OCCURRENCE, CLINICOPATHOLOGICAL CHARACTERISTICS AND TREATMENT MODALITIES OF OROFACIAL TUMOURS AND TUMOUR-LIKE LESIONS IN CHILDREN TREATED AT MUHIMBILI NATIONAL HOSPITAL, DAR ES SALAAM, TANZANIA

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M.Dent (Oral & Maxillofacial Surgery) Dissertation
Muhimbili University of Health and Allied Sciences
October, 2017

Muhimbili University of Health and Allied Sciences

Department of Oral & Maxillofacial Surgery

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By

Gift G. Natana, BDS

A Dissertation submitted in (Partial) Fulfillment of the Requirements for the Degree of Master of Dentistry in Oral & Maxillofacial Surgery of

Muhimbili University of Health and Allied Sciences
October, 2017

CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a Dissertation titled: ***"Occurrence, clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children treated at Muhimbili National Hospital, Dar es salaam, Tanzania"*** in (partial) fulfillment of the Requirements for the Degree of Master of Dentistry in Oral & Maxillofacial Surgery of Muhimbili University of Health and Allied Sciences.

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Date

DECLARATION AND COPYRIGHT

I, **Dr Gift G. Natana**, declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature: …….. **Date:**……

ACKNOWLEDGEMENT

I would like to thank the Almighty God the author and sustainer of our life, who has seen me through this journey from its beginning to the end. I pay special tribute to my late father Gibson F. Jadri whose living memory continues to inspire me; my mother Grace F. Yupete and aunt Mary S. Jadri for their prayers, toil and sacrifice which culminated into this achievement. I would also like to convey sincere thanks and appreciation to my first supervisor Dr. Boniphace M. Kalyanyama who generously offered his time and expertise throughout the different stages of the development of this text. I will remain indebted for his valuable guidance, and careful attention to details which greatly eased my task. My wholehearted appreciation also goes to Dr. Elison N. M. Simon the Dean of the School of Dentistry and my second supervisor whose advice, support, critical insight and comments made this work to finally come to this form.

I owe special gratitude to the senior management of MUHAS for their understanding and support which ensured unhindered completion of my final year. My appreciation to all my mentors Dr. Jeremiah Moshy the head of the department, Dr. Farrid M. Shubi and Dr. Sira S.Owibingire in addition to all the staff, fellow colleagues at the Oral & Maxillofacial Surgery department MNH for continued support and advice during my period of study. Of special mention is Dr. Shaban D. Shaban the chief Maxillofacial Surgeon at MNH, whose passion for Maxillofacial Surgery, in-depth knowledge and skill was exemplary. I am grateful to Gordon Memorial College Trust UK for sponsoring my final year and to all those who have at a point helped me to successfully accomplish this academic feat. Last but not least, special compliments and recognition to the children and their parents/ guardians who accepted to be part of this study.

DEDICATION

This dissertation is dedicated to my beloved wife, colleague and friend Dr. Lucy and our children Gibson, Dorcas and Deborah who was born during this journey, for their presence, sacrifice and support.

ABSTRACT

Background

Children with orofacial tumours and tumour-like lesions who were treated at the Oral and Maxillofacial Surgery department Muhimbili National Hospital (MNH) were often seen to have huge swellings which caused marked facial deformity and at times functional difficulties. The clinical presentation, pathological characteristics and treatment modalities of these lesions were quite diverse and warranted an investigation to assess their burden in Tanzanian children. It's envisaged that the data obtained will help the clinicians at the Oral & Maxillofacial department MNH and other healthcare institutions in early detection and appropriate management of children with these lesions.

Objective: To determine the occurrence, clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children who were treated at Muhimbili National Hospital, Dar es Salaam, Tanzania during the period from September 2016 to March 2017.

Methods: This cross-sectional hospital-based study was conducted in the Oral and Maxillofacial Surgery and Otorhinolaryngology departments at MNH. Children aged below 18 years with orofacial tumours and tumour-like lesions or their parents/guardians were interviewed using a structured questionnaire and clinical examination of the patients were done and the details recorded in the clinical form. Data analysis was done using statistical package for social sciences (SPSS) version 20.0. Level of statistical significance was considered at a P-value of < 0.05.

Results: A total of 121 children aged 4 days old to 17 years (mean= 8.56 years ±5.5 SD) participated in the study, of whom 52.1% were males. The age groups 0-5 years (38%) and 11-15 years (28.1%) were most affected by orofacial tumours and tumour-like lesions. Majority 86% of the lesions were benign whereby haemangioma was the most common benign tumour encountered (16.4%), followed by lymphangioma (13.6%). The most frequent tumour-like lesion observed was the dentigerous cyst (7.8%), followed by the dermoid cyst and fibroma in

4.1% of participants. Burkitt's lymphoma and squamous cell carcinoma were the most common malignant lesions encountered in 23.5% participants in that category. All the lesions in this study presented with swelling as a common clinical feature in both benign and malignant tumours and tumour-like lesions. Surgery was the most common modality of treatment employed.

Conclusion: Orofacial tumours and tumour-like lesions were relatively common in children seen in this study. Delay and late reporting for treatment was noted in many children with orofacial tumours and tumour-like lesions. Benign orofacial lesions are more common than malignant tumours in children in this study. Due to overlapping of clinical presentation between benign and malignant lesions, clinicians must establish histological diagnosis of every tumour before initiating definitive treatment. Surgery was the main treatment modality used for orofacial tumours and tumour-like lesions in this study.

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ABBREVIATIONS

BDS	Bachelor of Dental Surgery
BL	Burkitt's lymphoma
CT scan	Computed Tomography Scan
DOPD	Dental out-patient department
DSM	Dar es Salaam
FNAC	Fine needle aspiration cytology
HIV	Human Immunodeficiency Virus
MNH	Muhimbili National Hospital
MRI	Magnetic resonance imaging
MTCT	Mother-to-child-transmission
MUHAS	Muhimbili University of Health and Allied Sciences
OMFS	Oral and Maxillofacial surgery
OPG	Orthopantomograph
ORL	Otorhinolaryngology
SD	Standard deviation
SPSS	Statistical Package for Social Sciences
USS	Ultrasonography

DEFINITION OF TERMS

In this study these terms have the following meanings:

A tumour: is an abnormal mass of tissue formed by a new growth of cells due to a genetic transformation, it may be benign or malignant.

Tumour-like lesions: are abnormal masses of tissue that mimic a tumour but have no genetic trigger, may be due to hyperplasia, inflammation, a reactive or reparative process.

A child: is any person below the age of 18 years.

Orofacial region: is the anatomical area comprising of oral cavity and the face extending from the hairline above to the mandible below and includes hard and soft tissues.

Assent form: an agreement by an individual not competent to give legally valid informed consent i.e. children above 15 years but less than 18 years.

CHAPTER ONE

1.0. INTRODUCTION AND LITERATURE REVIEW

1.1 Background

Neoplasms are a rare occurrence in the paediatric age group, but orofacial tumours and tumour-like lesions may occur at any age. These tumours can arise from any tissue, either soft or hard and can spread to involve the surrounding tissues. Some of these tumours are unique, like odontogenic tumours that only occur in the maxillofacial region (1). The rate of growth of these tumours depends on the nature of the lesion which may be hamartomas, benign and malignant with the latter being characterized by fast growth (2). In recent years there was an increasing incidence and prevalence of these lesions, making the tumours a significant cause of morbidity and mortality in children (3). The incidence of childhood cancer differs slightly between different regions of the world, with the risk of 1-2.5 per 1000 to those aged below 15 years (4)

Basically, children don't differ from adults in size only but also in the predilection of certain lesions (5). The spectrum of diseases seen in this age group differs from that in adults (6). When the diseases are similar, there are sometimes differences in their clinical behavior (7). The bulk of orofacial neoplasms affecting children and adolescents are mostly benign (8). These neoplasms may present with a myriad of clinical features due to their special location and might result in expansion and destruction of adjacent structures (9). It has been observed that the features of many paediatric lesions change with growth and development of the body and thus their management changes as well (10).

Diagnosis of orofacial tumours and tumour-like lesions depends on thorough history and physical examination, followed by appropriate imaging studies, when indicated (11). An array of radiographic and imaging studies is used to ascertain the features of the lesion which are often characteristic (12). But the mainstay of diagnosis of neoplasms is the histopathological

confirmation of a lesion through a biopsy in form of either fine needle aspiration cytology or tissue biopsy (7).

The presence of these tumours and their eventual treatment is associated with several problems. Some may cause disfigurement and especially the malignant types if not detected early can lead to extensive tissue destruction and metastasis (13). It is imperative for the clinicians involved in the diagnosis and treatment of paediatric head and neck tumours to understand the patterns of development of these lesions, so that misdiagnosis and delays in treatment can be avoided and the untoward effects of treatment minimized in the growing and developing child (7,15).

Various reports in the literature from different parts of the world have discussed the frequency, clinical presentation, histopathological characteristics and management of orofacial tumours and tumour-like lesions in children. Making comparisons on the results of these parameters among the available data is difficult due to differences in the criteria used in each study, classification, the upper age limit, racial-ethnic origin of the population, hereditary and geographic factors (10,16). In East Africa, some investigators have reported on these neoplasms in the past years but these were few in number (16).

Data on the orofacial tumours in Tanzanian children were published in few studies (17,18). However, over the course of time changes might have happened in some of the findings and conclusions. Therefore, the aim of the present study was to investigate the occurrence, clinicopathological characteristics and the modalities of treatment in children who presented with orofacial tumours and tumour-like lesions at Muhimbili National Hospital, Dar es Salaam Tanzania.

1.2 Literature Review

1.2.1. The frequency of orofacial tumours & tumour-like lesions in children in different parts of the world

Several studies have documented the occurrence of orofacial tumours and tumour-like lesions in children and results from these studies vary in different parts of the world (19). It is apparent that various factors contributed to these diverse conclusions in each study population; these were mainly geographic, genetic, cultural and socioeconomic in nature. Data regarding orofacial tumours and tumour-like lesions from Asia show marked differences in the relative frequency of these lesions. According to studies by Ashkavandi et al., (2011) and Saravani et al., (2015) in two different cities in southern Iran the prevalences were 2.8% and 13.9% respectively (11,12), while Wang et al., (2009) in Taiwan reported a prevalence of 6.6% (10). A similar result was reported by Chen et al., (1998) in southern Taiwan in an earlier study (22). Whereas, a retrospective study by Krishnan et al., (2014) in India revealed a frequency of 10.5% of orofacial tumours and tumour-like lesions in this age group (21).

In South America, Mouchrek et al., (2011) found a frequency of 2.5%; however, higher rates ranging from 6.6% to 13.1% were reported from different parts of Brazil (4,15-17). Guerrisi et al., (2007) in a study conducted in Argentina on odontogenic tumours in children and adolescents reported an occurrence of 7% (8). A much higher frequency of 20.6% was reported by Zuniga et al., (2012) in a Chilean paediatric population (25). In Europe, orofacial lesions in children were studied by Requeijo et al., (2012) in Spain and Skiavounou et al., (2005) in Greece, the frequency of children affected by these lesions were 1.7% and 2.4% respectively (27,28). These frequencies were relatively low, compared to the rates in studies involving populations from several developing countries. Results of a study by Cesmebasi et al., (2014) in the United States of America revealed that head and neck tumours accounted for approximately 5% of all paediatric tumours (28). In Australia, a study on oral and maxillofacial pathology in children by Ha et al., (2014) reported a frequency of 14.2% (29).

In Africa, studies conducted in different parts of the continent have demonstrated significantly higher prevalence of orofacial tumours and tumour-like lesions in paediatric population. Aregbesola et al., (2005) in southwestern Nigeria and Omoregie et al., (2014) in Ghana documented frequencies of 28% and 13.5% respectively in children younger than 16 years (30,31). Elarbi et al., (2009) in Libya studied these lesions in children and reported a frequency of 8.9% in those who underwent biopsy for various reasons in the orofacial region (14). While in Uganda Kamulegaya et al., (2011) reported 29.3% frequency (32).

1.2.2. Clinical presentation of orofacial tumours and tumour-like lesions in children

1.2.2.1. Age distribution of patients

The age of a person is one of the important parameters in the clinical diagnosis of certain lesions (33) since some lesions have a predilection for a specific age group. Studies assessing the age break-up in the occurrence of tumours and tumour-like lesions in children have shown a series of results. In Kenya a study by Butt et al., (2012) on benign tumours and tumour-like lesions of the jaws, there were remarkably few participants below the age of 9 years who presented with these lesions (34). This finding was consistent with that of another study by Omoregie et al., (2014) in Ghana who reported a mean age of 9 years (31). In Libya Elarbi et al., (2009) found that most participants were in the age group 10-18 years (14). Several other studies showed similar findings (20,22,24,25). In contrast to this, Fattahi et al., (2015) reported that the minimum age of the children studied was 2 days and the maximum age was 12 years, with a mean of 5.2 years (36); similar findings were reiterated by Rwakatema et al., (2011) (18). Consequently, these studies concluded that the most affected paediatric age group were between 10-18 years and the least affected were 0-6 years (10,16,21).

1.2.2.2. Sex distribution

The information about the prevalence of orofacial tumours and tumour-like lesions in children according to sex was reported by numerous studies. The findings of the study by Kalyanyama et al., (2002) showed a slight predilection of 53% for boys as compared to 47% for girls with a ratio of 1.9:1. It was observed that some lesions became more prevalent in the opposite sex as the children grew (17). Vale et al., (2013) reported a male to female ratio of 1:1.4 (25,31).

Overall, malignancies were found to be more common in males than females and the male to female ratio was 1.3:1 (37).

1.2.2.3. Location of the tumour

With regard to distribution according to tumour mass location, it is important to emphasize that it follows the nature of the lesion whether benign or malignant. The existing data on benign lesions confirm that the tumours occurred more often in the mandible (72.8%) than in the maxilla (27.1%) giving a maxilla to mandible ratio of 1:2.7 (38). Contrary to this, Lima et al., (2008) reported, that the maxilla was the most commonly affected site, followed by the mandible, and the lower lip (23). In another study by Ashkavandi et al., (2011), results showed that the parotid region and the palate were the most frequently affected sites in the extraoral and intraoral soft tissues (20). Regarding malignant lesions, a study by Okumu et al., (2012) revealed that the commonest sites were the orbit (46%) and maxilla (17%) (39); whereas Rwakatema et al., (2011) found that the most frequent locations were the lower lip (46.4%) and (35.7%) in the upper lip. The other sites included the tongue (10.7%) and the buccal mucosa (7.1%) (18).

1.2.2.4. Presenting signs and symptoms

Studies looking specifically at the clinical presentation of the tumours and tumour-like lesions in children were few (40). Nevertheless, most of these studies demonstrated that the main complaint was swelling in the maxillofacial area which may or may not be associated with pain (37). For malignant lesions, in addition to pain, other complaints varied according to location like paraesthesia was mainly due to pressure and obstruction (40). General symptoms included headache, anorexia, fever and weight loss (41,43). In general, the mean duration of the presenting symptoms ranged from 1 month to 36 months (41,44). Patients with epistaxis, ulceration, bleeding and dysaesthesia/paraesthesia were seen to present earlier than patients with pain and swelling. Patients with sarcomas were observed to attend earlier than those who had carcinomas and lymphomas (39). Paediatric jaw lesions can present in diverse clinical forms and their diagnoses can vary from odontogenic to non-odontogenic pathologies (7). The great majority of paediatric jaw tumours are non-odontogenic (43). Piloni et al., (2009) in a

review highlighted that the commonest clinical manifestations were slow and asymptomatic growth of the lesions, and the intraosseus tumours presented with the expansion of cortical plates (8). Tumours located in soft tissues presented with erythematous mucosa, very soft or friable consistency, and were sometimes ulcerated (8). In case of orbital involvement, the most frequent physical signs associated with the neoplasms were leucocoria (35%), proptosis (29%) and loss of vision (23%) (40,41). Other frequent signs were ulceration (17%), regional lymphadenopathy (14%) and tooth mobility (12%). The least common signs were discoloration, exposure keratitis (39).

1.2.2.5. Size of the lesions

The physical signs and symptoms of orofacial tumours and tumours-like lesions depend to a certain extent on the dimensions of the lesions. A small Intraosseous lesion is unlikely to be diagnosed on a routine examination of the mouth because signs will not be demonstrated. Such lesions are only likely to be detected at an early stage on routine radiographic examination (7). Coloma et al., (2011) in a study of oral haemangioma reported a mean diameter of the lesion to be 1.67 cm (range 1-3cm), and the duration ranged from 1 month to 5 years with a mean duration of 6.3 months (45). Piloni et al., (2009) reported a mean diameter of 2-5 cm in a study of malignant oral neoplasms (37). The size of the lesion is important also in staging of malignant tumours to determine the appropriate mode of treatment (46).

1.2.3. Histological types of lesions

Histological confirmation of the type of a tumour is an essential step in the accurate diagnosis and proper management of the lesion. Multiple studies reported on the histological types of lesions in children and the prevalence of these lesions differed according to geography or where the study was conducted. Sometimes within the same country differences were observed in particular regions or provinces. Two studies conducted in Tanzania on tumours of the maxillofacial region in children gave contradictory information. While Kalyanyama et al., (2002) reported malignant tumours as the most frequently encountered (17); Rwakatema et al., (2011) reported benign tumours to be seen with highest frequency (18). Both studies however, concurred that in the category of malignant neoplasms, Burkitt's lymphoma (BL) constituted

the most frequent malignant tumour accounting for 88.2% of all malignancies in the first study and 11.8% in the second study. This was followed by squamous cell carcinoma (4.4%) and oral Kaposi's sarcoma (2.9%). Fibroma, papilloma and haemangioma were the most frequent benign tumours and odontogenic cysts were the most frequent tumour-like lesions (47). On the other hand the most frequently diagnosed lesion of bacterial origin was tuberculous lymphadenitis (18). A study by Saravani et al., (2015) in Iran reported the order of frequency of the lesions that included inflammatory/reactive lesions (48.1%), cystic lesions (22.7%), neoplastic lesions (19.5%) (21). Similar findings were also reported by Wang et al., (2009) in Taiwan, though with some differences, that the most common oral lesions were inflammatory and reactive (45.5%), followed by neoplastic (23.5%) and other lesions (10).

In Saudi Arabia Al Yamani et al., (2011) reported that, of all the neoplasms in children, 75% were benign tumours and 25% were malignant. The percentages of odontogenic tumours and nonodontogenic tumours were 41.7% and 58.3% respectively (3). The most frequent odontogenic tumour was odontoma (4.5%), followed by ameloblastoma (3.2%). Giant cell granuloma (3.9%) was the most common benign nonodontogenic tumour. Among malignant neoplasms, lymphoma (3.9%) was the most frequent type of cancer, followed by fibrosarcoma (1.3%) and rhabdomyosarcoma (1.3%) (3). Meanwhile in India Chandrakar et al., (2015) in a study of cancer in children found that Hodgkin’s and non-Hodgkin’s lymphoma together constituted single largest group of tumours (36.2%) followed by retinoblastoma (30%), rhabdomyosarcoma (6.7%) and others (27.1%) (44-46).

Results of a study in South America by Goberlanio et al., (2014) showed that benign lesions accounted for 90.4% of the lesions, while 1.8% were malignant neoplasms (35). Among the benign lesions, 23% were of the salivary gland origin, while 18.8% had an epithelial origin and 17.4% were odontogenic lesions. The malignancies in children and adolescents found in this study consisted of squamous cell carcinoma, basal cell carcinoma and rhabdomyosarcoma (35). Lima et al., (2008) also reported predominance of salivary gland lesions and mucocele as the most common condition (89.2%) in this age category (23).

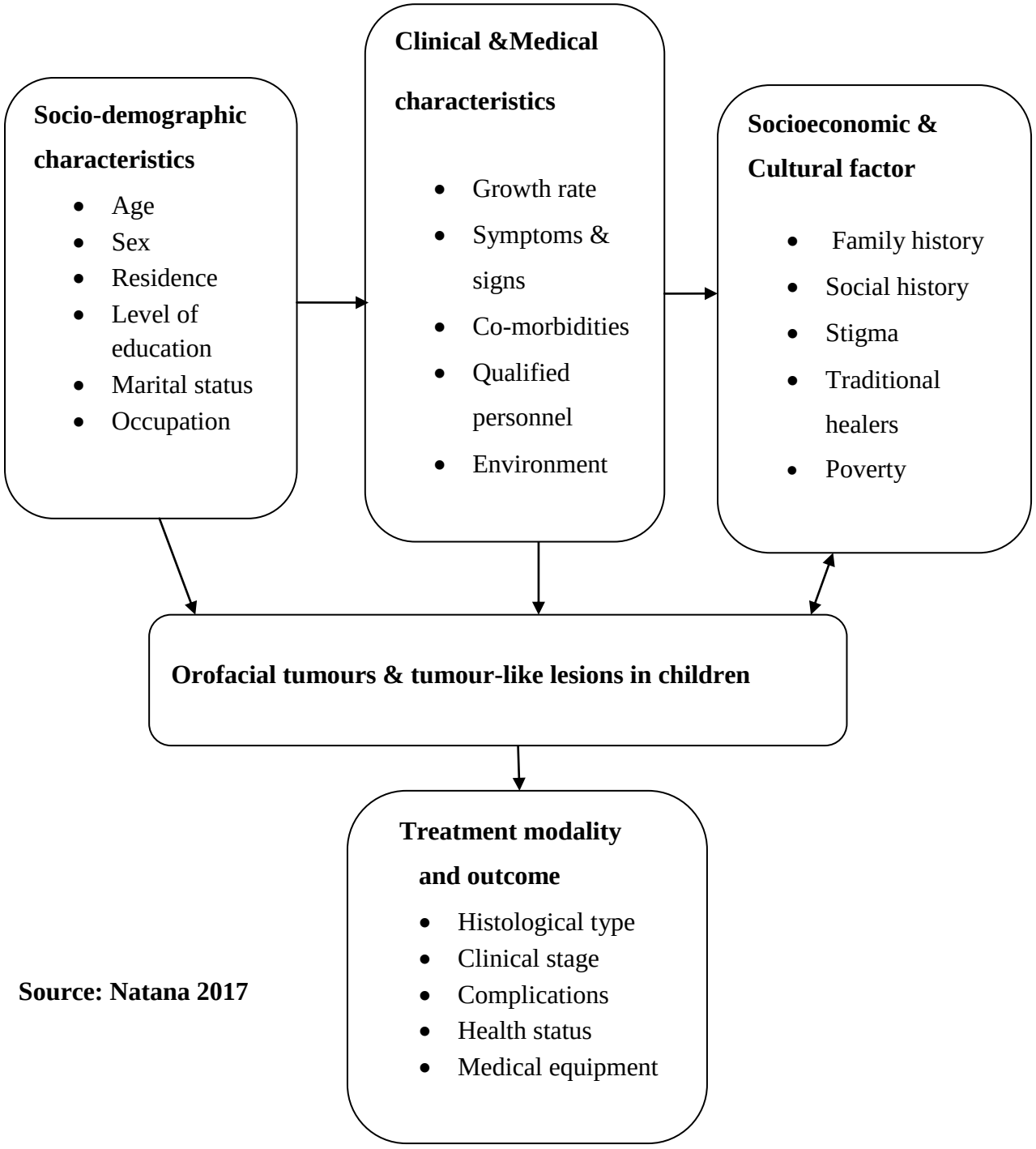
1.2.4. Treatment modalities of orofacial tumours & tumour-like lesions

Studies on the treatment of orofacial tumours and tumour-like lesions in children have shown that, the common mode of treatment is surgery for both benign and malignant lesions. Treatment of benign tumours consists of a range of surgical methods either conservative or radical; generally, surgical excision, curettage, and enucleation were adequate for their treatment. Coloma et al., (2011) studied orofacial vascular abnormalities and found that haemangiomas were removed surgically or by intralesional injections of sclerosing agents and embolization, and some disappeared spontaneously (45). Again, Coloma et al., (2011) in another study of cysts showed that removing the cyst with the entire capsule, by an intraoral approach suffices for large, deep seated non-infected lesions, obtaining good aesthetics and function. The extraoral approach was used in very large cysts affecting the submandibular and submental space, and in cases with infection that could compromise the patient's airway (49).

In cases of aggressive tumours like ameloblastoma which can spread to involve the surrounding structures radical resection was advocated. Some studies showed that patients who underwent radical resection could benefit from primary reconstruction by using reconstruction plates. After partial mandibulectomy the mandible could be reconstructed with reconstruction plate and iliac bone graft or costochondral graft (43). However, radical resection was subject to specific criteria such as age, clinical behavior and extent of the lesion (7).

On the other hand the management of malignant tumours can include, radical surgery alone or addition of either radiotherapy or chemotherapy or both, depending on the stage and extent of the disease (50). In late presentation and non-resectable tumours palliative care of the patient was the alternative mode of management. Generally, the growth and development of the jaws, esthetics and functional considerations in later periods of life must be taken care of when planning treatment for paediatric tumours (38,51).

1.3 Conceptual Framework



Source: Natana 2017

1.3.1 Explanation of the Conceptual Framework

- This conceptual framework describes the assumptions and questions raised in this research with its components such as the occurrence, clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children.

- The diagram shows how each of these variables, socio-demographic, clinical and medical characteristics of the patients including socioeconomic and cultural factors may be linked and how they could influence the presentation and the treatment of orofacial tumours and tumour-like lesions in children.

1.4 Problem Statement

Orofacial tumours and tumour-like lesions in children generally start as small swellings that progressively increase in size. Due to socioeconomic factors and lack of awareness patients often spend a lot of time at lower level healthcare centers without getting the appropriate treatment. Therefore, children with these lesions often presented late at the Oral and Maxillofacial Surgery department MNH with huge swellings that caused facial deformity and at times functional difficulties including feeding problems and even breathing difficulties and abnormal or delayed teething.

Surgical management at this late stage may have considerable risk of functional and cosmetic morbidity and a higher risk of mortality. Moreover, during treatment extra inputs would be required in terms of expertise and expensive operations. Hospital stay therefore would be longer with more days of absence from school for the children that would adversely affect their performance and even lead to the possibility of dropping out of school. The existing data on orofacial tumours and tumour-like lesions in children in Tanzania were scanty and the only two previous studies covered a period up to 2005. To date changes might have occurred in the data on these lesions. Therefore, there was a need to conduct this study to update the information regarding orofacial tumours and tumour-like lesions in children in Tanzania.

1.5 Rationale of the Study

This study investigated the occurrence and clinicopathological characteristics of orofacial tumours and tumour-like lesions and the modalities for their treatment in Tanzanian children. The results were compared to previous studies done in Tanzania and other parts of the world to assess the current profile of these lesions in this age group and appreciate any changes in epidemiological pattern. It was envisaged that data obtained from this study will aid the clinicians at the Oral & Maxillofacial Surgery department MNH and other healthcare institutions in early detection and appropriate management of children with these lesions. The updated data on the demographic, clinical and pathological features will provide invaluable source for comparison on further research on this topic. Moreover, the results can also be used by health authorities in the country in planning appropriate interventions to improve the health status of children in Tanzania. The study was also a requirement for partial fulfillment of Master of Dentistry Degree in Oral and Maxillofacial Surgery of the Muhimbili University of Health and Allied Sciences.

1.6 Research Questions

In this study the research questions were:

- How frequent are orofacial tumours and tumour-like lesions seen in Tanzanian children?
- What are the clinical and histopathological characteristics of orofacial tumours and tumour-like lesions in Tanzanian children?
- What are the treatment modalities used in the management of orofacial tumours and tumour-like lesions in Tanzanian children?

1.7 Objectives

1.7.1 Broad Objective

To determine the occurrence, clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children treated at Muhimbili National Hospital, Dar es Salaam, Tanzania.

1.7.2. Specific Objectives

1. To determine the demographic characteristics of children with orofacial tumours and tumour-like lesions treated at Muhimbili National Hospital.

2. To determine the clinical presentation of orofacial tumours and tumour-like lesions among children treated at Muhimbili National Hospital.

3. To determine the histopathological characteristics of orofacial tumours and tumour-like lesions among children treated at Muhimbili National Hospital.

4. To determine the treatment modalities of orofacial tumours and tumour-like lesions in children treated at Muhimbili National Hospital.

CHAPTER TWO

2.0 METHODOLOGY

2.1 Study setting

The study was conducted at the Oral and Maxillofacial Surgery and Otorhinolaryngology (ORL) departments at Muhimbili National Hospital, DSM, Tanzania which is the main tertiary and referral hospital in Tanzania that manages patients from different parts of Dar es Salaam and referral cases from other regions of Tanzania. The study included outpatients and inpatients.

2.2 Study design

This was a descriptive cross-sectional hospital-based study.

2.3 Study duration

The study was conducted for the duration of seven months from September 2016 to March 2017.

2.4 Study population

Participants in this study were all patients aged below 18 years with orofacial tumours and tumour-like lesions who attended the Oral and Maxillofacial Surgery and Otorhinolaryngology departments MNH for treatment during the study period.

2.5 Inclusion criteria and Exclusion criteria

2.5.1 Inclusion criteria

All patients aged below 18 years who attended for treatment at MNH and were histologically diagnosed with orofacial tumours and tumour-like lesions were included in the study after their parents/guardians had consented.

2.5.2 Exclusion criteria

- Children unaccompanied by parents/guardians.
- Mentally retarded children.
- Terminally ill children.
- Children/ parents who refused to participate in the study.
- Children with inconclusive biopsy results.

2.6 Sampling procedures

Convenience sampling method was used, whereby all patients less than 18 years old with orofacial tumours and tumour-like lesions who attended at the Oral and Maxillofacial and ORL departments MNH were examined and biopsied. Those who were histologically diagnosed with orofacial tumours and tumour-like lesions were recruited into the study after obtaining consent from their parents/guardians.

2.7 Data Collection Methods

An interview was conducted to all children and their parents/guardians using a structured questionnaire to obtain sociodemographic data, presenting symptoms and history of medical treatment received. Clinical examination and histological evaluation were done and the results were recorded in a special clinical form which was filled by the principal investigator. Treatment carried out and their immediate outcomes were also recorded in the clinical form.

2.7.1 Patients interview

The interviews were conducted in a secluded room within the department and responses of the participants were recorded in the questionnaire (Appendix III A and III B). The information about age, gender, symptoms, duration of the condition, medical history and prior treatment received for the condition were enquired.

2.7.2 Pre-testing the questionnaire

A pilot study was conducted for 15 patients at the DOPD for assessing the validity and reliability of the questionnaire. The questions were found to be clear and understood by the participants whose responses were similar when the questionnaire was re-administered.

2.7.3 Clinical examination

A thorough clinical examination of the patients was conducted by the principal investigator at the dental clinic with the patients seated on a dental chair under artificial light. In-patients were examined while on the examination bed under natural light. Examination findings were recorded in a special clinical form (Appendix IV).

2.7.4 Radiological evaluation

To show the location and extent of the lesions in the orofacial region plain radiographs, computed tomography scanning and ultrasonography were appropriately used.

2.7.5 Histological and cytological evaluation

This was the major method of confirming the diagnosis of the orofacial tumours and tumour-like lesions, whereby the histopathological diagnosis and the grade/subtype of the lesions were reported. It involved cytological or histological analysis of specimens. Cytological analysis was done through fine needle aspiration (FNAC); while tissue biopsy was done by the investigator either at the outpatient clinic under local anaesthesia with the patient seated on a dental chair or for smaller children under sedation or general anaesthesia in the main operating theatre. For small lesions excisional biopsy was done and in large lesions where excisional biopsy was not possible an incisional biopsy was performed. After taking biopsy, a specimen was immediately immersed in a bottle containing 10% formalin. The container was then labeled and the investigation form filled with the details of the clinical examination, clinical diagnosis, radiological report and the required test and thereafter sent to the laboratory.

The slides of both tissue and fine needle aspiration biopsy were examined and reported by experienced pathologists. Cytological results were at times supplemented by histological investigation.

2.8 Data handling and analysis

The collected data were recorded, counted and filtered for completeness and clarity. Statistical Package for Social Sciences (SPSS) software program version 20.0 was used to analyze the data. Cross-tabulation was done and the information obtained was processed using chi-square test to compare frequencies and proportions for possible associations. A P- value of less than 0.05 was considered statistically significant.

2.9 Study variables

2.9.1 Dependent variables

These were the clinical presentation, histopathological characteristics and treatment modalities.

2.9.2 Independent variables

These were the sociodemographic characteristics (age, sex, and residence, level of education, marital status and occupation).

2.10 Follow-up of patients

All patients were treated according to their conditions or diagnoses. Both forms of treatment modalities either surgical or non-surgical were used according to the particular diagnoses and disease stage. Patients with malignant tumours who required additional treatment were referred to Paediatric Oncology department and Ocean Road Cancer Institute either for chemotherapy, radiotherapy or chemo-radiotherapy. Few patients with extensive vascular disorders were referred to India for management of their conditions.

2.11 Ethical consideration

As the legal age for giving consent is above 18 years old, eligible children 15 years old and above and all parents/guardians were given explanation about the study before they were asked to give their consent to participate. Only those who gave consent were enrolled in the study. Those children aged less than 15 years their parents/guardians signed the consent on their behalf (Appendix I A and B; Appendix II A and B). Confidentiality was a priority during the data collection and analysis period. The assent and the informed consent forms were the only documents which carried the participants' names, study codes were used in the questionnaire and clinical assessment forms. Participants were assured that they were free to withdraw from the study whenever they felt so, and that the decision would not in any way affect their treatment plan in the departments of Oral and Maxillofacial Surgery and ORL MNH.

2.11.1 Ethical clearance

The proposal was presented in the department of Oral and Maxillofacial Surgery of the Muhimbili University of Health and Allied Sciences (MUHAS). Thereafter, ethical clearance was obtained from the Research and Publications Committee of the Muhimbili University of Health and Allied Sciences.

CHAPETR THREE

3.0 RESULTS

Between September 2016 and March 2017 a total of 578 patients, majority 314(54.3%) males with orofacial tumours and tumour-like lesions were treated at the Oral and Maxillofacial and ORL departments at MNH. Among these, 135(23.4%) were children, whereas 121(21%) of them had histological diagnosis of tumours and tumour-like lesions and were recruited in this study. Fourteen children were excluded from the study because they did not meet the inclusion criteria.

3.1 Demographic characteristics

The study consisted of 121 participants who included 63(52.1%) males with a male to female ratio of 1:0.9; and their age ranged from 4 days to 17 years old (mean= 8.6 years ± 5.5 SD). The age group 0-5 years was the most affected (38%) followed by the 11-15 years age group (28.1%) and 6-10 years age group (22.3%) (p=0.38). Children aged above 16 - < 18 years were the least affected in this study (Table 1).

Table 1: Distribution of children with orofacial tumours and tumour-like lesions according to age and sex

Age group	Sex				Total	
	Male		Female			
	n	(%)	n	(%)	N	(%)
0-5 years	19	(15.7%)	27	(22.3%)	46	(38%)
6-10 years	21	(17.4%)	6	(4.9%)	27	(22.3%)
11-15 years	16	(13.2%)	18	(14.9%)	34	(28.1%)
16-<18	7	(5.8%)	7	(5.8%)	14	(11.6%)
TOTAL	**63**	**(52.1%)**	**58**	**(47.9%)**	**121**	**(100%)**

Regarding the level of education, the majority (54.5%) of the study participants were at primary school level, followed by 12.4% who were at nursery school level and 10% at secondary school level. Among the group of 28(23.1%) study participants who had not started school, 26(92.9%) of them aged 0-5 years had not attained school age, while 2(7.1%) though had attained school age had not started schooling at the time of the study (Table 2). About 44.6% study participants lived in Dar es Salaam, whereas 35.6% came from upcountry rural areas and 19.8% from upcountry urban areas. Two of the participants referred from upcountry were found to be treated by cytotoxic drugs without biopsy.

Table 2: Distribution of children treated at MNH with orofacial tumours and tumour-like lesions according to age and educational level

Educational level	**Not started school**	**Nursery**	**Primary**	**Secondary**	**Grand Total**
Age group					**N (%)**
0 - 5 years	26	15	5	-	46 (38%)
6-10 years	1	-	26	-	27 (22.3%)
11–15 years	1	-	33	-	34 (28.1%)
16 -<18 years	-	-	2	12	14 (11.6%)
TOTAL	**28**	**15**	**66**	**12**	**121**
(%)	**(23.1%)**	**(12.4%)**	**(54.5%)**	**(10%)**	**(100%)**

3.2. Occurrence of orofacial tumours and tumour-like lesions in children

Majority (86%) of the orofacial tumours and tumour-like lesions encountered in this study were benign and a few (14%) were malignant with statistical significance of (p= 0.001). Among the benign lesions 63.4% were benign tumours and 36.6% tumour-like lesions. Haemangioma was the most common (25.7%) encountered benign tumour, followed by lymphangioma (21.6%) and ossifying fibroma (15.2%). Haemangioma involved all age groups and was most common in females than males; lymphangioma affected children aged 0-6 years old (Table 3).

Table 3: Distribution of benign orofacial tumours by age and sex among children treated at MNH

Histological type	**Age group**								**Total**	
	0 -5		6 - 10		11- 15		16 - <18		n	(%)
Sex	M	F	M	F	M	F	M	F		
Ameloblastic Fibroma	1	-	-	-	-	-	-	-	1	(1.5%)
Ameloblastoma	-	-	-	-	2	-	-	1	3	(4.6%)
Cystic Hygroma	1	1	-	-	-	-	-	-	2	(3%)
Desmoplastic fibroma	-	-	-	-	1	-	-	-	1	(1.5%)
Fibromatosis	-	-	1	-	-	-	-	-	1	(1.5%)
Fibroma	1	1	-	-	-	2	-	1	5	(7.6%)
Haemangioma	1	7	-	2	1	3	1	2	17	(25.7%)
Giant cell tumour	-	-	-	-	-	-	1	-	1	(1.5%)
Lipoma	-	1	-	-	-	-	-	-	1	(1.5%)
Lymphangioma	3	9	2	-	-	-	-	-	14	(21.3%)
Neuroectodermal tumour of infancy	1	2	-	-	-	-	-	-	3	(4.6%)
Neurofibroma	-	-	1	-	1	2	-	-	4	(6%)
Odontoma	-	-	2	-	-	-	-	-	2	(3%)
Ossifying Fibroma	1	-	2	-	4	2	1	-	10	(15.2%)
Schwannoma	-	1	-	-	-	-	-	-	1	(1.5 %)
Total	**9**	**22**	**8**	**2**	**9**	**9**	**3**	**4**	**66**	
(%)	**31(47)**		**10(15.1)**		**18(27.3)**		**7(10.6)**		**(100%)**	

Majority of the tumour-like lesions were found affecting females (63.2%) more than males (26.8%). Fibrous dysplasia was the most frequent (23.7%) tumour-like lesion encountered followed by dentigerous cyst (21%) and dermoid cyst in 13.1% of the participants. Fibrous dysplasia and dentigerous cyst were encountered in almost all age groups (Table 4).

Table 4: Distribution of orofacial tumour-like lesions by age and sex among children treated at MNH

Histological type	Age group								Total	
	0-5		6-10		11-15		16-<18		n	(%)
Sex	M-F		M- F		M- F		M- F			
Dentigerous cyst	1	1	-	2	1	2	1	-	8	(21%)
Dermoid cyst	3	-	-	-	-	1	1	-	5	(13.1%)
Cherubism	-	-	1	-	-	-	-	1	2	(5.4%)
Epulis	1	-	-	-	-	-	-	-	1	(2.6%)
Fibrous dysplasia	-	1	1	2	2	1	1	1	9	(23.7%)
Central giant cell granuloma	-	-	2	-	-	-	-	-	2	(5.4%)
Garre's osteomyelitis	1	-	-	-	-	-	-	-	1	(2.6%)
Focal epithelial hyperplasia	1	-	-	-	-	-	-	-	1	(2.6%)
Lymph node Keratin hyperplasia	-	-	-	-	1	-	-	-	1	(2.6%)
Peripheral giant cell granuloma	-	-	1	-	-	-	-	-	1	(2.6%)
Pyogenic granuloma	-	-	1	-	-	1	-	-	2	(5.4%)
Ranula	1	1	1	-	-	-	-	-	3	(7.8%)
Simple cyst	-	-	1	-	-	-	-	-	1	(2.6%)
Thyroglossal duct cyst	1	-	-	-	-	-	-	-	1	(2.6%)
TOTAL	**9**	**3**	**8**	**4**	**4**	**5**	**3**	**2**	**38**	
(%)	**12(31.6)**		**12(31.6)**		**9(23.7)**		**5(13.1)**			**(100%)**

Malignant lesions were observed mostly in males (64.7%) than females (35.3%) and children aged 6-16 years were the most (64.7%) affected. The most frequently observed malignant lesions were Burkitt's lymphoma and squamous cell carcinoma whereby each affected 23.5% of the study participants, followed by osteosarcoma and adenocarcinoma each encountered in 11.7% of study participants. The rest of the tumours were less often seen as each affected one study participant. Like Burkitt's lymphoma (BL), squamous cell carcinoma was another malignant tumour that was encountered in the youngest age (0-5) years (Table 5).

Table 5: Distribution of malignant orofacial tumours by age and sex among children treated at MNH

Histological type	**Age group**									**Total**	
	0-5		6-10		11- 15		16 - 18		n	(%)	
Sex	M – F		M - F		M - F		M - F				
Adenocarcinoma	-	-	1	-	-	-	-	1	2	(11.7%)	
Ameloblastic carcinoma	-	-	-	-	1	-	-	-	1	(5.9%)	
Burkitt's lymphoma	1	1	2	-	-	-	-	-	4	(23.5%)	
Chondrosarcoma	-	-	-	-	-	-	1	-	1	(5.9%)	
Diffuse large B-cell lymphoma	-	-	-	-	-	1	-	-	1	(5.9%)	
Mucoepidermoid carcinoma	-	-	-	1	-	-	-	-	1	(5.9%)	
Osteosarcoma	-	-	-	-	-	2	-	-	2	(11.7%)	
Rhabdomyosarcoma	-	-	-	-	1	-	-	-	1	(5.9%)	
Squamous cell carcinoma	1	-	1	-	1	1	-	-	4	(23.5%)	
Total	**2**	**1**	**4**	**1**	**3**	**4**	**1**	**1**	**17**		
(%)	**3(17.6)**		**5(29.4)**		**7(41.2)**		**2(11.8)**			**(100%)**	

3.3 Clinical presentation of orofacial tumours and tumour-like lesions in children

3.3.1 Duration of the lesion

The shortest duration of the lesions reported in this study was less than one month in 45.5% of the participants, followed by 1-3 months in 28.1% participants. A longer duration of 3-5 years was encountered in 4.1% of study participants, followed by that of more than 5 years and the longest duration was 15 years in one participant (p=0.001). The mean duration of the lesions was 3 months ±1.95 Standard deviation. The shortest duration for participants with benign lesions was 4 days for a participant with lymphangioma and the longest duration was 15 years for a participant with fibrous dysplasia. For malignant tumours the shortest duration was 2 weeks for a participant with Burkitt's lymphoma and the longest duration was 2 years for a chondrosarcoma participant.

3.3.2 Anatomical location

The most common site for the benign orofacial tumours in children in this study was the maxilla in 30% participants, followed by the submandibular region (26.9%), and the mandible in 25% participants. Haemangiomas were seen involving almost all anatomical sites in the orofacial region but the majority (13.4%) affected the lip, more on the upper lip than the lower lip; followed by the tongue, the gingiva, buccal mucosa and the cheeks. Majority (13.4%) of lymphangioma lesions were located in the submandibular region; followed by the floor of the mouth and the tongue (Table 6). Benign bone lesions like ameloblastoma were located more on the mandible than maxilla; ossifying fibroma was mostly located on the maxilla than the mandible.

Table 6: Distribution of benign orofacial tumours according to histological type and anatomical location in children treated at MNH

Histological Type	Man	Max	Gin	Pal	L	FOM	BM	T	SMR	PR	FR	TR	CH	OP
Amelo. Fibroma	1	1	-	-	-	-	-	-	1	-	-	-	-	-
Ameloblastoma	2	1	-	1	-	-	-	-	-	-	-	-	-	-
Cystic Hygroma	-	-	-	-	-	1	-	1	2	1	-	-	1	1
D. fibroma	1	-	1	-	-	-	-	-	1	-	-	-	-	-
Fibroma	3	1	3	-	-	-	1	-	-	-	-	-	-	-
Fibromatosis	1	-	-	-	-	-	-	-	1	1	-	-	-	-
Giant C.tumour	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Haemangioma	1	6	4	3	14	2	4	8	2	1	2	3	4	-
Lipoma	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Lymphangioma	-	-	-	-	-	6	1	5	14	2	-	-	2	-
NETI*	-	3	-	3	-	-	-	-	-	-	-	-	-	-
Neurofibroma	-	-	-	-	2	-	-	-	-	1	-	-	3	-
Odontoma	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Os. Fibroma	3	6	-	-	-	-	-	-	1	1	-	-	-	-
Schwannoma	-	-	-	-	-	-	-	-	-	-	1	-	-	-
TOTAL	**13**	**20**	**8**	**7**	**16**	**9**	**6**	**14**	**22**	**7**	**3**	**3**	**11**	**1**
(%)	**(19)**	**(30)**	**(12)**	**(10)**	**(24)**	**(14)**	**(9)**	**(21)**	**(33)**	**(11)**	**(4.5)**	**(4.5)**	**(17)**	**(1.5)**

Key: Man=Mandible; Max=Maxilla; Gin=Gingiva; Pal=Palate; L=Lip; FOM=Floor of mouth; BM=Buccal mucosa; T=Tongue; SMR=Submandibular region; PR=Parotid region; FR=Frontal region; TR=Temporal region; CH=Cheek, OP=Oropharyngeal region.

Amelo = Ameloblastic, D= Desmoplastic, C= cell, Os=ossifying, NETI* Neuroectodermal tumour of infancy.

The most common location for orofacial tumour-like lesions was the mandible in 34% participants, followed by the maxilla (31%). Fibrous dysplasia was seen involving the maxilla in 5.8% participants, followed by temporal bones (2.9%) and frontal bone (1.9%) (Table 7). The palate, Lips, cheeks and the oropharynx were not affected by orofacial tumour-like lesions.

Table 7: Distribution of orofacial tumour-like lesions according to histological type and anatomical location in children treated at MNH

Histological Type	Man	Max	Gin	FOM	BM	T	SMR	PR	FR	TR
CGCG	2	1	1	-	-	-	-	-	-	-
Cherubism	2	1	-	-	-	-	-	-	-	-
Dentigerous cyst	5	2	1	-	-	-	-	1	-	-
Dermoid cyst	-	-	-	4	-	2	5	-	-	-
Epulis	-	-	1	-	-	-	-	-	-	-
Fibrous Dysplasia	1	6	-	-	-	-	-	-	2	3
Garre's osteomyelitis	1	-	-	-	-	-	-	-	-	-
FEH	-	-	-	-	1	-	-	-	-	-
LNKH	-	-	-	-	-	-	1	-	-	-
PGCG	1	-	1	-	-	-	-	-	-	-
Pyogenic Gr.	-	2	2	-	-	-	-	-	-	-
Ranula	-	-	-	3	-	2	-	-	-	-
Simple cyst	1	-	1	-	-	-	-	-	-	-
Thyroglossal D.C.	-	-	-	-	-	-	1	-	-	-
TOTAL	**13**	**12**	**7**	**7**	**1**	**4**	**7**	**1**	**2**	**3**
(%)	**(34)**	**(31)**	**(18)**	**(18)**	**(2.6)**	**(11)**	**(18)**	**(2.6)**	**(5.2)**	**(7.9)**

Key: Man=Mandible; Max=Maxilla; Gin=Gingiva; Pal=Palate; L=Lip; FOM=Floor of mouth; BM=Buccal mucosa; T=Tongue; SMR=Submandibular region; PR=Parotid region; FR=Frontal region; TR=Temporal region; CH=Cheek, OP=Oropharyngeal region;CGCG=Central giant cell granuloma, FEH=Focal epithelial hyperplasia, LNKH=Lymph node Keratin Hyperplasia, PGCG= Peripheral giant cell granuloma,Gr=granuloma, D.C.=Duct cyst.

The mandible (47%) was the most commonly affected site by malignant lesions in the orofacial region, followed by the gingiva (41.1%), submandibular region (41.1%), and the cheek (23.5%). Burkitt's lymphoma which was the most frequent malignant lesion encountered was mostly located in the mandible. A single case among these was a synchronous involvement of both the mandible and maxilla. The malignant tumours of connective tissue the sarcomas, which included osteosarcoma, rhabdomyosarcoma and chondrosarcoma, were located on the mandible. The squamous cell carcinoma affected the lower lip, the tongue and the temporal region (Table 8).

Table 8: Distribution of malignant orofacial tumours according to histological type and anatomical location in children treated at MNH

Histological type	Man	Max	Gin	Pal	L	T	SMR	PR	FR	TR	CH
Adenocarcinoma	-	1	1	1	-	-	1	-	-	-	1
Amelo. Carcinoma	1	-	1	-	-	-	1	1	-	1	1
Burk. Lymphoma	3	1	2	1	-	-	1	-	-	-	2
Chondrosarcoma	1	-	-	-	-	-	-	-	-	-	-
D.L.B.C.L.	1	-	-	-	-	-	1	1	-	-	-
M. carcinoma	-	1	-	1	-	-	-	-	-	-	-
Osteosarcoma	2	-	2	-	-	-	2	-	-	-	-
Rhabdomyosarc.	1	-	1	-	-	-	1	1	-	-	-
SCC	-	-	-	-	3	1	-	-	1	1	-
TOTAL	**8**	**3**	**7**	**3**	**3**	**1**	**7**	**3**	**1**	**2**	**4**
(%)	**(47)**	**(17.6)**	**(42)**	**(17.6)**	**(17.6)**	**(5.9)**	**(41.1)**	**(18)**	**(5.9)**	**(11.7)**	**(23.5)**

Key: Man=Mandible; Max=Maxilla; Gin=Gingiva; Pal=Palate; L=Lip; FOM=Floor of mouth; BM=Buccal mucosa; T=Tongue; SMR=Submandibular region; PR=Parotid region; FR=Frontal region; TR=Temporal region; CH=Cheek, OP=Oropharyngeal region. Amleo.=Ameloblastic, Burk.= Burkitt's, D.L.B.C.L.= Diffuse large B cell lymphoma, M.=Mucoepidermoid, Rhabdomyosarc=Rhabdomyosarcoma, SCC=Squamous cell carcinoma.

3.3.3 Symptoms

The most common symptom encountered was itching that was reported by 13.2% of study participants with benign orofacial tumours and tumour-like lesions, followed by pain (8.6%) and numbness and parasthesia (7.7%). Toothache was reported by 6.7% study participants and 5.8% had constitutional symptoms of fever (Table 9). Itching was common in study participants who had lymphangioma, followed by dentigerous cyst and fibrous dysplasia.

Table 9: Distribution of benign orofacial tumours according to histological type and clinical characteristics in children treated at MNH

Histological type	SW	P	U	TA	LT	DT	B	DM	EP	NP	IT	DC	F
Ameloblastic Fibroma	1	-	-	-	-	-	-	-	-	-	-	-	-
Ameloblastoma	3	1	-	1	1	1	-	-	-	-	-	-	-
Cystic Hygroma	2	-	-	-	-	-	-	1	-	-	-	1	1
Desmoplastic fibroma	2	-	-	1	-	1	-	1	-	2	-	-	2
Fibromatosis	1	-	-	-	-	1	-	1	-	-	-	-	-
Fibroma	5	-	-	-	-	-	-	-	-	-	-	-	-
Giant cell tumour	1	-	-	-	-	-	-	-	-	-	-	-	-
Haemangioma	17	-	3	-	-	-	-	-	2	1	1	9	3
Lipoma	1	-	-	-	-	-	-	-	-	-	-	-	-
Lymphangioma	14	1	-	-	-	-	-	1	1	1	5	8	-
NETI	3	-	1	-	-	-	-	1	-	-	-	-	-
Neurofibroma	3	-	-	-	-	-	-	-	-	1	1	3	2
Odontoma	2	1	1	1	1	-	-	-	1	-	-	-	-
Ossifying Fibroma	10	1	-	-	-	4	2	2	1	1	2	-	-
Schwannoma	1	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**104**	**9**	**7**	**7**	**3**	**9**	**4**	**11**	**6**	**8**	**16**	**24**	**6**
(%)	**(100)**	**(8.6)**	**(6.7)**	**(6.7)**	**(2.9)**	**(8.6)**	**(3.8)**	**(10.6)**	**(5.8)**	**(7.7)**	**(15.4)**	**(23)**	**(5.8)**

Key: SW=Swelling; P=Pain; U=Ulcer; TA=; Toothache; LT=Loose teeth; DT=Displaced teeth; B=Bleeding; DMO=Difficult mouth opening; EP= Eye problems; NP=Numbness/Parasthesia; IT=Itching; DC=Discoloration; F=Fever, NETI=Neuroectodermal tumour of infancy.

In malignant tumours, pain and fever were the most frequent reported symptoms each by 47% study participants. These were followed by toothache in 47%, numbness/parasthesia and itching in 11.7% participants each (Table 11).

Table 10: Distribution of orofacial tumour-like lesions according to histological type and clinical characteristics in children treated at MNH

Histological type	SW	P	U	TA	LT	DT	B	DM	EP	NP	IT	DC	F
Central Giant cell Granuloma	2	-	-	1	1	-	-	1	-	-	-	-	-
Cherubism	2	-	-	-	-	-	-	-	-	-	-	-	-
Dentigerous cyst	9	2	2	1	-	-	-	-	-	1	4	-	-
Dermoid cyst	5	-	-	-	-	-	-	1	-	-	-	2	-
Epulis	1	-	-	-	-	-	-	-	-	-	-	-	-
Fibrous Dysplasia	9	1	-	1	-	3	-	2	1	1	3	-	-
Garre's osteomyelitis	1	1	-	1	-	-	-	-	-	-	-	-	-
Focal epithelial hyperplasia	1	-	-	-	-	-	-	-	-	-	-	-	-
LNKH	1	-	-	-	-	-	-	-	-	-	-	-	-
PGCG	1	-	-	-	-	-	1	1	-	-	-	1	1
Pyogenic Granumola	2	-	-	-	-	-	1	-	-	-	-	-	-
Ranula	3	-	-	-	-	-	-	-	-	-	-	-	-
Simple epithelial cyst	1	1	-	-	-	-	-	-	-	-	-	-	-
Thyroglossal duct cyst	1	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**38**	**5**	**2**	**4**	**1**	**3**	**2**	**5**	**1**	**2**	**7**	**3**	**1**
(%)	**(100)**	**(13)**	**(5)**	**(10)**	**(2.6)**	**(7.8)**	**(5)**	**(13)**	**(2.6)**	**(5)**	**(18.4)**	**(7.8)**	**(2.6)**

Key: SW=Swelling; P=Pain; U=Ulcer; TA=; Toothache; LT=Loose teeth; DT=Displaced teeth; B=Bleeding; DMO=Difficult mouth opening; EP= Eye problems; NP=Numbness/Parasthesia; IT=Itching; DC=Discoloration; F=Fever; LNKH=Lymph node keratin hyperplasia.

3.3.4. Signs

All the participants with benign orofacial tumours and tumour-like lesions in this study presented with swellings in the orofacial region (100%), followed by discoloration of the skin or mucosa (26%), difficult mouth opening (10.6%), and displaced teeth in 8.6% and ulceration in 6.7% participants (Table 10). Discoloration was a common feature of haemangioma lesions, and was seen in 8.6% participants, followed by lymphangioma (7.7%) participants. In some 11.4% participants swelling was the only presenting sign of the tumours and tumour-like lesions. Malignant lesions presented with swelling as the commonest clinical sign in all 100% participants, followed by ulceration in 64.7%, bleeding in 47%, difficult mouth opening in 41.1% and loose teeth in 41.1% study participants (Table 11).

Table 11: Distribution of malignant orofacial tumours according to histological type and clinical characteristics in children treated at MNH

Histological Type	SW	P	U	TA	LT	DT	B	DMO	EP	NP	IT	DC	F
Adenocarcinoma	2	1	1	-	-	-	-	-	-	-	-	-	-
Amelo. Carcinoma	1	-	-	-	1	1	1	1	1	1	-	-	-
Burkitt's Lymphom	4	2	3	2	3	3	2	2	1	-	-	-	4
Chondrosarcoma	1	1	1	-	1	1	1	1	-	-	-	-	1
DLBCL	1	-	-	-	-	-	-	-	-	-	-	-	-
M. carcinoma	1	-	1	-	-	-	-	-	-	-	1	-	-
Osteosarcoma	2	2	-	-	1	-	2	2	-	-	-	-	2
Rhabdomyosarcoma	1	1	1	1	1	1	1	1	1	1	-	-	1
SCC	4	1	4	-	-	-	1	-	3	-	1	4	-
TOTAL	**17**	**8**	**11**	**3**	**7**	**6**	**8**	**7**	**6**	**2**	**2**	**4**	**8**
(%)	**(100)**	**(47)**	**(64)**	**(18)**	**(41)**	**(35.2)**	**(47)**	**(41)**	**(35.2)**	**(11.7)**	**(11.7)**	**(23.5)**	**(47)**

Key: SW=Swelling; P=Pain; U=Ulcer; TA=; Toothache; LT=Loose teeth; DT=Displaced teeth; B=Bleeding; DMO=Difficult mouth opening; EP= Eye problems; NP=Numbness/Parasthesia; IT=Itching; DC=Discoloration; F=Fever.

3.3.5 Diameter of the lesion

The most frequently encountered diameter of benign orofacial tumours and tumour-like lesions was 6-10 cms in 28.1% participants, followed by 3-6 cms diameter in 21.5% participants. The greatest diameter of benign orofacial tumours was above 15 cms in 15.7% participants with a mean diameter of 2.92 cms and Standard deviation ±1.25 cms. In malignant tumours the most frequent diameter observed was > 15 cms in 41% of study participants, followed by 3-6 cms in 23.5% participants with a mean diameter of 3.39 and Standard deviation ±1.61 cms.

3.4 Treatment modalities of orofacial tumours & tumour-like lesions

The most common treatment modality used in benign tumours was surgery, whereby majority (53%) of the participants were treated by conservative surgical excision of the lesions which included enblock resection and enucleation with a statistically significant difference compared to other modalities (p=0.001). Radical surgical resection was used in 6% of the participants who had ameloblastoma. The second management modality was referral of 20(30.3%) participants abroad. Other treatment modalities employed included sclerosing agent in 6% participants, observation in 4.5% participants who had fibrous dysplasia and ranula (Table 12).

Table 12: Distribution of children with benign orofacial tumours according to histological types and treatment modalities used at MNH

Histological Type	Ob	SA	CSE	Maxi	Mandi	R&R econ	RF
Ameloblastic fibroma	-	-	1	-	-	-	-
Ameloblastoma	-	-	-	1	2	-	-
Cystic Hygroma	-	-	1	-	-	-	1
Desmoplastic fibroma	-	-	1	-	-	-	-
Fibroma	-	-	5	-	-	-	-
Fibromatosis	-	-	1	-	-	-	-
Giant cell tumour	-	-	1	-	-	-	-
Haemangioma	-	4	4	-	1	1	8
Lipoma	-	-	1	-	-	-	-
Lymphangioma	-	-	4	-	-	-	10
NETI*	-	-	3	-	-	-	-
Neurofibroma	3	-	-	-	-	-	1
Odontoma	-	-	2	-	-	-	-
Ossifying fibroma	-	-	10	-	-	-	-
Schwannoma	-	-	1	-	-	-	-
TOTAL (%)	**3 (4.5)**	**4(6)**	**35(53)**	**1(1.5)**	**3(4.5)**	**1(1.5)**	**20(30)**

Key: Ob=Observation; SA= Sclerosing agent; CSE=Conservative surgical Excision; Maxi=Maxillectomy; Mandi=Mandibulectomy; R&Recon=surgical resection &Reconstruction; RF=Referral, *NETI: Neuroectodermal tumour of infancy.

The commonest treatment modality of orofacial tumour-like lesions was conservative surgical excision in form of enucleation and/or curettage and remodeling. Observation was used in 18.4% participants and Chemical cauterization in 2.6% participants (Table 13).

Table 13: Distribution of children with orofacial tumour-like lesions according to histological type and treatment modalities used at MNH

Histological Type	Ob	CC	CSE
Central giant cell granuloma	-	-	2
Cherubism	-	-	2
Dentigerous cyst	-	-	8
Dermoid cyst	-	-	5
Epulis	-	-	1
Fibrous dysplasia	3	-	6
Garre's osteomyelitis	-	-	1
Focal epithelial hyperplasia	-	1	-
Lymph node keratin hyperplasia	1	-	-
Peripheral giant cell granuloma	-	-	1
Pyogenic granuloma	-	-	2
Ranula	3	-	-
Simple cyst	-	-	1
Thyroglossal duct cyst	-	-	1
TOTAL (%)	**7 (18.4)**	**1(2.6)**	**30 (79)**

Key: Ob=Observation; CC= Chemical cauterization; CSE=Conservative surgical excision.

Wide surgical excision of the tumours was the most common treatment modality that was done in 76.4% participants with malignant lesions ($p = 0.001$), followed by chemotherapy in 47% participants and radiotherapy in 17.6% participants as adjunct therapy following surgery (Table 14).

Table 14: Distribution of children with malignant orofacial tumours according to histological type and treatment modalities used at MNH

Histological type	WE	Mandi	CT	RT
Adenocarcinoma	2	-	-	-
Ameloblastic carcinoma	-	1	-	1
Burkitt's Lymphoma	-	-	4	-
Chondrosarcoma	-	1	-	-
Diffuse large B-cell lymphoma	-	-	1	-
Mucoepidermoid carcinoma	1	-	-	-
Osteosarcoma	-	2	2	-
Rhabdomyosarcoma	1	1	1	1
Squamous cell carcinoma	4	-	-	1
TOTAL (%)	**8(47)**	**5(29.4)**	**8(47)**	**3(17.6)**

Key: WE=Wide Excision; Mandi=Mandibulectomy; CT= Chemotherapy; RT= Radiotherapy.

CHAPTER FOUR

4.0 DISCUSSION

This cross-sectional study evaluated data on the occurrence, clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children aged 0 - 18 years who attended the oral and maxillofacial surgery (OMFS) and Otorhinolaryngology (ORL) departments at MNH Tanzania. Patients from different parts of the country are referred to this tertiary hospital for treatment; therefore, the findings and conclusion from this study could be a reflection of the nation-wide pattern.

4.1 Socio-demographic characteristics of children with orofacial tumours and tumour-like lesions

Children constituted 23.4% of all the patients with orofacial tumours and tumour-like lesions who attended treatment at MNH during the period of this study Table 1. This was in agreement with other studies done in Africa (30), although some of them reported higher prevalence of these lesions in children (31,33). In this study the lesions were more frequently diagnosed in males than females. The difference could be due to either trauma because of physical activity in males or hormonal factors. A study by Okumu et al., (2011) in Kenya also reported a higher preponderance of males compared to females (39). Other reports however, indicated females predominance over males (35,54).

This study showed a trend of increased frequency in two peaks, one in the 0-5 years and the other in 11-15 years age group. A previous study (18) in a Tanzanian child population reported different findings where tumours were observed more in the 6-15 years than 0-5 years age groups which was almost similar to reports in other studies (10,55). Differing scenarios exist where some studies have reported a decreased occurrence of the tumours with increased age of the children (35,38) while others indicated an increased prevalence of tumours with increased age of the children (52). These findings show the importance of another study to investigate the changes in occurrence of the lesions at these specific ages.

This study revealed that 44.6% of participants lived in Dar es Salaam city and its peripheries, which implied that they had access to the available oral and maxillofacial care. For those study participants from the upcountry rural areas, majority (83.4%) of them reported a distance of less than 5 kilometers from their residence to the nearest health facility. It can easily be emphasized that both DSM and upcountry residents had an equitable access for health services. The long duration of the tumours and tumour-like lesions reflected the time wasted and the delay caused in some situations due to misdiagnosis and wrong treatment mostly in form of antibiotics and analgesics when the lesions were initially considered infections. In two participants chemotherapy was used empirically, the lesions after biopsy were found to be neuroectodermal tumour of infancy and fibrous dysplasia which didn't require such a treatment.

4.2 Frequency of orofacial tumours and tumour-like lesions in children

Most studies on orofacial tumours and tumour-like lesions in children have shown that benign lesions are more common compared to malignant lesions (3,20,37). Likewise, in this study the benign lesions affected the majority 86% of the study participants while malignant tumours were encountered in 14% of the study participants. This finding was in agreement with the last study done in northern Tanzania on orofacial tumours in children (18), but contradicted the findings of another study done at MNH which reported that malignant tumours were the most common lesions in that age group (34). However, the differences could be due to the changes in the treatment protocol of BL in the country and the time of the year the study was conducted when BL's occurrence was not at its peak. Benign lesions in this study occurred nearly in all age groups and presented almost evenly distributed in males and females and tended to decrease with increasing age of the children. On the other hand malignant lesions had predilection for males than females and had a higher distribution in the 6-15 years age group; findings which were similar to what has been reported in another study (37).

Haemangioma was the most common benign orofacial tumour encountered in virtually all age groups from 0-18 years, with a predilection for females than males. Further, results showed that of all the children with haemangioma, about 29% had congenital haemangioma while the rest had acquired haemangioma. Similar findings have been reported in another study (54). Haemangioma are painless and therefore they could be neglected, remain untreated and increase in size as the children grew. That could be the reason why in a cross-sectional study like this one all age groups were found affected. Similar findings have been reported in other studies (3,21,56,57).

The second most common benign tumour was lymphangioma, which unlike haemangioma was found affecting children aged between 0-10 years only. However, like haemangioma it predominated in females, with a female to male ratio of 2:1. The frequency of these lesions in this study was similar to what was reported by Qanam et al., (2015), but considerably higher than that reported before by other studies (20,34). These differences could be attributed to the study design, variation in the time the studies were done and increased awareness by the patients. The frequency of vascular disorders encountered in this study could be inferred to give the actual picture of maxillofacial vascular disorders in the Tanzanian population because most children with these lesions in the orofacial region were referred from all over the country to this institution for evaluation, management and follow-up. The sizable number of children affected with these vascular disorders calls for comprehensive study in order to assess their magnitude in the population and lay out plans for possible management locally.

Fibrosseus lesions were the third, fairly common benign tumours encountered and these included ossifying fibroma and fibrous dysplasia. There was clear predominance of males in ossifying fibroma but no sex predilection was observed in fibrous dysplasia and both tumours occurred mostly in children above 5 years of age. This was in conformity with the findings in other studies (3,21). Fibrous dysplasia which is common in children was reported to be influenced by hormonal changes that is why their management is mostly deferred until after puberty unless they cause severe deformity and interfere with function. Other fibrosseus

lesions in this study included central giant cell granuloma and cherubism which occurred in few participants (Table 3 & 4).

Fibroma which was another common benign tumour found in children in this study, it occurred in all age groups and was predominant in females more than males with a female to male ratio of 4:1 (Table 3). However, in one study (17) this tumour was reported to be the most common benign tumour that occurred in similar age groups. Another study in Brazil reported that these tumours occurred in older children but were more frequent in males than females (56). Fibroma could be caused by poor oral hygiene, chronic irritation, parafunctional habits and hormonal fluctuations hence the need for orientation on proper oral hygiene habits for those at risk (35,59).

Odontogenic tumours which included three benign lesions ameloblastoma, ameloblastic fibroma and odontoma and one malignant lesion ameloblastic carcinoma were encountered only in 9.1% of study participants. Although, Ajayi et al., (2004) in Nigeria reported a higher frequency of 19.3% their findings were in agreement with this study that these lesions occurred predominantly in males above the age of 5 years and were mostly located on the mandible (57).

Cysts were the most common tumour-like lesions encountered in this study; these cysts were all developmental in origin (Table 4). This was in conformity with findings in one study which reported that in paediatric patients developmental cysts were more common than inflammatory cysts (58). The commonest cyst encountered in this study was the dentigerous cyst and it was common in the mixed dentition period 5-16 years. This frequency was slightly similar to what have been reported in some studies (23,30), but lower in others (11,49,62-65). Most dentigerous cysts occur in adults and older children due to the quiescent epithelial remnants after teeth eruption but in the two participants in this study who were aged 5 years old the cysts had involved the premolar buds. This could be explained by the fact that these were of the inflammatory type of dentigerous cyst which could have developed following the decay of the primary dentition. The periapical inflammation in the primary predecessors could have

affected the permanent dentition follicles leading to the formation of the cysts (63,66). The dermoid cyst that was also frequently encountered in this study was a benign soft tissue lesion that affected more males than females at the male to female ratio of 4: 1, occurring in all age groups from 0-18 years. Another study reported the common age to be 0-5 years (49). Since dermoid cysts are probably caused by the entrapment of epithelium or stem cells they could occur congenitally or later in life.

Malignant orofacial tumours affected 14% of the children and were seen in all age groups. In this study Burkitt's lymphoma was one of the two most common malignant tumours observed that affected participants aged 0-10 years (Table 5). Almost similar findings have been reported in another study indicating that BL occurred in all age groups but mostly in those aged 5-12 years (17). Most studies in Africa have suggested that the high prevalence of malignant orofacial tumours observed could be due to the occurrence of BL which is endemic in Africa (67,68). However, these results were contrary to studies in other continents where these malignant lesions were reported to be rare in the young children (11,37,48,50,69).

The other most common malignant lesion was squamous cell carcinoma. As in several studies orofacial squamous cell carcinoma is primarily a disease that affects males aged 60 years and above, and it is uncommon in paediatric patients and especially in the very young (70,71). In this study the squamous cell carcinoma affected almost all age groups except those aged above 16 years, at a male to female ratio of 2:1. This finding appeared to be contrary to that in another study (68). The known risk factors for squamous cell carcinoma in adults which include smoking, high consumption of alcohol, chewing of betel and chronic irritation are not relevant in children (73,74). Therefore, in paediatric patients genetic predisposition, viral infections and immunosuppression have been postulated to be the more likely risk factors (71,74). In the current study squamous cell carcinoma that was encountered could have been due to xeroderma pigmentosa and albinism which the patients had. These are hereditary autosomal recessive disorders that are characterized by changes in the skin pigmentation, extreme sensitivity to ultraviolet rays in sunlight that cause sunburn and skin cancers (75-77).

The conditions are commonly associated with paediatric squamous cell carcinoma (29,72,75,77).

The next most common malignant tumours which equally shared the third place were sarcomas and malignant salivary gland tumours. Sarcomas had a varied histological diagnosis including osteosarcoma, rhabdomyosarcoma and chondrosarcoma. These were more relatively seen in the older children compared to the carcinomas; the age of occurrence ranged between 11-<18 years. While osteosarcoma was exclusively found in females, the other variants were mainly in males. In other studies on osteosarcoma, Gannon et al., (2001) observed no gender differences but Elarabi et al., (2009) found that the tumours occurred in males more than females and mostly in younger children (14,43). In this study the malignant salivary gland tumours were seen in females more than males and the age of participants affected ranged between 6-18 years. The most common tumour in this group was adenocarcinoma followed by mucoepidermoid carcinoma (Table 6). These findings were contrary to other studies which reported that mucoepidermoid carcinoma was the most common malignant salivary gland tumour in children (78,79). However, due to the small number of these tumours in this study such an inference could still be credible.

4.3 Clinical characteristics of orofacial tumours and tumour-like lesions in children

4.3.1. Anatomical location

The common anatomical site of occurrence of benign tumours varied in most studies due to the heterogeneity of these lesions. Comparison between the results would therefore not reflect the differences in distribution of these lesions in soft or hard tissues. Nevertheless, in this study the most common site for the benign orofacial tumours and tumour-like lesions in children was the maxilla, followed by the submandibular region and the mandible (Table 6&7). However, Rwakatema et al., (2011) reported that the mandible was the most affected site, followed by maxilla (18). Other studies from different countries concluded that the mandible was the common affected site (11,45,60,61). Regarding individual benign lesions in this study, the most common tumour haemangioma had a propensity for the lips; the upper one

being most affected than the lower lip. This was similar to what has been reported in another study (45). However, contrary to these findings, the gingiva and palate have been reported to be the most affected locations by most benign tumours in the Persian population (21).

Unlike their counterparts, malignant tumours most commonly affected the mandible which was similar to a report by Ajayi et al., (2007) (38). The gingiva and submandibular region were found equally affected by malignant lesions probably due to infiltration of the adjacent tissues by the rapidly growing tumours (Table 8). The only case of rhabdomyosarcoma in this study involved both hard and soft tissues, extending from the masseter muscle, mandible, gingiva, submandibular region, parotid region up-to the base of the skull. However, a study by Andrade et al., (2010) reported that the buccal mucosa and the tongue were the commonly affected sites by rhabdomyosarcoma (75). Burkitt's lymphoma which was the commonest malignant tumour in this study exclusively involved the mandible. A single case among these was a synchronous involvement of both the mandible and maxilla. Furthermore, in three participants with squamous cell carcinoma the tumours were located on the lower lip and tongue, similar to what have been reported in other studies (72,73). In the fourth participant the lesion was located on the temporal region. Due to delay in seeking treatment in some participants, the tumours had attained large sizes and involved several anatomical sites, thereby; complicating the management and having poor outcome in terms of aesthetics and function.

4.3.2. Symptoms

The major clinical symptom presented by the study participants with benign orofacial tumours and tumour-like lesions in this study was itching of the skin over the area of swelling (Table 9&10). Looking at the lesions reported to be accompanied by itching as a result of swelling, it could have been due to neuropathic itch which was thought to arise from central or peripheral nerve damage, compression or irritation caused by a lesion or disease (76) (Table 10). Pain was reported by 8.6% participants mainly those with cystic lesions. Since most benign lesions are painless, such finding could be due to infection that could have set in or nerve compression by the expanding tumour.

Pain and fever were the most frequent symptoms encountered in malignant tumours (Table 11). Osteosarcoma and Burkitt's lymphoma were typically characterized by variable painful episodes, likewise patients with these two tumours experienced increased body temperature, as similarly reported by Gannon et al., (2001) (41). Majority of malignant tumours are painless but at an advanced stage they could be painful due to nerve involvement but also when they get infected following ulceration that is common in these lesions. Numbness or paraesthesia at a certain area of orofacial region was another common symptom in malignant tumours; this symptom could have resulted from the infiltration of the nerves by the tumour cells involving mostly the inferior alveolar and the infraorbital nerves.

4.3.3. Signs

The key clinical sign in this study was swelling in the orofacial region; similar to what have been reported in other studies (44,80). All the study participants presented with this finding though the sizes varied (Table 9, 10 &11). The most frequent size of the lesions was 6-10 cms in the greatest diameters, similar to what has been reported by Andrade et al., (2010). Ulceration was a common feature which was seen in 64.7% participants with malignant lesions, this has been reported in several other studies (41,71,81).

While bleeding was observed in 45% participants with malignant tumours it was only seen in 3.8% of the study participants with benign lesions. Bleeding a common feature of malignant lesions is usually due to infiltration and erosion of the blood vessels by the tumour cells. Furthermore, difficult mouth opening was observed in 41.1% participants with malignant tumours and 10.6% in those with benign tumours, while loose teeth was encountered in 41.1% and 2.9% participants with malignant and benign tumours respectively. The difficulty in mouth opening could have resulted from obliteration of the oral cavity by the tumours or in case of malignant tumours was due to the infiltration of the muscles that open and close the mouth, thereby affecting their function. While loosening of the teeth occurs due to the destruction of the alveolar bone around the teeth roots by the growing tumours.

Participants with orofacial tumours presented also with eye problems like tearing, proptosis and diplopia in 41.1% participants with malignant tumours and 5.8% participants with benign lesions. Tearing could have resulted from the blockage of the lacrimal apparatus by tumours located at the area of the medial canthus of the eye. Proptosis could be due to infiltration by the tumour and expansion into the orbital cavity that could lead to pushing of the eyeball anteriorly. Moreover, diplopia could have been caused by destruction of the inferior orbital wall by the tumours that eventually led to lowering of the globe on the affected side and consequently double vision of objects by the eyes. Since some clinical features were shared by both benign and malignant lesions, the clinicians must have a high diagnostic index for suspected nodules on the oral mucosa and initiate proper and timely measures for their management (24).

4.4. Treatment modalities of orofacial tumours and tumour-like lesions in children

The mainstay of treatment of orofacial tumours and tumour-like lesions in this study was surgery (Table 12, 13 &14). The biological behaviour and clinical extent of the lesion guided the selection of the appropriate technique and approach for a particular tumour (6,82,83). When planning for surgery preservation of the growth potential of the child was taken into consideration in order to improve the outcome of surgery. Majority of the study participants were conservatively managed by surgical excision, curettage, remodeling and enucleation. Depending on the histological type of the lesion each of the above surgical technique was applied.

Although, ameloblastoma is a benign lesion, it is locally aggressive and has a high recurrence rate (83,84). Based on this fact radical resection was the method used for most of the patients with ameloblastoma. The clinical extent of the lesion determines the choice of either radical resection or conservative excision in form of enucleation with application of chemical cauterization using Carnoy's solution plus observation. In this study, due to the large sizes of the tumours aggressive surgical approach including partial maxillectomy was done in one participant with ameloblastoma of the right side of maxilla and partial mandibulectomy was

done in other two participants with ameloblastoma of the mandible and hemi-mandibulectomy in another participant, no reconstruction was done in these patients. The other case of partial mandibulectomy was a 14 years old female with central haemangioma on the left side of the mandible extending from the body of the mandible to the subcondylar region. The patient initially presented to our department and was enrolled in the study but the relatives sent her abroad for treatment where primary resection in form of partial mandibulectomy was done followed by reconstruction of the mandible four months later using fibular bone graft from the right leg. The patient was doing well and attending regular follow-up at our institution.

As it could be deduced from the above cases, economic factors played a major role in the type of treatment a patient received. Considering the age of the patients ideally all patients who underwent mandibulectomies deserved reconstruction to preserve the shape and function of the jaws. Although the oral and maxillofacial department was technically equipped to do such operations, due to the lack of reconstruction plates which were too expensive for many to afford, the patients ended up with resection only. Apparently, the long term effects of these debilitating surgeries on the quality of life will have to be assessed in the future. A previous study by Simon et al., (2005) on quality of life after treatment of adult patients with ameloblastoma in Tanzania concluded that the patients were invariably affected (81). A participant with ameloblastic fibroma of the mandible reflected yet another important aspect of surgical management in children. The participant had sickle cell disease, although the treatment of the tumour was enucleation, patients with sickle cell disease need special precautions like adequate hydration and pre-oxygenation to avoid damage on organs especially during intubation when oxygen tension becomes low.

About (4.5%) study participants with neurofibroma were put on observation and follow-up and they were advised to report to the hospital whenever they noticed any abnormal signs or symptoms. All the neurofibroma cases encountered in this study were of the plexiform type, one of the participants had been referred abroad before for treatment where surgical excision was done, but the lesion recurred again to a larger size. Although, neurofibroma is benign its diffuse local spread and involvement of tissues and high rate of recurrence renders curative

management difficult to achieve in patients who are diagnosed with the tumour. One of the participants with a moderate size tumour was waiting for the process of being transferred abroad for surgical treatment.

A group of (30.3%) study participants were referred abroad for treatment; these patients had vascular disorders and presented with extensive tumours involving multiple locations that required management in a specialized centre with technical expertise and advanced equipment which were not available at our institution. One participant with lymphangioma of the submandibular region who was a 2 years old female was considered for referral abroad, the parents couldn't comply with the follow-up schedule because they were residing in a rural area. The tumour became too big to the extent of causing airway obstruction when they reported to the hospital; emergency tracheostomy had to be performed and when the patient was taken for surgery to excise the tumour she succumbed to death due to cardiac arrest. Several factors could have contributed to the unfortunate death in this case, some of which could have been avoided like lack of awareness by the parents, early referral or surgery if adequate equipment were available.

About 3% study participants with haemangioma were treated by sclerosing agents prior to surgery (Table 12). The use of sclerotherapy is a common method for treatment of haemangioma in several studies (54). The other reported treatment methods included observation, surgery, laser therapy, cryosurgery and pharmacological using different medications e.g. corticosteroids (82). The commonest sclerosing agents used at our setting were 70% ethanol and 30% sodium chloride. Two patients with haemangioma of the lip were initially started on 30% sodium chloride, but the lip mucosa and skin underwent ulceration and became infected. The treatment had to be changed after resolution of the wound to 70% ethanol alcohol which yielded better results and the patients underwent surgery.

Another 3% of the participants with haemangioma of the lip and tongue were given Propranolol. Propranolol is a non-selective Beta-blocker which is increasingly being used in the treatment of proliferating haemangioma in newborns and infants (56). The effectiveness

of this novel medication is yet to be ascertained at our centre since one of the two candidates who had been on Propranolol disappeared from follow-up, the other one showed slight reduction in the size of the lesion. Two participants with haemangiomas who were treated surgically, had recurrences of the tumour after few months from treatment. One of these had haemangioma of the upper lip which was surgically excised after injections with sclerosing agent 70% ethanol, and the other had haemangioma of the cheek who after recurrence was referred abroad and underwent surgery after embolization. These two patients were currently under observation and monthly follow-up.

The commonest modality of treatment of tumour-like lesions was surgery whereby majority of the participants underwent conservative surgical excision (Table 13). Enucleation was the method used for treatment of dentigerous cysts while remodeling was done in participants with fibrous dysplasia and cherubism. Although most literature on cherubism reported that it was advisable to wait until after puberty when growth has ceased and the tumours would regress. The decision for surgery in this study was justified by the facial deformity and psychological discomfort the participant had. Other conservative surgical techniques like curettage, en block excision were used according to histological types of the tumours.

Two participants with ranula one of whom was a 7 years old male sero-converted by HIV due to mother to child transmission (MTCT) had swellings on the floor of the mouth. The participant with Human Immunodeficiency Virus (HIV) was managed as ordinarily as other participants while following the usual infection control measures. After confirmation of the lesion by Fine needle aspiration cytology during follow-up of treatment the lesion bursted, in the other participant the lesion also bursted while the third one had a small ranula and the patients were all put on observation. Chemical cauterization was used as a treatment modality in one participants who was a 5 years old male with focal epithelial hyperplasia that is a contagious disease caused by human papilloma virus (83); Sodium nitrate stick was used on selected group from the multiple mucosal nodular swellings in each visit, on follow-up the nodules disappeared after each application.

For malignant tumours the commonest treatment modality used in this study was surgery (Table 14), which was similar to other studies (43,83). Wide surgical tumour excision with curative intent was used with the aim of achieving a disease free margin. Total mandibulectomy was done in patients with osteosarcoma, ameloblastic carcinoma and chondrosarcoma each with a single participant; the participant with chondrosarcoma died during the operation due to cardiac arrest resulting from anaesthetic complications. This participant was a 17 years old male who had chondrosarcoma which had involved the whole mandible; the patient also had multiple bone deformities kyphosis and scoliosis. The cases of mortality in this study underscored the importance of early referral and proper provisions for management of children with orofacial tumours.

Furthermore, partial mandibulectomy was done in a participant with osteosarcoma and another one with rhabdomyosarcoma. The histological type and grade of the tumour and subsequent report of the status of the margins in addition to the stage of the disease were the factors that determined the need of a patient to undergo postoperative adjuvant therapy (77).

All the Participants with malignant salivary gland tumours and three participants who had squamous cell carcinoma were treated by wide surgical excision as a sole treatment modality with a disease free margin that obviated the need for radiotherapy. Other studies reported that radiotherapy could have a negative impact on the growth and development of the facial structures and increase the chances of a second malignancy in children (48,71). These participants were put on close and regular follow-up and were advised to report immediately to the hospital whenever they noted any suspicious signs and symptoms. The fourth participant with squamous cell carcinoma underwent wide surgical excision of the tumour and adjuvant radiotherapy.

Postoperative chemotherapy was used in two participants one of them had osteosarcoma and the other rhabdomyosarcoma. Chemotherapy as an exclusive treatment modality was used in 29.4% participants whereby four participants had BL and one participant had diffuse large B-cell lymphoma. There was dramatic reduction in the sizes of the BL tumours after initiation of

treatment and after completion of the cycles of chemotherapy the participants had regained their normal facial contours and were well on follow-up. The participant with diffuse large B-cell lymphoma had lost her hair after completion of treatment but was well and on regular follow-up.

Three study participants were treated by postoperative radiotherapy, among them was a participant aged 12 years old with squamous cell carcinoma who underwent wide tumour excision followed by adjuvant radiotherapy. A participant with rhabdomyosarcoma aged 12 years and another with ameloblastic carcinoma aged 14 years were treated by wide surgical excision that was followed by adjuvant radiotherapy due to the advanced grade and clinical stage of these malignancies. The latter patient underwent a second surgery for residual tumour in the infratemporal fossa and three months after the end of treatment there was no sign of recurrence on control CT scan.

CHAPTER FIVE

5.0 CONCLUSIONS

- Orofacial tumours and tumour-like lesions in this study were relatively common in children.
- Delay and late reporting for treatment was noted in many children with orofacial tumours and tumour-like lesions.
- Benign orofacial lesions are more common than malignant tumours in children in this study.
- Due to overlapping of clinical presentation between benign and malignant lesions, clinicians must establish histological diagnosis of every tumour before initiating definitive treatment.
- Surgery was the main treatment modality of orofacial tumours and tumour-like lesions.

5.1 Recommendations

- Formulate educational programmes to raise public awareness on orofacial tumours and tumour-like lesions and the importance of early reporting of any lesion in the orofacial region.
- Continuous professional education to health cadres especially those working in peripheral hospitals to help in early detection and referral of patients with orofacial tumours.
- Establishment of a specialized centre in the hospital for treatment of vascular disorders.
- Conduct another study on orofacial tumours and tumour-like lesions to determine the predisposing factors and outcome of treatment of these tumours and their effects on the quality of life of the children.

5.2 Dissemination of Results

The findings of this study were presented as a dissertation in partial fulfillment of Master of Dentistry degree of Muhimbili University of Health and Allied Sciences, and will be presented as abstract in scientific seminars/conferences and scientific reports (manuscripts) submitted to an appropriate journal. A copy will be submitted to the Ministry of Health and Social welfare United Republic of Tanzania as the main stakeholder and authority on Health in the country.

5.3 Study Limitations

- Due to the short duration of the study adequate follow-up of the patients was not possible for further evaluation.

- This is a single hospital–based study; patients with orofacial tumours who were managed in other hospitals were not represented.

- The study was conducted in two departments within the hospital and therefore children with orofacial tumours attending the other departments could not be included due to time and resource constraints.

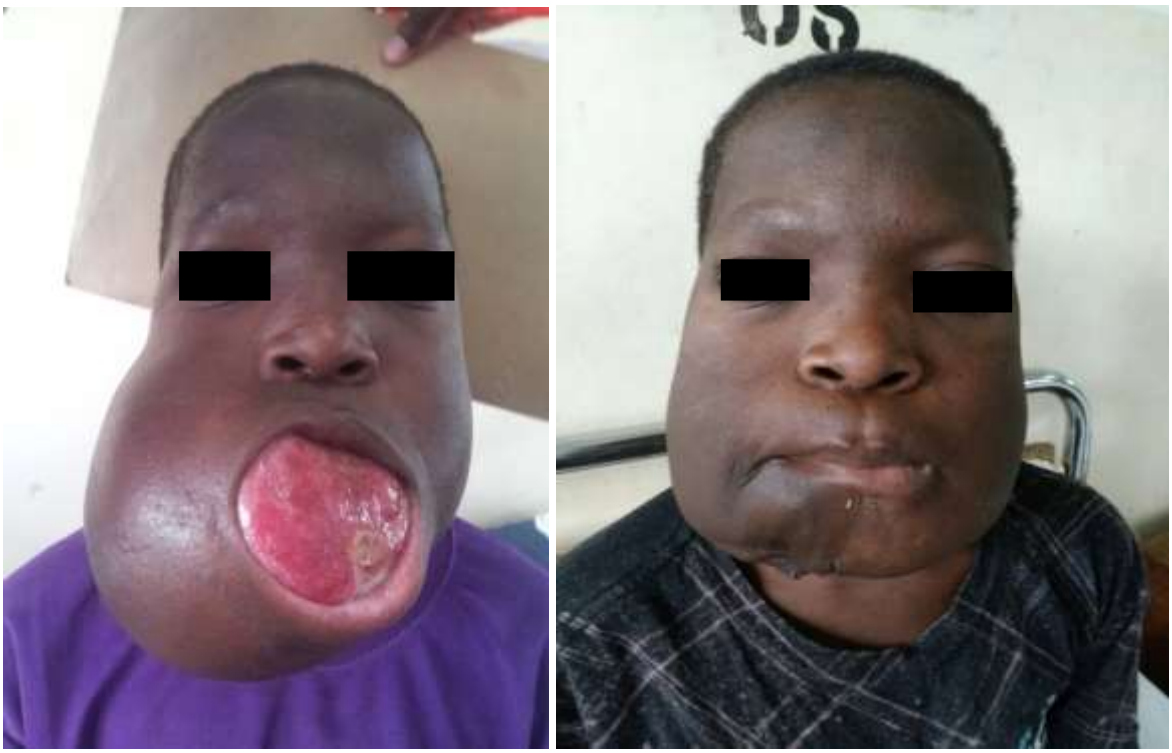


Figure 1: Photograph of a 14 years old male with Central giant cell granuloma of the mandible before and two weeks after tumour enucleation and curettage (Photos by Dr Natana 2017).

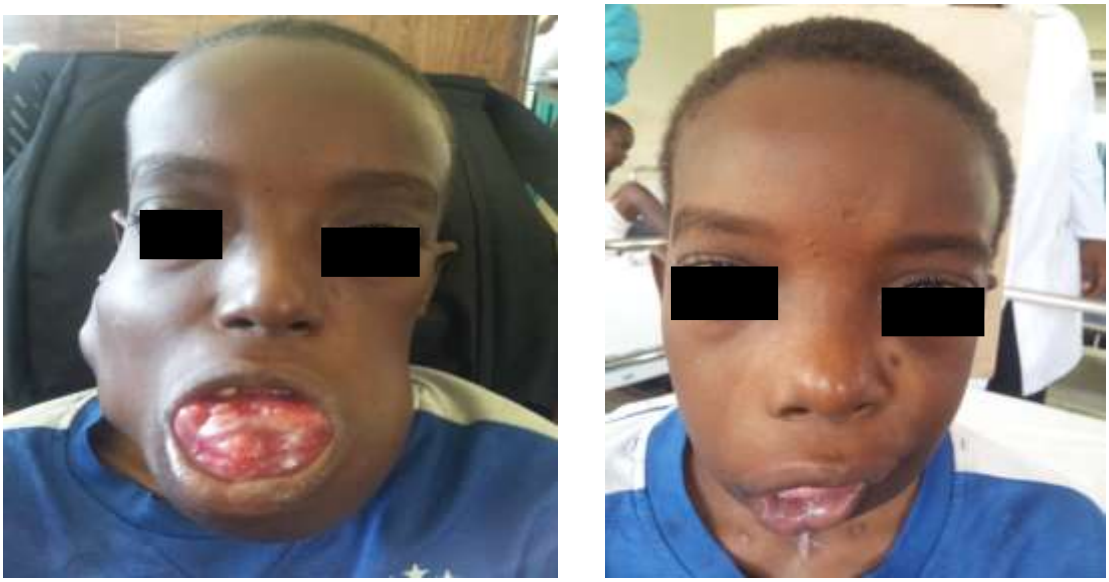


Figure 2: Photographs of a 14 years old male with Ameloblastic carcinoma of the mandible before and one month after total mandibulectomy (Photos by Dr Natana 2016).

Figure 3: Photograph of an 11 years old female with Osteosarcoma of the mandible before and one month after total mandibulectomy (Photos by Dr Natana 2017).

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APPENDICES

Appendix IA: Assent – English Version

Assent form for children

Greetings; I am Dr Gift Gibson Natana, a postgraduate student. I am doing a research which is a way to learn more about swellings on the mouth and face of children who come for treatment at Muhimbili National Hospital.

I am asking you to help because we want to know more about the swellings in children.

If you agree to be in our study, we are going to ask you some questions about yourself and how the condition started and what you feel because of this swelling and what has been done since it started.

You can ask questions about this study at any time. If you decide at any time not to finish, you can ask us to stop.

If you sign this paper, it means that you have read this and that you want to be in the study. If you don't want to be in the study, don't sign this paper. Being in the study is up to you, and no one will be upset if you don't sign this paper or if you change your mind later.

Child's name:……Date…….

Child's signature:……..…….....

Name of investigator: ……...Date …….

Signature of investigator: …….

Appendix I B: Assent – Swahili Version

Fomu ya ridhaa kwa watoto

Mimi naitwa Gift Gibson Natana ni dactari wa shahada ya kwanza, lakini, kwa sasa nimwanafunzi wa shahada ya pili yau dactari bingwa wa kinywa na meno,na fanya utafiti wa uvimbe sehemu za kinywa na uso kwa watoto walio kuja kwa matibabu hospitali ya Taifa ya Muhimbili.

Naomba ushirikiano wako kwani tunahitaji kujua Zaidi kuhusu matatizo ya uvimbe kwa watoto.

Endapo utakubali kushiriki utaulizwa maswali kwenye dodoso ya takayo kuhusu wewe mgonjwa, jinsi ugonjwa ulivyoanza na uvimbe unakupa matatizo gani na umepata matibabu gani toka uvimbe umeanza.

Una ruhusiwa kuuliza maswali yahusuyo dodoso hii pia unaweza

Kujiondoa bila masharti yeyote kama hutapenda kuulizwa maswali yaliyopo kwenye dodoso.

Endapo uta saini dodoso hili inamaana umesoma na kuelewa na utashiriki kwenye utafiti huu, na kama hutapenda kuwa mshiriki kwenye utafiti huu usisaini dodoso hili, na pia kuwepo kwenye utafiti huu hulazimishwi, nihiari yako.

Jina la mtoto:……Tarehe…….

Sahihi ya mleziwa mtoto:……..…….....

Jina la msahili: ……...Tarehe …….

Sahihi ya msahili: …….

Appendix II A: Consent Form – English Version

Parent/Guardian consent form

Permission to participate in the study

Greetings; I am Dr Gift Gibson Natana, a postgraduate student. I am doing a research on orofacial tumours and tumour-like lesions in children attending for treatment at the Oral & Maxillofacial Surgery & Otorhinolaryngology departments at Muhimbili National Hospital. Your child has been invited to join in this research study.

Purpose of the study

To determine the occurrence, clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children treated at Muhimbili National Hospital.

What participation involves

If you accept your child to take part in the study a questionnaire will be given and the child will be required to answer some questions which have been prepared for the research.

Confidentiality

Your child's name will not be used when data from this study are handled. Every effort will be made to keep clinical records, research records, and other personal information confidential.

Risk

There is no harm expected to happen to your child for taking part in this study.

Rights to withdraw

Participating in this study is completely voluntary, refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which your child is entitled.

Benefits

The results of this study will help the doctors at the Oral & Maxillofacial Surgery & Otorhinolaryngology departments MNH and other health institutions in early detection and appropriate management of children with these kind of lesions that will improve outcome of treatment and prevent complications to other patients with similar conditions in future.

Who to contact

If you have any questions concerning the study you can contact me the principal investigator Dr Gift Gibson Natana MUHAS P.O BOX 65001 Dar es salam Tanzania Tel no. 0687734083 or the supervisors of this study Dr B.M. Kalyanyama Tel no. 0754496986 and Dr E.N. Simon Tel no. 0784718235. If you have any questions concerning your rights as a participant you may contact Prof. F. Aboud Chairperson of the college Research and publication committee P.O. BOX 65001 Dar es Salaam Tanzania Tel No.2150302-6.

Permission for a Child to Participate in Research

As parent or legal guardian, I authorize …….(Child's name) to become a participant in the research study described in this form.

Parent or Legal Guardian's name……..……..

Parent or Legal Guardian's Signature…….. Date…….

Signature of investigator……Date……

Kiambatanisho : II B

Appendix IIB: Consent Form – Swahili Version

Fomu ya ridhaa kwa mzazi

Mimi naitwa Gift Gibson Natana ni dactari wa shahada ya kwanza lakini kwa sasa ni mwanafunzi wa shahada ya pili yau dactari bingwa wa kinywa na meno, nafanya utafiti wa uvimbe sehemu za kinywa na uso kwa watoto walio kuja kwa matibabu hospitali ya Taifa ya Muhimbili, tunaomba mwanao ashiriki kwenye utafiti huu.

Lengo la utafiti huu

Ni kujua ukubwa watatizo la uvimbe na matibabu yake kwa watoto wanao pata matibabu ya uvimbe kwenye kinywa na sura katika hospitali ya Taifa Muhimbili.

Ushiriki wako

Endapo utakubali mwanao kuwa mshiriki kwenye utafiti huu utapewa dodoso na mwanao ataombwa kujibu maswali yaliyopo kwenye dodoso.

Usiri

Jina la mwanao halitatumika endapo taarifa mbalimbali zitachukuliwa, taarifa zote zitakuwa ni siri. Hakuna madhara yoyote yatatokea kwa mtoto endapo atakubali kushiriki kwenye utafiti huu**.**

Haki yakujitoa

Ushiriki kwenye utafiti huu ni hiari, unaruhusiwa kujiondoa muda wowote bila mashariti haku na adhabu wala hasara yeyote kwa mzazi au mtoto.

Faida

Matokeo ya utafiti huu utasaidia madactari bingwa kitengo cha kinywa na meno pia na madactari wa masikio koo na pua katika hospitali ya Taifa Muhimbili na taasisi nyingine za

afya kuwakugundua mapema na kuwahi matatibabu ya uvimbe kwa watoto wadogo na kuleta matokeo mazuri ya matibabu pia kuzuia matatizo ya aina hayo yasijitokeza.

Mawasiliano

Fomu hii ya maelezo ya kushiriki pamoja na dodoso vinaweza kuwa na maelezo yasiyoeleweka Vizuri kwako, usisite kuniuliza mimi unaweza kuwasiliana na mi, Dr Gift Gibson Natana MUHAS S.L.P 65001 Dar es salaam Tanzania simu ya mkononi 0687734083 au wasiliana na msimamizi wangu Dr B.M. Kalyanyama simu ya mkononi 0754496986 na Dr E.N. Simon simu ya mkononi 0784718235 pia kama utakuwa na maswali kama mshiriki unaweza wasiliana na mwenye kiti kamati ya utafiti Prof. F. Aboud S.L.P 65001 Dar es Salaam Tanzania simu nukshi .2150302-6.

Ruhusa ya mtoto kushiriki kwenye utafiti

Kama mzazi au mlezi na mruhusu……..(jina la mtoto)
Jina la mzazi au mlezi……..

Sahihi ya mzazi au mlezi…….Tarehe…….

Sahihi ya msahili……Tarehe…….

Appendix III A: Questionnaire – English Version

1. Serial no: ……. 3. Hospital Reg. no: ……..……..

2. Date: …….. 4. Telephone number: …….

5. Address: Ward/Division…….…….District……...Region…….

Socio-demographic data

1. Age: Exact age in: 1.Years…… ☐

2. Months……. ☐

3. Days…… ☐

2. Gender……. ☐

1. Male
2. Female

3. Marital status…… ☐

1. Not applicable
2. Single
3. Married

4. Level of education…… ☐

1. Not school age
2. No formal education
3. Nursery
4. Primary
5. Secondary
6. College

5. Occupation…….. ☐

1. Not applicable

2. Pupil/Student

3. Employed (Specify……..)

4. Completed Standard seven, idle at home

5. Peasant

6. Others,(specify……..)

6. Residence……. ☐

1. Dar urban

2. Dar peripheral areas

3. Upcountry urban

4. Upcountry rural

- What is your main complaint?

7. Swelling 1.Yes 2.No ☐

8. Pain 1.Yes 2.No ☐

9. Swelling with pain 1.Yes 2.No ☐

10. Ulceration 1.Yes 2.No ☐

11. Toothache 1.Yes 2.No ☐

12. Loose teeth 1.Yes 2.No ☐

13. Displaced teeth 1.Yes 2.No

14. Bleeding from the mouth 1.Yes 2.No

15. Bleeding from the nose 1.Yes 2.No

16. Difficulty in mouth opening 1.Yes 2.No

17. Nasal blockade 1.Yes 2.No

18. Eye problems 1.Yes 2.No

19. Facial deformity 1.Yes 2.No

20. Numbness/parasthesia 1.Yes 2.No

21. If yes in No.18 above, what kind of eye problem?.....

1. Protrusion
2. Tearing
3. Discharge
4. Poor/blurred vision
5. Double vision
6. Can't see

22. When did you first notice the problem?.....

1. 2 weeks
2. 1-2 months
3. 3month -6months
4. 6months-1 year
5. 1year-3 years
6. 3year-5years
7. More than 5 years, specify …….

23. Who first alerted you to the presence of this condition?..... ☐

1. Self

2. Parents

3. Friends

4. Doctor/Dentist

5. Spouse (wife/husband)

6. Others, specify…….

24. How did the condition start?..... ☐

1. I was born with it

2. Painless Swelling

3. Painful swelling

4. Painless ulcer

5. Painful ulcer

6. Mobility of teeth

7. Bleeding

8. Pain (in the area involved)

9. Pigmentation

10. Numbness/parasthesia (lip, lower jaw, dentition)

25. How can you rate the growth of the tumour?.....

1. Rapidly growing

2. Slowly growing

3. Static

4. Regressing

5. As I grow up it increases in size also

26. When did you first seek medical attention after noticing this condition?...

1. Less than 1 month

2. 1-3 months

3. 3-6months

4.6months- 1 year

5. 1 year -3 years

6. 3 years -5 years

7. More than 5 years,(specify……)

27. Where did you first go to seek treatment for this condition?.....

1. I consulted a traditional healer

2. Dispensary (primary health care centre)

3. District hospital

4. Regional referral hospital

5. Consultant (specialist) hospital

28. Who attended to you at the health facility you reported to in No. 26?..... ☐

1. Traditional healer

2. Clinical officer/Assistant

3. Nurse

4. Assistant medical officer

5. Dental therapist

6. Medical officer

7. Dentist

8. Oral & maxillofacial surgeon

29. What type of investigation was done in No.27?..... ☐

1. No investigation was done

2. Hemoglobin

3. X-ray of the head

4. Aspirated the lesion for investigation

5. A piece of tissue was taken for investigation

6. CT scan was done

30. What kind of treatment did you receive for the condition?..... ☐

1. Observation
2. Herbal medicines
3. Drugs (Antibiotics & pain killers)
4. Surgery-biopsy
5. Surgery- tumour excision was done
6. I was referred to a regional hospital
7. I was referred to a consultant hospital
8. Others, specify……

31. What caused you to delay in seeking medical attention?..... ☐

1. I thought it would resolve on its own
2. There was no body to take me to hospital
3. I had financial problems
4. Fear of treatment
5. No health facility where I live
6. I was on follow-up of treatment

32. How far is the nearest health facility from your residence?..... ☐

1. Less than 5KM
2. 5-10KM
3. 10-20KM
4. >20KM

33. With whom are you living? …….. ☐

1. Parents
2. Guardian
3. Friends
4. Relatives, (specify relationship…….)
5. Orphanage home
6. No specific place/streets

34. Do you have any other medical condition?..... ☐

1. Diabetes
2. Hypertension
3. Tuberculosis
4. HIV
5. Malignancy (not head & neck)

6. Sickle cell disease

7. Blood disorders, specify……..

8. Others, specify……

35. Is there any member of your family with the same condition?..... ☐

1. Yes

2. No

If yes, for how long…….

36. Have you been treated before for the same condition?..... ☐

1. Yes

2. No

Appendix IIIB: Questionnaire – Swahili Version

Dodoso

1. Namba ya dodoso: …….,,,,,, 3. Namba ya hospitali: ……..……..

2. Tarehe: …….. 4. Namba ya Simu: …….

5. Anuani: Kata……. …….. Wilaya……...Mkoa…….

Socio-demographic data

1. Umri: 1.Miaka…… ☐

2. Miezi……. ☐

3. Siku…… ☐

2. Jinsia…… ☐

1. Mme

2. Mke

3. Hali ya ndoa…… ☐

1. Haihusiki

2. Sijaoa/sijaolewa

3. Nimeoa/Sijaolewa

4. Kiwango cha elimu…… ☐

1. Hajaanza shule

2. Shule ya awali

3. Shule ya msingi

4. Shule ya sekondari

5. Elimu ya juu

5. Kazi…… ☐

1. Haihusiki(bado mtoto mdogo)

2. Mwanafunzi

3. Mfanyakazi

4. Amemaliza shule ya msingi, anasubiri nyumbani

5. Mkulima

6. Zinginezo (Taja…….)

6. Makazi……. ☐

1. Dar mjini

2. Dar pepembezoni mwa mji

3. Mkoani,mjini

4.Mkoani,vijijini

7-Sababu kuu ya kuja hospitali?

7. Uvimbe 1.Ndiyo 2.Hapana ☐

8.Maumivu 1.Ndiyo 2.Hapana ☐

9. Uvimbe na Maumivu 1.Ndiyo 2.Hapana

10. Kidonda 1.Ndiyo 2.Hapana

11Jino kuuma 1.Ndiyo 2.Hapana

12Meno kulegea 1.Ndiyo 2.Hapana

13. Meno kusukumwa 1.Ndiyo 2.Hapana

14. Kutokwa na damu mdomoni 1.Ndiyo 2.Hapana

15.Kutokwa na damu puani 1.Ndiyo 2.Hapana

16. Kushindwa kuachama 1.Ndiyo 2.Hapana

17. Pua kuziba 1.Ndiyo 2.Hapana

18. Matatizo ya macho 1.Ndiyo 2.Hapana

19. Sura kuharibika 1.Ndiyo 2.Hapana

20. Ganzia 1.Ndiyo 2.Hapana

21. Kama umejibu namba 18juu,tatizio lilikuwa?.....

1. Jicho kutokeza nje

2. Kutokwa Machozi

3. Kutoa usaha/damu/majimaji n.k

4. Kutokuona vizuri

5. Kuona kitu viwiliviwili

6. Siwezi kuona

22. Ni lini mwanzo uligundua tatizo hili?..... ☐

1. Wiki 2

2. Mwezi 1-miezi2

3. Miezi 3 – miezi 6

4. Miezi 6 – mwaka 1

5. Mwaka 1-miaka3

6.Miaka 3- miaka 5

7. Zaidi ya miaka 5, taja…….

23. Nani aligundua tatizo hilo kwako mwanzoni?..... ☐

1. Mwenyewe

2. Mama/Baba/ndugu zangu

3. Marafiki

4. Daktari/daktari wa meno

5. Mme/mke

6. Zingineyo ,Taja…….

24. Tatizo lilianzaje?..... ☐

1. Nilizaliwa nacho

2. Uvimbe usiouma

3. Uvimbe unaouma

4. Kidonda kisichouma

5. Kidonda kinachouma

6. Meno kulegea

7. Kutokwa na damu

8. Maumivu (eneo husika)

9. Kubadilika rangi

10. Ganzi (mdomo, taya la chini, meno)

25. Je kasi ya kukua uvimbe ikoje?..... ☐

1. Haraka

2. Taratibu

3. Hauongezeki

4. Unapungua

5. Unakua ninavyokua

26. Ulipita muda gani kutafuta matibabu baada ya kugundua tatizo lako?.. ☐

1. Chini ya mwezi 1

2.Mwezi 1-miezi 3

3. Miezi 3-miezi 5

4. Miezi 6- mwaka 1

5. Mwaka 1- miaka 3

6. Miaka 3–miaka 5

7. Zaidi ya miaka 5,(taja……)

27. Awaali ya yote ulienda wapi kutafuta matibabu?.....

1. Kwa mganga wakienyeji

2. Zahanati

3. Hospitali ya wilaya

4. Hospitali ya mkoa

5. Hospitali ya rufaa

28. Ulikoenda kwamatibabu mara ya kwanza,je ni nani aliyekuhudumia?..

1. Mganga wakienyeji

2. Mhudumu wa afya(nesi)

3. Mganga

4. Daktari mzaidizi

5. Mganga ya meno

6. Daktari

7.Daktari ya meno

8. Oral & maxillofacial surgeon Daktari bingwa wa Matayana uso

29. Ulifanyiwa vipimo gani?..... ☐

1. Sikufanyiwa chochote

2. Kinango cha damu maslini(Hb)

3. X-ray ya kichwa

4. Walichukua kipimo cha sindano

5. Walichukua kinyama kwa ajiliya vipimo

30. Ulipewamatibabu gani?..... ☐

1. Nililazwa Uangalizi

2. Dawa za kienyeji

3. Vidonge(Antibiotics & vya maumivu)

4. Upasuaji mdogo-kinyama kuchukuliwa

5. Upasuaji mkubwa- uvimbe kuondolewa

6. Nilipewa barua ya rufaa kwenda hospitali ya mkoa

7. Nilipewa barua ya rufaa kwenda hospitali ya rufaa

8. Mengineyo,taja……

31. Sababu ya kuchelewa kutafuta huduma?..... ☐

1. Nilidhani litaisha lenyewe
2. Hakukuwepo namtu wakunipeleka hospitali
3. Matatizo ya kifedha
4. Niliogopa matibabu
5. Hakukuwa na huduma za afya karibu
6. Nilipewa tarehe ya kurudi kwa uangalizi

32. Je, huduma za afya zikoumbali gani toka uishipo?..... [ ]

1. Chini ya KM 5
2. KM 5-10
3. KM 10-20
4. >KM 20

33. Je,unaishi na nani nyumbani? ……. [ ]

1. Wazazi
2. Mlezi
3. Rafiki
4. Ndugu, (taja uhusiano…….)
5. Vituo vya watoto yatima
6. Mitaani

34. Je,unatatizo lolote lingu ine la kiafya?..... ☐

1. Kisukari

2.Presha ya kupanda

3. Kifua kikuu

4.VVU/UKIMWI

5. Saratani (siyo ya mataya)

6. Ugonjwa wa Selimundu (Sickle cell disease)

7. Matatizo ya damu, taja……..

8. Mengineyo, taja……

35. Je,kuna jamaa au ndugu wakaribu mwenye tatizo kama lakwako?..... ☐

1. Ndiyo

2. Hapana

Kama ndiyo, je kwa muda gani ?…….

36. Je ulishawahi kutibiwa kwa ugonjwa huu?..... ☐

1. Ndiyo 2. Hapana

Appendix IV: Clinical Assessment Form

36.Vital signs: BP:…….PR……..RR……..Temperature……

37. Provisional clinical diagnosis…….

38. Clinical presentation of the lesion…… ☐

1. Swelling

2. Diffuse swelling

3. Ulceration

4. Swelling &Ulceration

5. Fungating

6. Hyperplasia/reactive

Extra-oral examination

39. Facial deformity 1. yes 2.no ☐

40. Lymph node involvement 1. yes 2. no ☐

41. Underlying structures fixity 1. yes 2. no ☐

42. Overlying skin fixity 1. yes 2. No ☐

43. Overlying skin features…… ☐

1. Normal

2. Increased temperature

3. Ulcerated

4. Colour changed

5. Ulcerated and colour changed

6. Increased temperature, ulcerated and colour changed

44. Lymph node characteristics

1. Size less than 3 cms ☐

2. Size between 3-6 cms ☐

3. Size more than 6 cms ☐

4. Discrete 1.yes 2. no ☐

5. Tender 1.yes 2. no ☐

6. Location level 1(Submental & Submandibular group) ☐

7. Location level 1-3 (Upper Jugulomohyoid group) ☐

8. Location level 3-6(Lower Jugulomohyoid group) ☐

Tumour located on extraoral region:

45. Infraorbital region 1.right 2. left ☐

46. Cheek 1.right 2. left ☐

47. Parotid region 1.right 2. left ☐

48. Submandibular region 1.right 2. left ☐

49. Temporal region	1.right 2. left	
50. Frontal region	1.yes 2. No	

Intraoral examination

- Location of the tumour /tumour-like lesion:

51. Mandible anterior region	1.yes 2.no	
52. Mandible body	1.right 2.left	
53. Mandible ramus	1.right 2.left	
54. Maxilla anterior region	1.yes 2.no	
55. Maxilla body	1.right 2.left	
56. Maxilla zygomatic bone	1.right 2.left	
57. Tongue	1.yes 2. no	
58. Tongue tip	1.yes 2. no	
59. Tongue border	1.right 2.left	
60. Tongue dorsum	1.yes 2. no	
61. Tongue ventral surface	1.yes 2. no	
62. Tongue base	1.yes 2. no	
63. Hard palate	1.yes 2. no	
64. Soft palate	1.yes 2.no	

65. Hard and soft palate 1.yes 2.no ☐

66. Oropharynx 1.yes 2.no ☐

67. Upper lip outer part of the vermillion border 1.yes 2.no ☐

68. Upper lip inner part of the vermillion border 1.yes 2.no ☐

69. Lower lip outer part of the vermillion border 1.yes 2.no ☐

70. Lower lip inner part of the vermillion border 1.yes 2.no ☐

71. Upper lip in & out of the vermillion border 1.yes 2.no ☐

72. Lower lip inner & outer parts of the vermillion border 1.yes 2.no ☐

73. Corner of the mouth 1.right 2.left ☐

74. Floor of the mouth 1.yes 2.no ☐

75. Labial Mucosa 1.yes 2 .no ☐

76. Buccal mucosa 1.right 2.left ☐

79. Retromolar region 1.right 2.left ☐

80. Maxillary buccal gingival 1.yes 2.no ☐

81. Maxillary palatal gingival 1.yes 2.no ☐

82. Mandibular buccal gingival 1.yes 2.no ☐

83. Mandibular lingual gingival 1.yes 2.no ☐

84. Greatest diameter of the lesion……...

1.0-3cm

2.3-6cm

3.6-10cm

4.10-15cm

5. > 15cm

85. Texture of the lesion……

1. Rubbery

2. Soft

3. Firm

4. Bony hard

5. Fluctuant

6. Others, specify……

-Treatment modality done…

86. Observation only 1.yes 2.no

87. Chemical cautery 1.yes 2.no

88. Surgery 1.yes 2.no

89. Radiotherapy 1.yes 2.no

90. Chemotherapy 1.yes 2.no

91. Chemoradiotherapy 1.yes 2.no

92. Scelotherapy 1.yes 2.no

93. Referral 1.yes 2.no

94. Type of surgical procedure done……

1. Curettage
2. Marsupialazation
3. Enucleation
4. Remodeling
5. En block excision
6. Wide surgical excision
7. Partial/Hemi maxillectomy
8. Partial/Hemi mandibulectomy
9. Total mandibulectomy
10. Reconstruction after resection
11. Others, specify…….

95. Outcome of surgery ……

1. Cured

2. Recurrence

3. Surgical wound healed & patient referred for radio or chemotherapy

4. Death

96. Cause of death…….

97. Microscopic findings

1. Histolgical results (from the lab) HP no:……

Diagnosis ……..

Stage of the disease (if applicable)……Grade of the tumour……

98. Cytological diagnosis (from the lab) HC no:……..