Keszler A. Odontogenic tumors in children and adolescents: A 15-year retrospective study in Argentina. Med Oral Patol Oral Cir Bucal, 2007; 12:E180-5.

9. LB BORGES et al. Odontogenic lesions of the jaw: a clinical-pathological study of 461*cases.* RGO, 2012; 60(1): 71-78.

10. LA Gaita´n-Cepeda et al. Reclassification of odontogenic keratocyst as tumor: Impact on the odontogenic tumors prevalence. Oral Diseases, 2010; 16: 185–187.

11. Ramachandran S, Rajeshwari GA, Ali IM, Sree GV. Odontogenic keratocyst – A silent tumor. JPBMS 2013; 32(32): 1292-1298.

12. N.R. Johnson et al. Systematic review of odontogenic cysts and tumors. Journal of Investigative and Clinical Dentistry, 2014;5: 9–14.

13. Khajeh AS, Rahpeyma A. Central Odontogenic Fibroma of the Mandible. JDMT, 2012; 1(2): 70-73. 29

14. Tanrýkulu R, Erol B, Haspolat K. Tumors of the maxillofacial region in children: retrospective analysis and long-term follow-up outcomes of 90 patients. Turk J Pediatr, 2004; 46: 60-66.

15. Peter E. Larsen, Arden K Hegtvedt. Chapter 78: Odontogenesis and Odontogenic Cysts and Tumors. Accessed from: http://famona.tripod.com/ent/cummings/cumm078.pdf on December, 2014.

16. Lawal AO, Adisa1 AO, Popoola BO. Odontogenic tumors in children and adolescents: a review of forty-eight cases. Ann Ibd. Pg. Med, 2013; 11(1):7-11.

17. F. M. A. Butt *et al.* 19-year audit of benign jaw tumors and tumor-like lesions in a teaching hospital in Nairobi, Kenya. Open Journal of Stomatology,2012; 2:54-59.

18. Linard RA1, AzoubelAA,Santana T de S ,Sávio E deSA, Dourado E. Odontogenic tumors: clinicaland pathology study of 238cases. Rev Bras Otorrinolaringol, 2008; 74(5):668-73.

19. Santos JN, Pereira pinto L, Figueredo CRLV de, Souza LB de. Odontogenic tumors: analysis of 127 cases. PesquiOdontol Bras, 2001; 15(4):308-313.

20. Sharif FNj, Oliver R, Sweet C, Sharif MO. Interventions for the treatment of keratocystic odontogenic tumours (KCOT, odontogenic keratocysts (OKC)).Cochrane Database Syst Rev, 2010; 8(9):CD008464. doi: 10.1002/14651858.CD008464.pub2.

21. Malheiro P, Feio L, Costa H. Unicystic Plexiform Ameloblastoma. Revista de saúdeamatolusitano, 2013; 32:52-54.

22. Anyanechi CE, Saheeb BD. A review of 156 odontogenic tumors in calabar, Nigeria. Ghana Medical Journal, 2014; 48(3):163-167.

23. Varkhede A, Tupkari JV, Mandale MS, Sardar M. Odontogenic tumors: a review of 60 cases. J ClinExp Dent, 2010; 2(4):e183-6.

24. Ladeinde et al. Odontogenic tumors: A review of 319 cases in a Nigerian teaching hospital. Oral Surg Oral Med Oral Pathol Oral RadiolEndod, 2005;99(2):191-5

25. Simon ENM, Stoelinga PJW, Vuhahula E, Ngassapa D. Odontogenic tumors and tumors like lesions in Tanzania. East African Medical Journal, 2002;79(1):3-7.

26. IramNaz et al. Clinicopathological Evaluation of Odontogenic Tumors in Pakistan - A Seven Year Retrospective Study. Asian Pac J Cancer Prev, 2014;15 (7): 3327-3330

27. Accessed from: https://www.us.elsevierhealth.com /media/us/samplechapters/ 9780443100536/9780443100536.pdf on December, 2014.

28. F. Çizmecişenel, e. H. Dayisoylu, ş. Ersöz, n. Yilmaz altintaş, e. Tosun c. Üngör, f. Taşkesen. The relative frequency of odontogenic tumors in the Black Sea region of Turkey: an analysis of 86 cases. Turk J Med Sci, 2012; 42 (Sup.2): 1463-1470.

29. Ajayi OF, L LadeindeAL, AdeyemoWL, OgunleweMO. Odontogenic tumors in Nigerian children and adolescents- a retrospective study of 92 cases. World Journal of Surgical Oncology, 2004; 2:39 doi:10.1186/1477-7819-2-39

30. Bassey GO, Osunde OD, Anyanechi CE. Maxillofacial tumors and tumor-like lesions in a Nigerian teaching hospital: an eleven year retrospective analysis. African Health Sciences, 2014;14(1): 56-63 http://dx.doi.org/10.4314/ahs.v14i1.9

31. Costa DOP, Maurício AS, Faria PAS, Silva LE, Mosqueda-Taylor A, Lourenço SQC. Odontogenic tumors: A retrospective study of four Brazilian diagnostic pathology centers. Med Oral Patol Oral Cir Bucal, 2012 May 1; 17 (3):e389-94.

32. Ebenezer V, Ramalingam B. A Cross-Sectional Survey of Prevalence of Odontogenic Tumours. J. Maxillofac. Oral Surg, 2010; 9(4):369–374. DOI 10.1007/s12663-011-0170-8.

33. Kowkabi M, Razavi SM, Khosravi N, Navabi AA. Odontogenic tumors in Iran, Isfahan: A study of 260 cases. Dent Res J, 2012; 9: 725-9.

34. Robles P &Roa I. Keratocystic odontogenic tumor: Clinicopathological aspects and treatment. J Oral Res 2014; 3: 249-256.

35. Yigzawkebede. Cigarette smoking and khat chewing among college students in North West Ethiopia. ethiop.J.healthDeve, 200216:9-17.

Annex II: Data Collection Instruments

DATA CALLECTION FORMAT

Instruction for data collectors:

1. Identify the card number of patient's with the diagnosis of benign Odontogenic tumor from the registration book of Maxillofacial Surgery Department, TASH and St Peter Hospitals from 2020-2021.
2. By using these card numbers, collect all the medical cards from the card storage room of St. Peter and TASH hospital.
3. Check for the completeness of medical records from all identified cards by ticking on the checklist under "data present" column. If any of the data is missing, exclude the card.
4. Fill in the checklist accordingly

Ser. No	Date Present	Information to be filled	Proposed response	Coded response
1.		Code number		
2.		Card number		
3.		Age		
4.		Sex	Male	
			Female	
5.		Present address		
6.		Location of the lesion	Posterior mandible	
			Anterior mandible	
			Posterior maxilla	
			Anterior maxilla	
			Others……………………	
7.		Duration of the lesion		
8.		Size of the tumor		
9.		Histopathological result	1.Keratocystic Odontogenic tumor	
			2. Ameloblastoma	
			3. Odontoma	
			4. Odontogenic myxoma	

			5 .Calcifying Epithelial Odontogenic tumor	
			6. Odontogenic fibroma	
			7. others	
10.		Treatment	marginal resection	
			e-block resection	
			hemi-mandiblectomy	
			hemi-maxillectomy	
			Total maxilloectomy	
			Total mandibilectomy	
			Enucleation and curettage	
			Others………………….	
11.		Complication after surgery	Malocclusion	
			Paraesthesia	
			Facial nerve injury	
			Continuity defect	
			Recurrence	
			Others	