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Jaw Cyst in Patients Attending Khartoum
Teaching Dental Hospital

By

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Dedication

To

My

family

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List of tables

| | |
|---------------------|--|
| Table "1" - page 25 | Gender distribution of odontogenic cysts |
| Table "2" - page 26 | Gender distribution of non-odontogenic cysts |
| Table "3" - page 27 | Age distribution of jaw cysts |
| Table "4" - page 28 | Types of jaw cysts |
| Table "5" - page 29 | Types and site distribution of Jaw cysts |
| Table "6" - page 30 | Sites distribution of mandibular cysts |
| Table "7" - page 31 | Sites distribution of maxillary cysts |

List of Figures

| | |
|----------------------|--|
| Figure "1" - page 25 | Gender distribution of odontogenic cysts |
| Figure "2" - page 26 | Gender distribution of non-odontogenic cysts |
| Figure "3" - page 27 | Age distribution of jaw cysts |
| Figure "4" - page 28 | Types of jaw cysts |
| Figure "5" - page 29 | Types and site distribution of Jaw cysts |
| Figure "6" - page 30 | Sites distribution of mandibular cysts |
| Figure "7" - page 31 | Sites distribution of maxillary cysts |

Abstract

This study carried out at Khartoum Teaching Dental hospital in the period from October, 2003 to December 2004. The aims of this study were to study the incidence and presentation of Jaw cysts among Sudanese patient who attending to K.T.D.H. , the common types of Jaw cysts , defined the common sites of cyst of that Jaws and assess the Jaw cysts in relation to age and gender.

Seventy patients with cystic lesions of the jaws were diagnosed depending on chief complain, clinical examination, aspiration and radiographic examination (periapical view, occlusal view, and O.P.G view). Forty two of them (60%) were males, and 28 (40%) were females. Patients age range between 6 to 65 years. The mean age was 35.5 and the peak age of incidence was between 2nd and 3rd decades.

Fifty cases (70%) were complaining of painless swelling, 13 (18.6%) complaining of mild toothache associated with swelling, and 7 cases (10%) complaining of painless swelling with discharge.

Forty six (65.71%) were odontogenic cysts, 21 (30%) non-odontogenic cysts, and 3 (4.29%) were pseudocysts. Odontogenic cysts, 19(27.14%) were dentigerous cysts, 18(25.17%) radicular cysts, and 9 (12.85%) keratocysts. Non-odontogenic cysts, 13 (18.57%) were nasoplatine cysts, 4(5.71%) medianpalatine cysts, 3(4.29%) nasolabial cysts, one case (1.43%) was globulo-maxillary cysts. Pseudocysts, 2 (2.86) were aneurysmal bone cysts and the last one was traumatic bone cyst and represent (1.43%).

According to types of jaw cysts, the result shows that the dentigerous cysts were the common types of jaw cysts (27.14%) followed by radicular cysts (25.7%), nasoplatine cysts (18.57%), keratocysts (12.86%), median palatine cysts (5.71%) nasolabial cysts (4.29%),

aneurysmal bone cysts (2.86%), globulo-maxillary cysts (1.43%) and traumatic cysts (1.43%).

According to the common cysts of the jaw cysts the study showed that the common sites of dentigerous cysts were mandibular third molars, followed by canines and maxillary third molars . The common sites of keratocysts were the posterior region of the mandible between the premolars teeth and ramus. The common sites of radicular cysts were the anterior region of the maxilla followed by posterior region of the maxilla, posterior region of the mandible and anterior region of the mandible. All fissural cysts were located in the anterior region of the maxilla but sometime extended to premolars region. The common sites of pseudocysts were posterior region of the mandible between the premolars and anterior border of the ramus.

Finally the study was found to be comparable to international studies , males were affected more than females, and the mean age of patients was 35.5 years.

| | | | 2004 | 2003 |
|---------|----------|----------|----------|----------|
| | | | | |
| | | (| - | - |
| | |) | | |
| | (%40) | 28 | (%60) | 42 |
| 35.5 | | | 65 - 6 | |
| 13 | | | (%70) | 50 |
| | (%10) | 7 | | (%20) |
| | | | | |
| (%30) | 21 | | (%65.71) | 46 |
| | | | (%4.29) | 3 |
| 18 | (%27.14) | 19 | | |
| | | (%12.85) | 9 | (%25.17) |
| 4 | (%18.57) | 13 | | |
| (%4.29) | 3 | | | (5.71) |
| | | (%1.43) | | |
| | (%2.86) | | | |
| | | | | (%1.43) |

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. 35.5

Contents

| | |
|-----------------------|-----|
| Dedication | I |
| Acknowledgement | II |
| List of Tables | III |
| List of Figures..... | IV |
| English Abstract..... | VI |
| Arabic Abstract | VII |

CHAPTER ONE

| | |
|--|-------|
| 1-1 Introduction | 1 |
| 1-2 Justification. | 2 |
| 1-3 Objectives | 2 |
| 1.3.1 General objective | 2 |
| 1.3.2 Specific objective | 2 |
| 1.4. Literature reviews..... | 3 |
| 1.4.1. Pathogenesis of jaw cysts | 3 |
| 1.4.1.1. Epithelial proliferation | 3 |
| 1.4.1.2. Hydrostatic pressure of cystic fluid..... | 3 |
| 1.4.1.3. Resorption of surrounding bone. | 3 |
| 1.4.2. Cystic fluid | 4 |
| 1.4.3. Classification..... | 5 |
| 1.4.3.1. M.Shear classification | 5 |
| 1.4.3.2. W.H.O. classification | 6 |
| 1.4.3.3. Cawson classification | 7 |
| 1.4.3.4. W.Crawford classification..... | 8 |
| 1.4.4. Histological features of Jaw cysts..... | 9 |
| 1.4.5. Common sites | 11 |
| 1.4.6. Clinical presentations..... | 13 |
| 1.4.7. Radiographs features..... | 17 |
| 1.4.8. Incidence. | 20 IX |

CHAPTER TWO

2. Material and Methods 23
 2.1 Material..... 23
 2.2 Methods23

CHAPTER THREE

3.1. Results..... 24

CHAPTER FOUR

4.1. Discussion 32
4.2. Conclusion.....42
4.3. Recommendation.....44
4.4. References45
4.5. Appendix (Questionnaire sheet)..... 49

CHAPTER ONE

1-1 Introduction:

A study of jaw cysts at Khartoum Teaching Dental Hospital in Sudan turned to be important, there is quite a numbers of patients who report the hospital for treatment. A study to define the incidence and morbidity of the lesion were planned. Cyst of the Jaws turned to be special pathological intity that need to be specifically study. Cysts of the jaw may show some variations in the geographic and socioeconomic presentation. All the above, made the search in jaw cysts in Khartoum Teaching Dental Hospital of great importance to identify the age, gender, types, site, and size of cyst when presented.

A cyst is defined as a pathological cavity having fluid, semi-fluid or gaseous contents and which is not created by the accumulation of pus. It is frequently, but not always, lined by epithelium⁽¹⁾.

A cyst is an abnormal cavity lined by epithelium, fibrous tissue or occasionally by neoplastic tissue. It's contents may be fluid or semi-solid. Some cysts are believed to contain gas⁽²⁾.

It is a pathologic lesion characterized by a cavity filled with fluid, cellular products, air or a combination of these. True cysts usually have an epithelial lining and a connective tissue capsule. Some entities designated as cysts do not contain an epithelial lining and are generally refereed to as pseudocysts⁽³⁾.

Some jaw cysts will be associated with teeth, found in tooth-bearing areas, these are odontogenic cysts. The others will be found in places where oro-facial processes fused. These are fissural cysts or non-odontogenic cysts⁽⁴⁾.

Jaw cysts cause slowly progressive painless swelling with no symptoms until they become large enough to be conspicuous. If infection enters, the swelling becomes painful and may rapidly expand partly due to inflammatory oedema⁽⁵⁾.

Jaw cysts can be divided into true cysts and pseudocyst .The true cysts are lined with epithelial cells and supported by connective tissue wall, while the pseudocysts are not lined with epithelial cells. There are two sources of epithelium lining. The epithelium left behind from developing teeth and epithelium left behind from face and mouth development⁽⁴⁾.

1-2-Justification:

- 1-No previous study was done on this subject before, in Sudan.
- 2-Jaw cysts are common pathological entity.
- 3-Early detection is important for better treatment outcome.

1-3-Objectives:

1-3.1.General objectives:

To study the incidence and presentation of jaws cyst in Khartoum Teaching Dental Hospital.

1-3.2.Specific objectives:

- a- Study incidence of jaw cysts among patients attending Khartoum Teaching Dental Hospital in the period from October,2003 to December,2004.
- b- To define the common sites and size of cyst of the jaw.
- c- Cystic lesion in relation to age and gender .
- d- Cyst types.

1.4.Literature Reviews (1.4.1.to 1.4.8.):

1.4.1. :Pathogenesis of jaws cyst:

1.4.1.1.Epithelial proliferation:

Infection from the pulp chamber is the source of irritation causing proliferation of the epithelial rests of malassez. That irritation from the infected pulp chamber is the main stimulus to formation of Jaw cysts⁽⁶⁾.

Jaw cysts arise from epithelium associated with formation of the teeth, oral cavity and face. If this epithelium is somehow stimulated by inflammation, for example, they proliferate forming an ever-larger mass. As epithelial cell proliferate, the cells in the center of the mass, being at some distance from the blood supply, and then central cell death produces a central cavity surrounded by viable epithelial cells, to form a true cyst⁽⁶⁾.

1.4.1.2. Hydrostatic pressure of cyst fluid:

Breakdown of cellular debris within the cysts lumen raises the protein concentration producing an increase in osmotic pressure. The result is fluid transport across the epithelial lining to the lumen from the connective tissue side. Fluid ingress assists in outward growth of the cysts⁽⁷⁾.

Radicular cyst and many other cysts expand in balloon- like fashion, wherever the local anatomy permits, indicates that internal pressure is a factor in their growth. The hydrostatic pressure within cysts is about 70 cm of water and therefore higher than the capillary blood pressure⁽⁶⁾.

1.4.1.3. Resorptions of surrounding bone:

Bone resorbing factors, such as prostoglandins, interleukin, and protenases, from inflammatory cells and cells in the peripheral portion of the lesion permit additional cyst enlargement ⁽⁷⁾.

1.4.2.Cystic fluid:

The fluid is usually watery and opalescent or sometimes thicker, more viscid and yellowish. Cholesterol crystals may be seen and give it a shimmering appearance. A smear of this fluid may show the characteristic notched cholesterol crystals under the microscope. In a section of a cyst the protein content of the fluid is usually seen as amorphous eosinophilic material, often containing broken-down leucocytes and cells distended with fat globules⁽⁶⁾.

Dentigerous and periodontal cysts usually yield a clear pale straw-coloured fluid containing varying amounts of cholesterol crystals. These have a bright glistening appearance, which can be seen if the syringe is held under a beam of light or if some fluid is expressed onto a dry swab. When haemorrhage into the cyst has recently taken place an opaque, dark brown fluids will be aspirated. Odontogenic keratocysts contain a creamy white, viscid suspension of keratin⁽²⁾.

Keratocyst contain a dirty white viscid suspension of keratin which has an appearance of pus, but without an offensive smell. In Traumatic cyst, a deep yellow coloured fluid may be aspirated, and a heavily blood stained fluid or fresh blood may be obtained, some cysts may be empty or contain gas such as nitrogen, oxygen and carbon dioxide. In aneurysmal bone cyst, a dark venous blood can be aspirated⁽⁸⁾.

1.4.3. Classification Of Jaw Cysts:

1.4.3.1. M. Shear classification (1983):

A. Epithelial

1. Odontogenic:

A. Developmental:

- i. Primordial cyst (keratocyst) .
- ii. Gingival cyst of infants.
- iii. Gingival cyst of adults.
- iv. Lateral periodontal cyst.
- v. Dentigerous (Follicular) Cyst.
- vi. Eruption Cyst.
- vii. Calcifying odontogenic cyst.

B. Inflammatory :

- i. Radicular cyst.
- ii. Residual cyst.
- iii. Inflammatory collateral cyst.
- iv. Paradental cyst.

2-Non-odontogenic:

- i. Nasopalatine duct (incisive canal) cyst.
- ii. Median palatine, median alveolar and median mandibular cysts.
- iii. Globulomaxillary cyst.
- iv. Nasolabial (nasoalveolar) cyst.

B. Non – epithelial

1-Simple bone cyst (traumatic, solitary haemorrhage bone cyst).

2-Aneurysmal bone cyst.

1.4.3.2. W.H.O Classification (1995):

Developmental cysts:

1.Odontogenic cysts:

1.1. Gingival cyst of infant (Epstein Pearls).

1.2. Odontogenic keratocyst (primordial cyst).

1.3. Dentigerous (Follicular) Cysts.

1.4. Eruption cyst.

1.5. Lateral periodontal cyst.

1.6. Gingival cyst of adults.

1.7. Glandular Odontogenic cyst, sialo-odontogenic cyst

2.Non – odontogenic cysts:

2.1. Nasopalatine duct (incisive canal) cyst.

2.2. Nasolabial (nasoalveolar) cyst.

Inflammatory cysts:

1. Radicular Cyst:

1.1. Apical and lateral radicular cyst.

1.2. Residual radicular cyst.

2. .Paradental (inflammatory collateral, mandibular infected buccal) cyst.

1.4.3.3.Cawson Classification (2002):

Developmental cysts:

Odontogenic cysts:

- Gingival cysts of infant (Epstein Pearls).
- Odontogenic keratocyst (Primordial cyst).
- Dentigerous (Follicular) cyst .
- Eruption cyst.
- Lateral periodontal cyst.
- Gingival cyst of adults.
- Glandular odontogenic cyst : sialo-odontogenic cyst.

Non-odontogenic cysts:

- Nasopalatine duct cyst.
- Nasolabial cyst.

Inflammatory odontogenic cysts:

- Radicular cysts:-
 - Residual cyst.
 - Lateral cyst.
- **Paradental cyst.**

A.odontogenic jaw cysts:

- Apical cyst.
- Dentigerous cyst.
- Primordial cyst.
- Odontogenic keratocyst.
- Residual cyst.

B.Non- odontogenic (Fissural) cysts:

- Papilla palatini cyst.
- Incisive canalcyst.
- Median palatal cyst.
- Globulomaxillary cyst.
- Nasolabial cyst.

We are going to adopt the WHO classification in our study.

1.4.4.Histological features of jaw cysts:

1.4.4.1.Radicular (apical -residual) cysts:

The periapical cyst is lined by nonkeratinized stratified squamous epithelium of variable thickness. Transmigration of inflammatory cells through the epithelium is a common finding. The underlying supportive connective tissue may be focally or diffusely infiltrated with a mixed inflammatory cell population. Toward the epithelium, polymorphonuclear leukocytes dominate, deeper within the connective tissue; lymphocytes are more common ⁽⁷⁾.

Periapical (radicular-residual) lesions should be removed for histologic examination such study will reveal a cyst with a central debris-filled cavity lined with stratified squamous nonkeratinizing epithelium. The outer fibrous connective tissue wall shows many chronic inflammatory cells suggesting the inflammatory origin of this cyst ⁽⁴⁾.

1.4.4.2.Dentigerous cyst:

The epithelial lining is not keratinized. Sometimes the superficial layer of the epithelial lining is low columnar and retains the morphology of the ameloblast layer ⁽⁹⁾.

Histological Examination usually shows a thin fibrous cyst wall which being derived from dental follicle, consists of young fibroblasts widely separated by stroma and ground substance rich in acid mucopolysaccharid ⁽¹⁾

1.4.4.2.Keratocyst or primordial cysts:

The cysts are lined by a regular keratinized stratified squamous epithelium which is usually about 5 - 8 cell layers thick and without rete ridges. The form of keratinization is exclusively parakeratic in a bout 80 % of cases, but in sometimes orthokeratotic and both forms are found in different parts of some cysts⁽¹⁾.

The majority of keratocyst (70%) present a thin layer of parakeratin at the epithelial surface. The remaining 30% of cases present orthokeratin. The connective tissue is generally free of inflammatory cells⁽¹⁰⁾.

1.4.4.4.Nasopalatin duct cyst:

Nasopalatin cysts lined by respiratory epithelium originate from nasopalatin duct adjacent to the nasal cavity⁽¹⁾.

The epithelial linings of nasopalatin duct cysts are extremely variable, stratified squamous, pseudostratified columnar, cuboidal, columnar or primitive flat epithelium may be seen, individually or in combination⁽¹⁾. The epithelial lining of this cyst ranges from stratified squamous to pseudostratified columnar when located near the nasal cavity⁽⁷⁾.

1.4.4.5.Median palatine cysts:

These cysts are lined exclusively by stratified squamous epithelium, some of these cysts are lined by pseudostratified ciliated columnar, cuboidal or columnar epithelium⁽¹⁾.

Median palatal cysts are lined with stratified squamous nonkeratinizing epithelium⁽⁴⁾.

1.4.4.6.Nasolabial cyst:

Nasolabial cysts are usually lined by Pseudostratified columnar epithelium with or without some stratified columnar epithelium in addition⁽⁶⁾.

The epithelial lining of this cyst is characteristically a Pseudostratified columnar type with numerous goblet cells. Stratified squamous epithelium may be present in addition to cuboidal epithelium in some cases⁽⁷⁾.

Nasolabial cysts are lined with stratified squamous nonkeratinizing epithelium⁽⁴⁾.

1.4.4.7.Globulomaxillary cysts:

Microscopic examination reveals a cyst that is lined with stratified squamous nonkeratinizing epithelium; the histology varies considerable from case to case⁽⁴⁾.

The epithelial lining is of Pseudostratified columnar ciliated epithelium often derived from the nasal mucosa ⁽⁸⁾.

1.4.4.8. Traumatic (simple) bone cyst:

The simple bone cyst consists of loose vascular fibrous tissue membrane of variable thickness with no epithelial lining ⁽¹⁾.

Microscopically delicate, well-vascularized, fibrous connective tissue without evidence of an epithelial component is identified ⁽⁷⁾.

No visible lining is generally seen, in some cases, a thin membrane granulation tissue or blood clots may be evident. Loose vascular fibrous tissue membrane with hemosiderin pigment may be seen with small multinucleate cells ⁽⁸⁾.

1.4.4.9. Aneurysmal bone cyst:

The lesions consist of many capillaries and blood-filled spaces of varying size lined by flat spindle cells and separated by delicate loose - textured fibrous tissue ⁽¹⁾.

Microscopically exhibits no epithelial lining, the fibrous connective tissue stroma contain variable numbers of multinucleated giant cell. The sinusoidal spaces are not lined by endothelial cells ⁽⁷⁾.

1.4.5. Common Sites of Jaw Cysts:

1.4.5.1. Radicular (apical, residual) Cysts:

The common sites of radicular cysts are anterior region of maxilla followed by posterior region of mandible ⁽¹²⁾.

Radicular (apical, residual) Cysts are located in the maxilla, especially the anterior region, followed by the maxillary posterior region, the mandibular posterior region and finally the mandibular anterior region ⁽⁷⁾.

1.4.5.2. Dentigerous cyst:

Dentigerous cyst usually found in mandible in third molar region. Canine is the most common site in maxilla ⁽¹²⁾.

Dentigerous cyst is usually found in the mandibular third molars, maxillary canines and maxillary third molars. Dentigerous cysts are usually found in the mandibular third molars, maxillary canines, and maxillary third molars ⁽¹³⁾.

1.4.5.3.Keratocysts (Primordial cysts) :

Keratocysts (Primordial cysts) usually occur in the angle of the mandible, and extending into ascending ramus and forward into the body of mandible, they can occur in anywhere in the jaws, including the midline of mandible and maxilla and the globulomaxillary area in the maxilla ⁽¹⁴⁾.

Keratocysts usually occur in the posterior portions of the body of the mandible and ramus region, and in the maxilla, the third molar area is most frequently affected ⁽⁷⁾.

1.4.5.4.Nasopalatine duct cysts:

Nasopalatine canal cysts or incisive canal cysts are located within the palatal soft tissue, at the point of the opening of the canal ⁽⁷⁾.

The nasopalatine duct cyst is located between and apical to the two maxillary central incisors in the midline of maxilla ⁽¹³⁾.

1.4.5.5.Median palatine cysts:

Median palatal cyst or median alveolar cysts are located in the maxilla midline posterior to the incisive canal ⁽⁴⁾.

Median palatine cysts are located in the hard palate between the incisive fossa and the posterior border of the hard palate ⁽⁸⁾.

1.4.5.6.Nasolabial cyst:

Nasolabial cyst occurs outside the bone in the nasolabial folds below the alae nasi ⁽¹⁾.

Nasolabial cyst is located in the soft tissue over the canine region or the mucobuccal fold ⁽⁷⁾.

1.4.5.7. Globulomaxillary cyst:

Globulomaxillary cyst is located between the maxillary lateral incisor and canine teeth ⁽¹⁾.

The globulomaxillary cyst is located between the globular and maxillary processes ⁽⁷⁾.

1.4.5.8. Traumatic bone cysts:

Traumatic bone cysts occur mostly in the premolar and molar regions of the mandible above the inferior dental canal, and may be found in the lower incisor region, and the ramus and symphyseal area. In the maxilla, traumatic cyst is located in the anterior region ⁽¹⁵⁾.

Traumatic cysts occur mostly in the premolar and molar regions of the mandible above the inferior dental canal, but may be found also in the lower incisor region and the ramous ⁽²⁾.

1.4.5.9..Aneurysmal bone cyst:

Aneurysmal bone cyst is located in the molar region of the mandible and maxilla, in the mandible lesions are extended to the angle and ascending ramus ⁽¹⁾.

The mandible and maxilla are involved, the more posterior regions are affected chiefly the molar areas ⁽⁷⁾.

1.4.6. Clinical presentations of jaw cysts:

1.4.6.1. Radicular (apical – periapical – residual) cysts:

Most periapical (radicular) cysts are asymptomatic, and are often discovered incidentally during routine dental radiographic examination. A non-vital pulp is necessary for the clinical diagnosis of a periapical cyst ⁽⁷⁾.

The swelling is rounded and at first hard. Later when the bone has been reduced to egg-shell thickness, a crackling sensation may be felt on pressure. Finally part of the wall is resorbed entirely away, leaving a soft fluctuant swelling, bluish in colour beneath the mucous membrane ⁽⁶⁾.

This lesion is usually not associated with signs or symptoms (asymptomatic), however patients may report past drainage, and/or pain in the area. The offending tooth will have deep carious lesion, deep restoration or inadequate root canal filling ⁽⁴⁾.

1.4.6.2.Dentigerous cysts :

Dentigerous cysts may grow to a large size before they are diagnosed. Most of them are discovered on radiographs when these are taken because a tooth has failed to erupt, or a tooth is missing. Dentigerous cysts may occasionally be painful particularly if infected ⁽¹⁾.

Like other cysts, uncomplicated, dentigerous cysts cause no symptoms until the swelling becomes noticeable. Infection of a dentigerous cyst causes the usual symptoms of pain and increased swelling ⁽⁴⁾.

Dentigerous cysts are most commonly seen in association with third molars and maxillary canines, the most frequently impacted teeth. Lesions may rarely achieve a size that predisposes to a pathologic fracture⁽⁷⁾.

1.4.6.3.Keratocyst (Primordial cyst):

The maxillary cysts are more likely to become infected even when small than the mandibular cysts and will probably, therefore, be diagnosed at an earlier stage in their development ⁽¹⁴⁾.

Patients with primordial cysts complain of painless swelling with discharge, occasionally they experience paraesthesia of lower lip or teeth. In many instance, patients are remarkably free of symptoms until the

cysts have reached a large size, involving the entire ascending ramus and angle of the mandible ⁽¹⁾.

These cysts resemble dentigerous cysts, but if they are opened the crown of the tooth is not seen protruding into the cavity ⁽²⁾.

1.4.6.4.Nasopalatine duct cysts :

The most common symptom is swelling, usually in the anterior region of the midline of the palate. In some cases fluctuation may be elicited between the labial and palatal swellings. The swelling has been associated with pain and discharge, the discharge may be mucoid in which case the patients sometimes describe a salty taste and complain of a foul taste ⁽¹⁾.

Nasopalatine cysts appear as asymmetric swelling in the anterior region of the palatal midline is characteristic of this lesion. Most cases are asymptomatic, with the clinical sign of swelling usually calling attention to the lesion. Symptoms may follow secondary infection. Sinus formation and drainage is not uncommon and usually occurs at the most prominent portion of the palatine papilla ⁽⁷⁾.

Nasopalatine duct cysts are slow-growing and resemble other cysts of the jaws. Occasionally they cause intermittent discharge with a salty taste. If allowed to grow sufficiently large nasopalatine cysts may cause a swelling in the midline of the anterior part of the palate ⁽⁶⁾.

1.4.6.5.Median palatine cyst:

Median palatine cyst is uncommon, but should be kept in mind, if a mid-palatal swelling is encountered. Small lesions are usually invisible on clinical intraoral examination. However, these cysts don't have to become very large to raise the palatal mucosa causing an intraoral swelling ⁽⁴⁾.

No signs and symptoms exist, unless the cyst becomes large, with expansion of bone and a palpable ovoid swelling in the mid-palatal region or mid-alveolar region ⁽⁸⁾.

1.4.6.6.Nasolabial cyst:

The most frequent symptom is swelling and very often this is the only complaint. Sometimes the patients complain of pain and difficulty in

nasal breathing. The cysts grow slowly, producing a swelling of the lip. They fill out the nasolabial fold and may lift the ala nasi, distort the nostril and produce a swelling of the floor of the nose. The cysts are Fluctuant and on bimanual palpation, fluctuation may be elicited between the swelling on the floor of the nose and that in the labial sulcus ⁽¹⁶⁾.

The chief clinical sign of the nasolabial cyst is a soft tissue swelling that may present in the soft tissue over the canine region or the mucobuccal fold. Occasionally, the patients may complain of discomfort or some minor degree of nasal obstruction ⁽⁷⁾.

1.4.6.7.Globulomaxillary cyst:

Globulomaxillary cyst was found between the maxillary lateral incisor and canine teeth ⁽¹⁾.

Globulomaxillars cysts are usually asymptomatic and therefore are undetected on routine clinical intraoral examination ⁽⁴⁾.

1.4.6.8.Traumatic (simple) bone cyst:

The simple bone cyst is not a common lesion. Swelling was the presenting symptom, Patients may complain of labial paraesthesia. Mandibular swelling most frequently buccal and labial , and only occasionally lingual . The related teeth were all vital ⁽¹⁷⁾.

The simple bone cyst is usually symptomless and detected as an incidental finding during a radiographic examination. If the cyst becomes large enough it may causes expansion of either the buccal or lingual cortex or both so that the patient complains of a swelling ⁽²⁾.

1.4.6.9.Aneurysmal bone cysts:

Aneurysmal bone cysts of the jaws produce firm swelling, which have been described as a painful, in fewer than half of the reported cases. The swelling and malocclusion frequently become

progressively worse. Occasionally there is a history of recent displacement of teeth, which remain vital ⁽¹⁾.

The lesion usually presents during adolescence as a large expansile lesion in the mandible or more rarely, the maxilla ⁽²⁾.

When the mandible and maxilla are involved, the more posterior regions are affected, chiefly the molar areas, pain is described in approximately half the cases and a firm, nonpulsatile swelling is a frequent clinical sign ⁽⁷⁾.

1.4.7. Radiographic features of jaw cysts:

1.4.7.1. Radicular (apical- residual) cysts:

The classic description of the radiological appearance of radicular cysts is that they are rounded or ovoid radiolucencies surrounded by a narrow radio- opaque margin which extends from the lamina dura of the involved tooth ⁽¹⁾.

Radicular (apical-residual) cysts appear as a peri or para-apical round or oval radiolucency of variable size, rarely radicular cysts will induce resorption of the root of the affected tooth ⁽¹⁸⁾.

1.4.7.2. Dentigerous cyst.

The appearance is that of a well-defined cyst containing the crown of a tooth displaced from its normal position. The cavity is rounded and unilocular, occasionally there may be Pseudoloculation as a result of trabeculation or ridging of the bony wall ⁽⁶⁾.

Dentigerous cysts appear as a unilocular radiolucency with well-defined sclerotic margins encircling the crown of an unerupted tooth ⁽¹³⁾.

Dentigerous cysts have a well-defined sclerotic margins unless when they are infected then the margins are poorly defined . With the pressure of an enlarging cyst, the unerupted tooth can be pushed away from its direction of eruption, e.g. the lower third molar may be pushed to the inferior border or into the ascending ramous ⁽⁸⁾.

1.4.7.3. Keratocyst or (primordial) cyst:

Keratocyst or primordial cyst may appear radiologically as small round or ovoid radiolucent area. The majority are unilocular radiolucencies, and many of these have a smooth periphery⁽¹⁾.

Most keratocysts are unilocular presenting a well-defined peripheral rim. Scalloping of the border is also a frequent finding and this represents variation in the growth pattern of the cyst. Multilocular radiolucent keratocyst is also observed, generally representing a central cavity having satellite cysts. Occasionally keratocyst may mimic a dentigerous cyst and contain the Crown of a retained tooth within its lumen ⁽¹⁹⁾.

The keratocyst can be unilocular or multilocular . Majority of the unilocular radiolucencies have a smooth periphery, some may have scalloped margins. Multilocular cysts can have various radiographic appearances e.g. one large cysts and some smaller daughter cysts given the polycystic appearance ⁽⁸⁾.

1.4.7.4.Nasopalatine-canal cyst:

Radiological examination shows a rounded, ovoid or occasionally heart-shaped radiolucent area with a well-defined often sclerotic margin in the anterior part of the midline of the maxilla ⁽⁶⁾.

Nasopalatine canal cyst is purely radiolucent with sharply defined margins. It may produce divergence of the roots of the maxillary incisor teeth and less commonly induce external root resorption⁽⁷⁾.

Many nasopalatine canal cysts appear as heart-shaped radiolucency located just posterior to the maxillary incisor teeth⁽⁴⁾.

1.4.7.5. Median palatine cysts:

Median palatine cysts appear as radiolucency in the midline of the hard palate posterior to the incisive canal. The radiolucencies of median palatal cyst are best seen on occlusal films ⁽⁴⁾.

A maxillary occlusal view will help to identify the ovoid or irregular radiolucencies in the mid-palatal region, often it becomes difficult to distinguish this cyst from an extensive incisive canal cyst⁽⁸⁾.

1.4.7.6. Nasolabial cysts:

Nasolabial cyst appears as a localized increased radiolucency of the alveolar processes above the apices of the incisor teeth⁽²⁰⁾.

Standard occlusal radiographs show a pronounced posterior convexity in one half of the bracket-shaped radioopaque line which form the bony border of the nasal aperture ⁽¹⁾.

1.4.7.7. Globulomaxillary cyst:

Globulomaxillary cysts appears as well-defined radiolucency, often producing divergence of the roots of the maxillary lateral incisor and canine teeth ⁽⁷⁾.

Globulomaxillary cysts appears as radiolucency between the lateral incisors and canine teeth on periapical radiographs. The radiolucent lesion is usually shaped like an upside-down pear spreading adjacent roots ⁽⁴⁾.

1.4.7.8. Traumatic (simple) bone cyst:

The lamina dura may or may not be lost and occasional root resorption may occur. Bony septa may be present ⁽²¹⁾.

The lesions are sometimes interpreted as multilocular radiolucent area ⁽²²⁾.

Traumatic (simple) bone cyst appears as a radiolucent area with an irregular but definite edge and slight cortication. An

occlusal view shows the radiolucency extending a long cancellous bone⁽¹⁾.

1.4.7.9. Aneurysmal bone cyst:

The aneurysmal bone cyst produces a radiolucent area which expands the bone and may balloon the cortex, and which is usually unilocular, others are described as multilocular or honeycomb-like. Teeth may be displaced and root resorption has been described⁽¹⁾.

The radiographic features of Aneurysmal bone cysts are an oval or spherical bone cavity showing substantial expansion and covered by sub-periosteal new bone, but with internal ridges and incomplete septa giving a septate appearance. Occasional patches of fine bony trabeculation are seen in some examples⁽²⁾.

The lesions are usually unilocular, they may be oval or spherical in shape, causing considerable ballooning of the cortex. They generally show a subperiosteal layer of new bone. At times internal ridges or incomplete septae may give a multilocular appearance also described as honey-comb or soap-bubble appearance⁽⁸⁾.

1.4.8. Jaws cyst incidence:

1.4.8.1. Radicular (apical - residual) cysts:

Radicular (apical - residual) cysts account for approximately (60/70%) of all odontogenic cysts and (10 per cent) of all inflammatory cysts. They are more common in males than females⁽²³⁾.

Radicular cysts showed the highest incidence (49.3%) of jaw cysts⁽²⁴⁾.

M. Shear 1983, found that 740 out of 1345 jaw cysts were radicular cysts which comprises 55%. He also found that 388 (58%) out of 664 jaw cysts were males and 276 (42%) were females.

1.4.8.2. Dentigerous cysts :

Dentigerous cysts is the second most common odontogenic cyst in the jaw bones. The highest incidence of dentigerous cysts

occurs during the second and third decades. There is a greater frequency in males, with a ratio of 1.6 to 1 reported⁽⁷⁾.

M. Shear in 1983, found that the 233 (17.3%) out of 1345 jaw cysts were dentigerous cysts, and he found the frequency of dentigerous cysts is significantly greater in males than females. He found that 134 (62%) out of 218 cases (62%) were male.

Prof. T. Nakajima 2003, found that the dentigerous cyst incidence represents 13% of all jaw cysts.

1.4.8.3.Keratocysts:

Keratocysts represents between (1.5-11 %) of all jaw cysts, and its more prevalent in males than in females with a ratio of 2:1⁽¹⁹⁾. T. Nakajima 2003, found that the keratocysts were represent about (10,8 %) of all Jaw cysts. Quinn and Ryan 2002 found that 11% of the jaw cysts were keratocysts. Summer 2001, found that 3-13% of all jaw cysts were keratocysts. Also he found that the incidence of keratocysts are more frequently in males than in females .

1.4.8.4.Nasopalatine duct cysts:

175 (11.7%) of the 1345 jaw cysts registered as nasopalatine duct cysts. Nasopalatine duct cysts were more incidence in males than females. In a series of 157 patients, 119 (76%) were males and 38 (24%) were females⁽¹⁾.

The overall frequency of nasopalatine canal cysts in the general population ranges from (0.08 to 1.3 %), as determined from analysis of specimen skulls. The majority of cases occur between the 4th and 6th decades of life. Males are more frequently affected than females, differences ranged as high as 3 to 1⁽⁷⁾.

Nasopalatine duct cyst represent (3.8 %) of all jaw cysts⁽⁸⁾

1.4.8.5.Nasolabial cysts :-

119 patients (79%) of Nasolabial cysts were females and 32 patient (21%) were males⁽²⁵⁾.

There is a wide age distribution ranging from 12 to 75 years, with a peak frequency in the fourth and fifth decades ⁽¹⁾.

Nasolabial cysts are uncommon Lesions with a wide age distribution. They are seen to occur in the third, fourth, and fifth decades of life. They have been seen predominantly in the female sex ⁽⁸⁾.

1.4.8.6.Traumatic (simple) bone cysts:

16 patients of the 29 Traumatic cysts were males and 10 patients were females ⁽¹⁷⁾.

13 patients of the 23 cases of traumatic cysts were females and 10 were males⁽²⁾.

Traumatic (simple) bone cysts represent about (2.3%) of all jaws cysts ⁽⁸⁾.

Traumatic cyst is seen in the first two decades of life (10 – 20years of age). Males are affected more often than females ⁽⁸⁾.

1.4.8.7.Aneurysmal bone cysts:

Aneurysmal bone cysts incidence in the cranial and maxillo-facial area is approximately 5% of bone lesions. Within the craniofacial complex, approximately 40% of these lesions are located in the mandible, 25% in the maxilla. The aneurysmal bone cyst typically affects persons younger than 30 years. The peak incidence occurs within the second decade of life. There is a slight female predilection ⁽⁷⁾.

28 patients (62%) of the 45 patients with aneurysmal bone cysts were females and 17 (37%) were males ⁽²⁶⁾.

CHAPTER TWO

2. Material and Methods: -

2.1.Materials: -

Patients attended Oral and Maxillofacial Department with jaw cysts at Khartoum Teaching Dental Hospital in the period from October,2003 to December,2004.

2.1.1.Study type: -

Prospective study.

2.1.2.Study area: -

Oral and Maxillofacial Department in Khartoum Teaching Dental Hospital.

2.1.3.Sample size: -

70 patients with jaw cysts attending to Khartoum Teaching Dental Hospital.

2.1.4.Study population:

Patients attending Khartoum Teaching Dental Hospital with Jaws cyst.

2.2.Methods:

2.2.1.All patients will be interviewed, for their social history and Chief complaint.

2.2.2.Clinical examination.

2.2.2.1.Extra-oral examination.

2.2.2.2.Intra-oral examination.

2.2.3.Radiographs examination: -

2.2.3.1.Periapical view.

2.2.3.2.Occlusal view.

2.2.3.3.Panonramic (O.P.G) view .

CHAPTER THREE

3.1. RESULTS

Seventy patients with jaw cysts were seen at Khartoum Teaching Dental Hospital in the period from October,2003 to December,2004. 50 of them (71.4%) complained of painless swelling, 13 (18.6%) complained of mild toothache, and 7 (10%) were complained of painless swelling with discharge. 42 (60%) were males and 28 (40%) females, males to females ratio was 3: 2 (table 7 and 8). Patient age range between 6 - 65 years. The mean age was 35,5, the peak age of incidence was between 2nd and 3rd decades (table 9).

Forty Six cases (65.71%) were odontogenic cysts, 21 (30%) non-odontogenic cysts, and 3 (4.29%) were Pseudocysts (table 1).

Nineteen cases (27,14%) were dentigerous cysts, 18 (25.7%) radicular cysts , 9(12.85%) keratocysts, 13(18.57%) nasopalatine cysts, 4(5.71%) medianpalatine cysts, 3(4.29%) nasolabial cysts , one case (1.43%) globulo maxillary cysts, 2(2.86%) aneurysmal bone cysts, and the last one was Traumatic cyst and represent (1.43%) (table 2).

In the mandible, 19 cases were located on the posterior part, 4 cases on anterior, and 7 cases on anterior posterior (table 6). In the upper jaw 24 cases were located in anterior part, 7 cases in posterior and 9 cases in anterior posterior region (table 5). It was found that the incidence of cyst between maxilla and mandible was 4: 3.

Table (1)

Gender distribution of odontogenic cysts

| Types of cysts | Male | Percentage | Female | percentage | Total |
|-------------------|------|------------|--------|------------|-------|
| Dentigerous cysts | 13 | 68.421% | 6 | 31.578% | 19 |
| Radicular cysts | 10 | 55.555% | 8 | 44.444% | 18 |
| Keratocysts | 5 | 55.555% | 4 | 44.444% | 9 |
| Total | 28 | 60.869% | 18 | 39.130% | 46 |

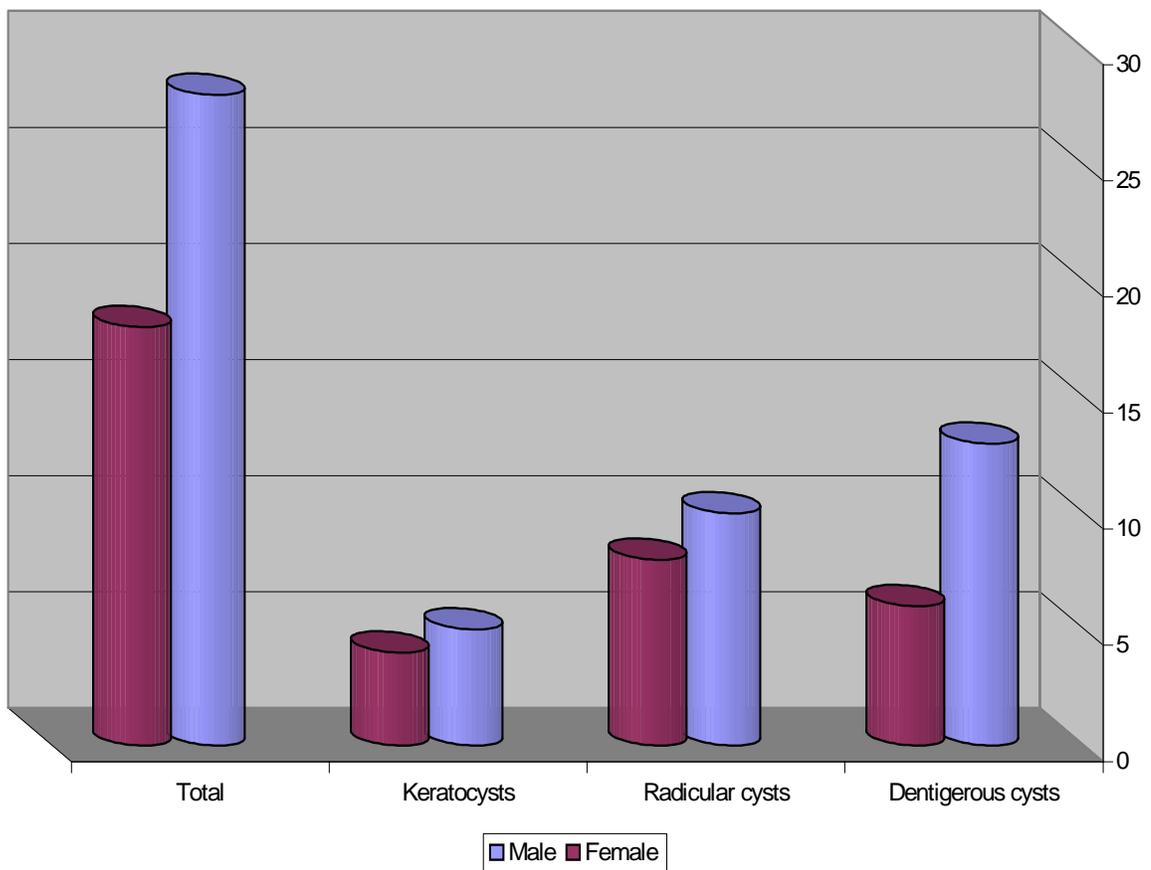


Figure (1)

Gender distribution of odontogenic cysts

Table (2)

Gender distribution of non-odontogenic cysts

| Types of cysts | Male | Percentage | Female | percentage | Total |
|--------------------------|------|------------|--------|------------|-------|
| Nasopalatin cysts | 7 | 53.846% | 6 | 46.153% | 13 |
| MedianPalatin cysts | 4 | 100% | 0 | 0 | 4 |
| Nasolabial cysts | 1 | 33.333% | 2 | 66.666% | 3 |
| Globulomaxillary cysts | 1 | 100% | 0 | 0 | 1 |

| | | | | | |
|-------|----|---------|---|---------|----|
| Total | 13 | 61.904% | 8 | 38.095% | 21 |
|-------|----|---------|---|---------|----|

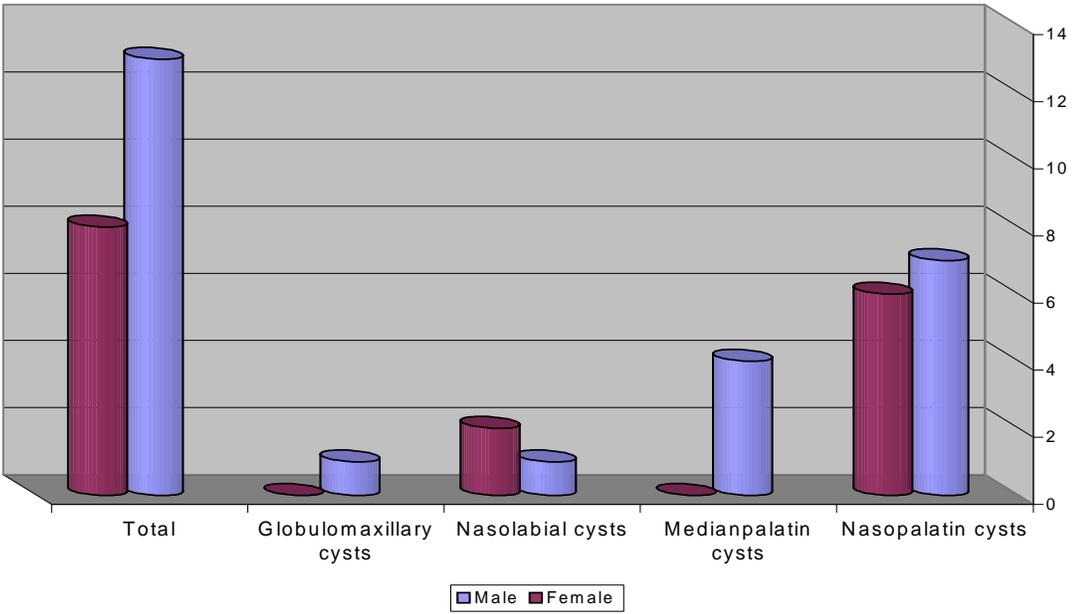


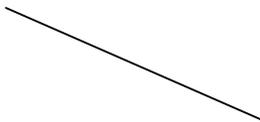
Figure (2)

Gender distribution of non-odontogenic cysts

| Age of patient | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | Total |
|------------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|
| Type of cysts | | | | | | | | | |
| Dentigerous cysts | 1 | 8 | 3 | 4 | 1 | 1 | 1 | - | 19 |
| Radicular cysts | - | 3 | 9 | 1 | 2 | 1 | 2 | - | 18 |
| Keratocysts | - | 4 | 3 | - | 1 | 1 | - | - | 9 |
| Nasopalatin cysts | - | 1 | 5 | 3 | 1 | 1 | 2 | - | 13 |
| Medianpalatin cysts | - | 1 | 2 | 1 | - | - | - | - | 4 |
| Nasolabial cysts | - | 1 | 2 | - | - | - | - | - | 3 |
| Globulomaxillary cysts | - | - | 1 | - | - | - | - | - | 1 |
| Aneurysmal bone cysts | 1 | 1 | - | - | - | - | - | - | 2 |
| Traumatic cysts | - | 1 | - | - | - | - | - | - | 1 |
| Total | 2 | 20 | 25 | 9 | 5 | 4 | 5 | - | 70 |

Table (3)

Age distribution of Jaw cysts



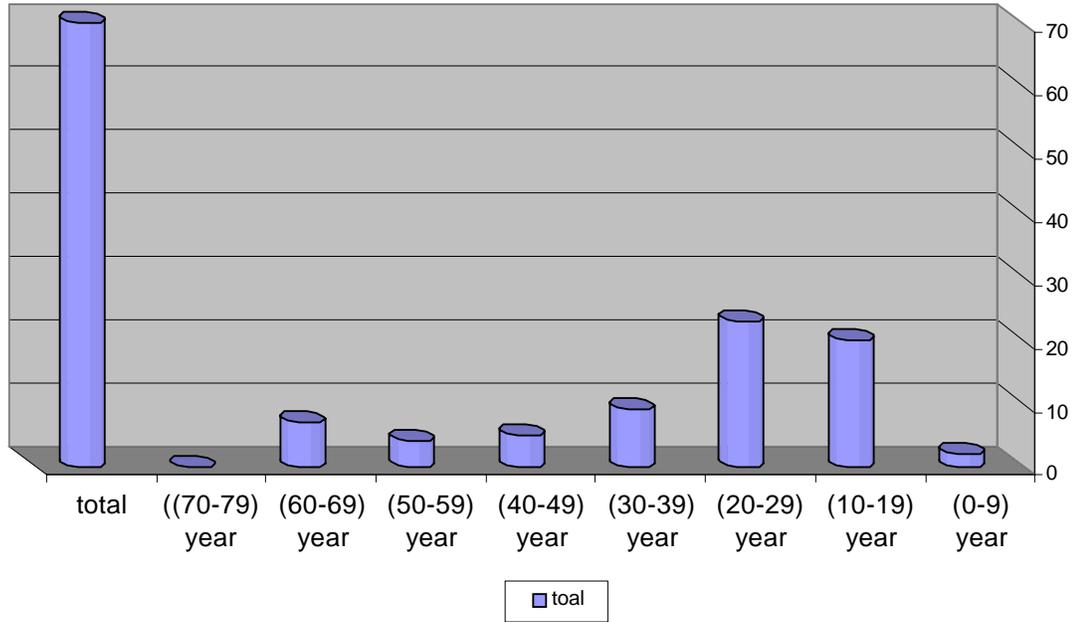


Figure (3)

Age distribution of Jaw cysts

Table (4)
Types of cysts

| Type of cysts | Mandible | <i>Maxilla</i> | Total | Percentage |
|--------------------------|----------|----------------|-------|------------|
| Odontogenic cysts | 30 | 16 | 46 | 65.714% |
| Non Odontogenic cysts | 0 | 21 | 21 | 30% |
| Pseudocysts | 2 | 1 | 3 | 4.285% |
| Total | 32 | 38 | 70 | 99.999% |

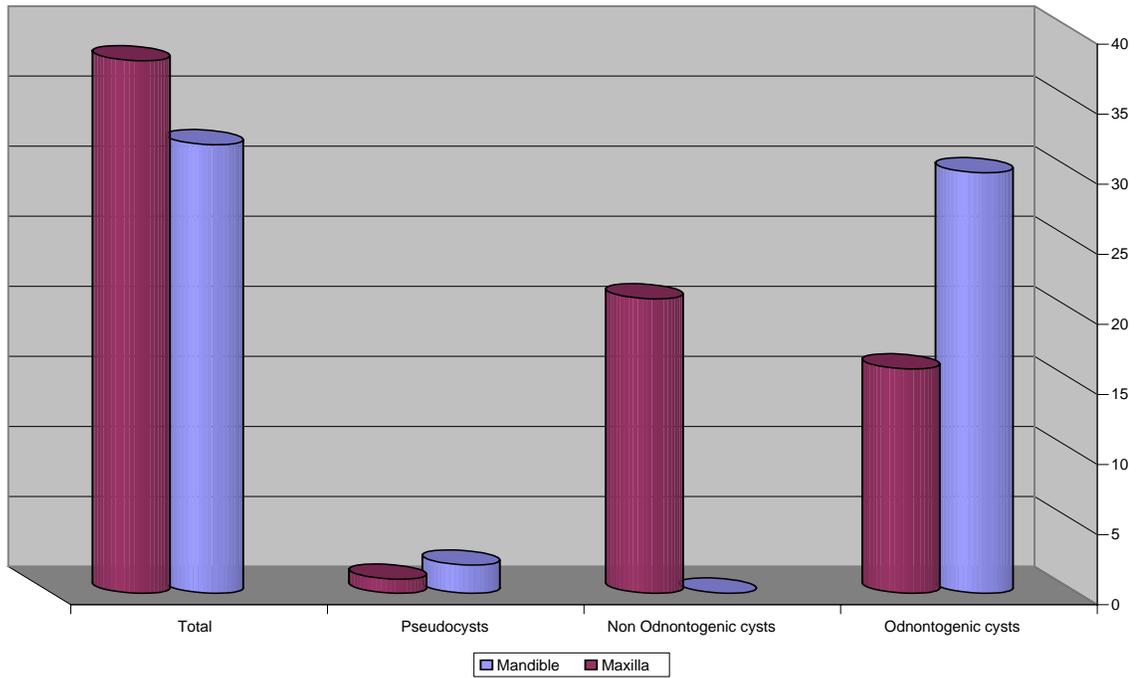


Figure (4) : Types of cysts

Table (5)
Types and Site Distribution of 70 patients with jaw cysts in KDTH

| Type of cysts | Mandible | Maxilla | Total | Percentage |
|------------------------|----------|---------|-------|------------|
| Dentigerous cysts | 11 | 8 | 19 | 27.142% |
| Radicular cysts | 8 | 10 | 18 | 25.714% |
| Keratocysts | 9 | 0 | 9 | 12.857% |
| Nasopalatin cysts | 0 | 13 | 13 | 18.571% |
| MedianPalatin cysts | 0 | 4 | 4 | 5.714% |
| Nasolabial cysts | 0 | 3 | 3 | 4.285% |
| Globulomaxillary cysts | 0 | 1 | 1 | 1.428% |
| Aneurysmal bone cysts | 1 | 1 | 2 | 2.857% |
| Traumatic cysts | 1 | 0 | 1 | 1.428% |
| Total | 30 | 40 | 70 | 99.95% |

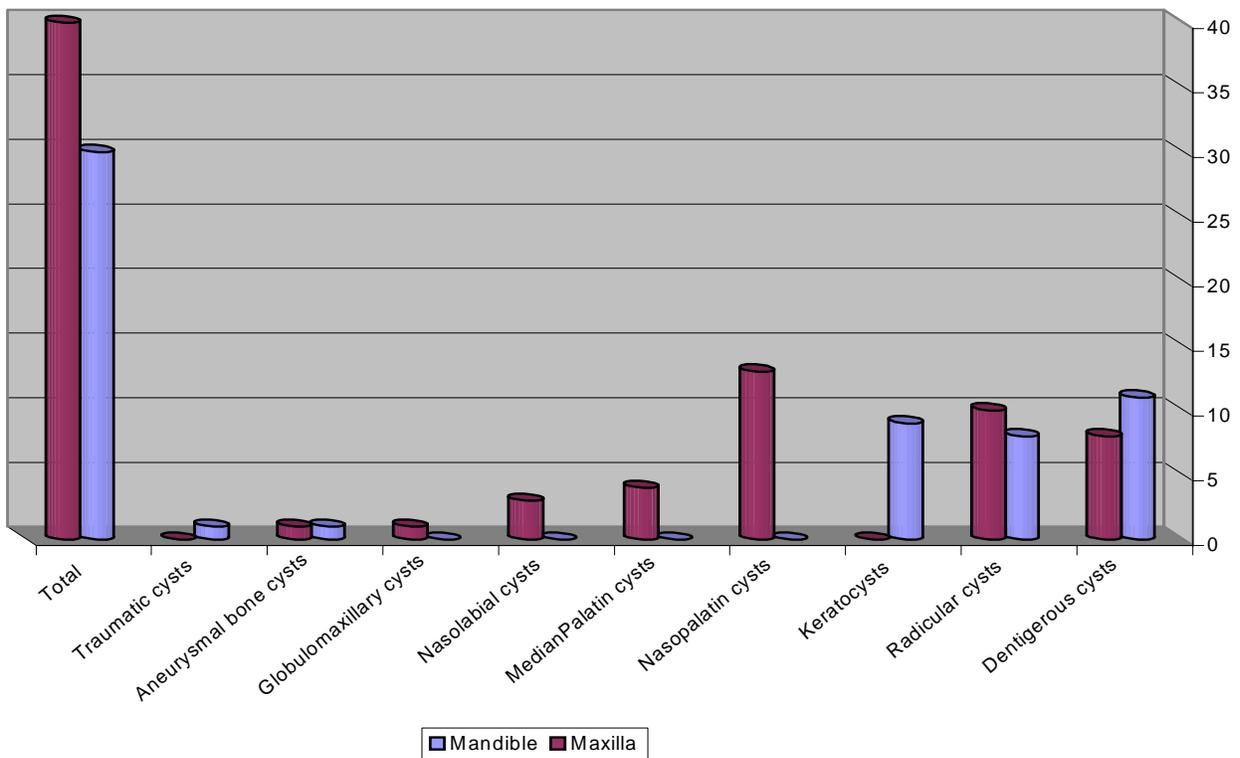
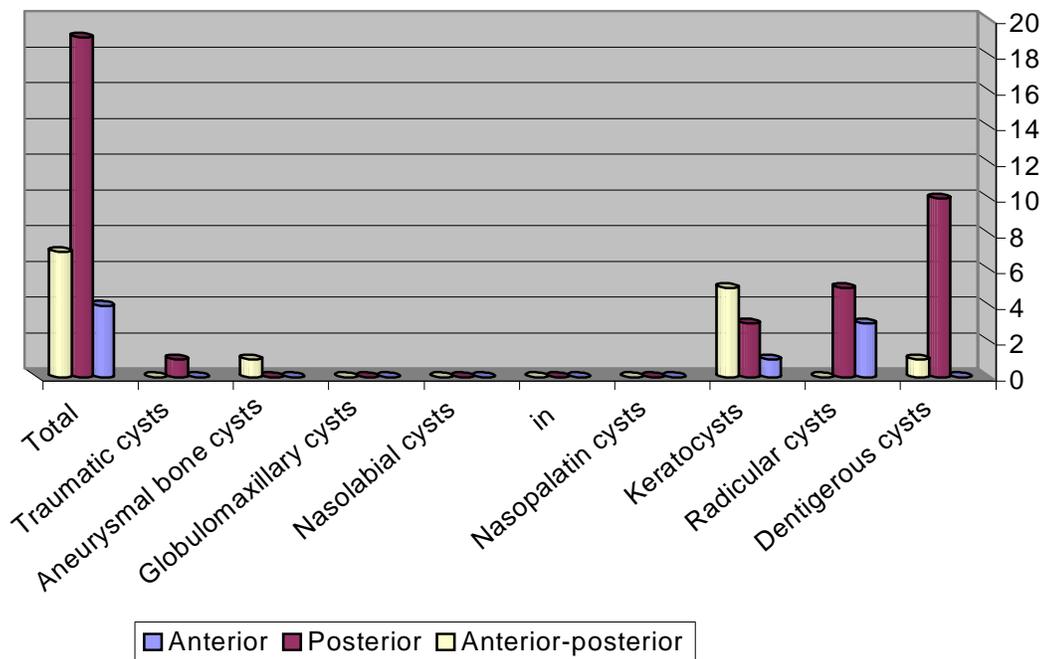


Figure (5)
Type and Site Distribution of 70 patients with jaw cysts in K.D.T.H

Table (6)
Sites distribution of mandibular cysts⁽¹⁾

| Types of cysts | Anterior | Posterior | Anterior-posterior | total |
|------------------------|----------|-----------|--------------------|-------|
| Dentigerous cysts | 0 | 10 | 1 | 11 |
| Radicularcysts | 3 | 5 | - | 8 |
| Keratocysts | 1 | 3 | 5 | 9 |
| Nasopalatin cysts | - | - | - | - |
| Medianpalatin cysts | - | - | - | - |
| Nasolabial cysts | - | - | - | - |
| Globulomaxillary cysts | - | - | - | - |
| Aneurysmal bone cysts | - | - | 1 | 1 |
| Traumatic cysts | - | 1 | - | 1 |
| Total | 4 | 19 | 7 | 30 |



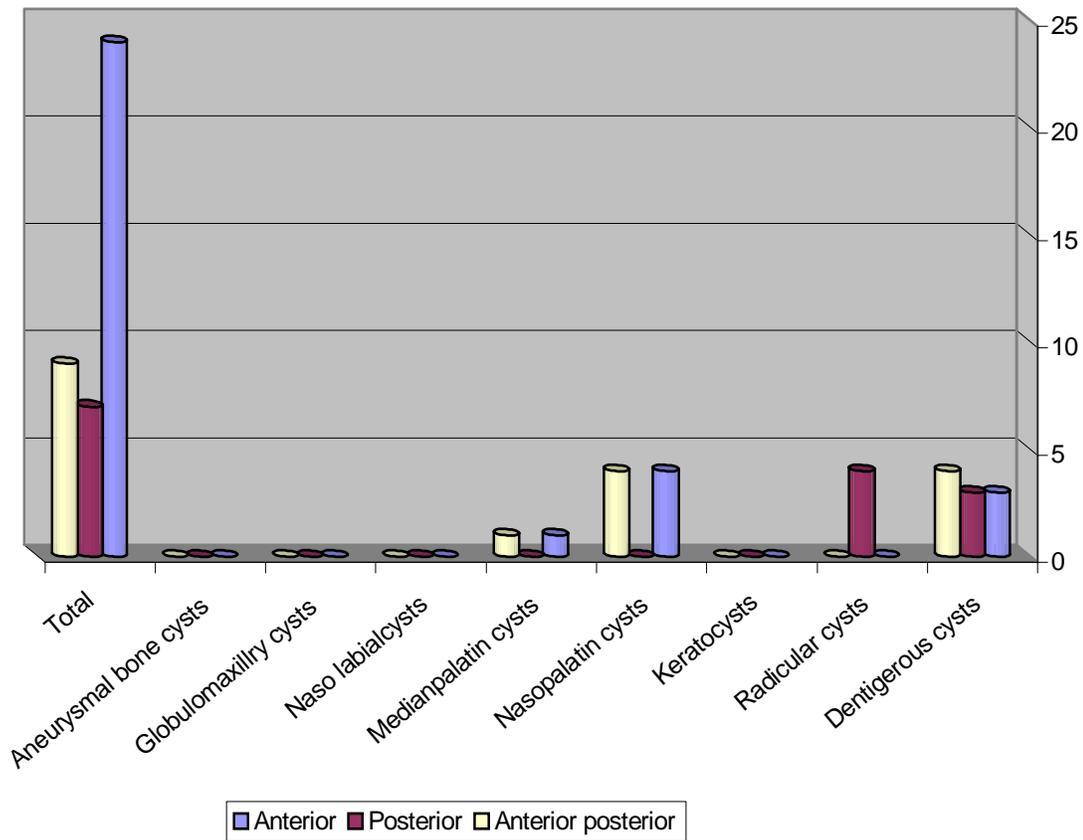
1 - - Anterior region: This region extended from right canine to left canine.
 - Posterior region : This region extended from 1st premolar to third molar.

Figure (6)

Sites distribution of mandibular cysts

Table (7)
Sites distribution of maxillary cysts⁽²⁾

| Types of cysts | Anterior | Posterior | Anterior-posterior | Total |
|------------------------|----------|-----------|--------------------|-------|
| Dentigerous cysts | 1 | 3 | 4 | 8 |
| Radicular cysts | 6 | 4 | - | 10 |
| Keratocysts | - | - | - | - |
| Nasopalatin cysts | 9 | - | 4 | 13 |
| Medianpalatin cysts | 3 | - | 1 | 4 |
| Nasolabial cysts | 3 | - | - | 3 |
| Globulomaxillary cysts | 1 | - | - | 1 |
| Aneurysmal bone cysts | 1 | - | - | 1 |
| Total | 24 | 7 | 9 | 40 |



2- - Anterior region: This region extended from right canine to left canine.
- Posterior region : This region extended from 1st premolar to third molar.

CHAPTER FOUR

4.1. Discussion

Seventy patients with jaw cysts were seen at Khartoum Teaching Dental Hospital in period from October, 2003 to December, 2004, 50 (71.4%) complain of painless swelling, 13 (18.6%) complain of mild toothache, and 7 (10%) were complain of painless swelling with discharge. J. Regezi, 1999 Found that, the most jaw cysts are asymptomatic and are often discovered incidentally during routine dental radiographic examination, also he found the symptoms may follow secondary infection, sinus formation and drainage is not uncommon. Cawson's, 2002 found that, the jaw cysts causes slowly progressive painless swelling with no symptoms until they become large enough to be conspicuous or infection inters, also he found the jaw cyst causes intermittent discharge with a salty taste. Neeliam, 2003 found that the physical signs and symptoms of jaw cysts will depend to a certain extent on the dimensions of the lesion, patients are remarkably free of symptoms until the cysts have reached a large size or become infected, he suggested the patient's may complain of swelling, pain and discharge, the discharge often described as a salty taste. All these studies support our results, the Jaw cysts in general are asymptomatic unless they are large enough or become infected.

The study showed, the jaw cysts incidence were more common in males than females, 42(60%) of jaw cysts were males 28(40%) were females, male to female ratio was 3 : 2. (table 7 and 8).

Radicular cysts were more common in males than females, 18 cases of radicular cysts were seen, 10(55.56%) were males and 8(44.4%) were females , male to female ratio was 2.5 : 2. (table 7). M. Shear's 1988 found that the 388(58%) out of 664 radicular cysts were males and 276(42%) were females. Cawson's, 2002 found, that the radicular cysts are more common in males than females , male to female ratio was 3 : 2. Our result were found to be comparable to result of M. Shear and Cawson's .

Dentigerous cysts were found more common in males than females, among 19 cases reported, 13(68%) males and 6(31.6%) females (table 7). J. Regezi, 1999 found that the dentigerous cyst had a greater frequency in males than females with a ratio 1.6 : 1. Luis Monterio, 2005 found that the dentigerous cyst were more common in males than females among 25 cases of dentigerous cysts reported, 17 (65.4%) were males and 8(34.6) females. Our results and previous studies agree that the dentigerous cysts are more common in males than females.

This study showed that, the keratocysts were common in males than females ,among 9 cases seen, 5(55.5%) were males, and 4(44.4%) were females, male to female ratio was 1.25 : 1. (table 7). Piattellia A Rubini C, 1998, found that, the keratocyst was more evident in males than females with a ratio of 2 : 1. Luis Monterio, 2005 found that the keratocyst was more common in females than males, among 15 cases reported, 8(53.3%) were females and 7(46.7%) were males. Our results were found to be comparable to results of Piattellia A Rubini who found that the keratocyst were more common in males than females, but differ from the result of Luis Monterio, who found that the keratocysts were more common in females than males

Nasopalatine cysts were common in males than females, 13 cases of nasopalatine cysts were seen, 7(53.5%) were males and 6(46.15%)

were females (table 8). M. Shear, 1983, found that the nasopalatin cysts are more common in males than females. 175 cases were reported, 119 (76%) were males and 38(24%) were females. J.Regezi 1999, found that, the males are more frequently affected than females, male to female ratio was 3:1. Our result shows some little difference from the result of M.Shear and J.Regezi.

Medianpalatin cysts were found only in males, among 4 males reported (table 8). Gordon 1980, found 45 cases of medianpalatin cysts only in males. U.Hadi et al 2001, found the males are affected more than females, with a ratio 3 : 1. Our results and Gordon results agree that the medianpalatin cysts were found only in males, but U.Hadi et al found that the medianpalatin cysts occur in males and females with a ratio 3:1.

Nasolabial cysts were more common in females than males, among 3 cases were seen, 2(66.6%) were females and one case (33.3%) was males (table 8). Van Bruggen 1982, found that the nasolabial cysts were common in females than males, he found 155 cases of nasolabial cysts, 119(79%) were females and 32 (21%) were males. J. Regori 1999, found that the nasolabial cysts more common in females than males, a females to males ratio was 4 : 1. These results confirm our finding.

One case of traumatic bone cyst was found in female patient in our study (table 2). Cawson's 1991 found that the females are affected more than males in a ratio of about 3: 2. Prof. Neeliam 2003 found that the males are affected more than females. Our results were found to be comparable to results of Cawson's who found that the traumatic cysts are more common in females, but differ from results of Prof. Neeliam who found that the traumatic cyst are common in males.

In cases of aneurysmal bone cyst, 2 cases were reported, one case was found in male patient and the other one was found in female patient in our study (table 2). M.Shear's 1983 found that the aneurysmal bone

cysts were common in females than males. Cawson's 1991 found that either there are no strong predilection for either sex. J.Regezi 1999 suggested there is a slight female predilection. Though our sample is small but support there is no sex predilection.

According to age distribution, this study showed the mean age of patients seen was 35.5 years, the youngest being 6 years old and the eldest 65 years old, the peak age was between 2nd, 3rd and 4th decade of life (table 9).

Radicular cysts were more frequent on the 2nd and 3rd decade 3 cases were seen on the 2nd decade and 9 cases were seen on the 3rd decade of life (table 9). Denise Guendert 1992, from Jhon kinsella faculty found that the age distribution for patient with radicular cyst was between 20 – 50 years. Luis Monteiro 2005 found that the radicular cysts were more frequent on the 4th the decade. Our results were found to be comparable to results of Denise Gurdert who found that the age distribution for patient with radicular cyst was between 20-50 years and results of Luis Monteiro who found that the radicular cysts were more frequent on the 4th decade.

Dentigerous cysts were more frequent on the 2nd 3rd and 4th decade of life in our study, 8 cases were seen in the 2nd decade, 4 cases on the 4th decade, 3 cases were seen on the 3rd decades of the life (table 9). In Athenai, Ioannido F.Mustafa 1989, found the age distribution for patients with dentigerous cyst was the 2nd decade. Denise Guendert 1992, found the age distribution for patient with dentigerous cysts was the 2nd, 3rd and 4th decade. Our results agreed with results of Denise Guendert, that the age distribution of dentigerous cysts were on the 2nd, 3rd, and 4th decade of life, but there is some difference from the results of Ioamnido F.Mustafa who found that the age distribution of patient with dentigerous cyst was the second decade.

Keratocysts were more frequent on the 2nd, 3rd decade in our studies, 4 cases were seen on the 2nd decade and 3 cases on the 3rd decade of life (Table9). Denise Guendert 1992 found the age distribution for patient with Keratocyst was the 2nd and 3rd decade. Pittelli A 1998, found that the keratocyst can be found at any age, but with a peak incidence in the 3rd and 4th decade of life, our results were found to be comparable to results of Denise and Pittelli A. That appears the age distribution of keratocyst was on the 2nd and 3rd decade of life.

Nasopalatin cysts were more common in the 3rd and 4th decade of life in our study, 5 cases were found on the third decade, and 3 cases on the 4th decade of life (table 9) J. Regezi 1999, found that the majority cases of nasopalatin cyst occur between the 4th and 6th decade, but in Japan Miki Hisatami et al 2001, found that the age distribution for patients with nasopalatine cyst was the 3rd and 4th decade of life. Our results agreed with results of Miki Hisatami that the age distribution of nasopalatin cyst was on the 3rd and 4th decade, but there is some difference from the result of J. Regezi who found that the age distribution of nasopalatin cyst was on the 4th and 6th decade.

Medianpalatin cysts were more found on the 2nd, 3rd and 4th decade, 2 cases were seen on the a third decade and one case was seen on the 2nd and 4th decade of life (table 9). U. Hadi 2001, found the age distribution for patients with medianpalatin cyst was between 20 – 50 years, also. Gigell 1985, found the mean age for patients with medianplatin cyst was 44 years. Our result and previous studies agree that the age distribution for patient with medianpalatine cyst was the 2nd, 3rd, and 4th decade of life.

Nasolabial cysts were common on the 2nd and 3rd decade of life in our study, 2 cases were seen on the 3rd decade and one case on the 2nd decade of life (table 9). M.Shear's1983, found that the age distribution for

patients with nasolabial cyst was 3rd and 4th decade, J. Regozi 1999, found that the peak age incidence of nasolabial cyst was the 4th and 5th decade of life. There is some differences between our findings and these results which found that the age distribution of nasolabial cyst was on the 2nd, 3rd, and 4th decade of life.

In cases of traumatic cysts, only one case was reported on the 2nd decade of life in our study (table 9). Cawson's 1991 found that the traumatic cysts are mostly seen in teenagers, and are rare after the age 25. Killey and Kays 1992 found that the traumatic bone cysts are found most often in the first, second and third decade our results and previous studies agree that the traumatic cysts are mostly found in the young adults.

Two cases of aneurysmal bone cysts were found in the first and the second decades of life (table 9). M.Shear's 1983 found that the age distribution of patients with aneurysmal bones cysts were in the first three decades of life. J Regezi 1999 found that the aneurysmal bone cysts typically affects persons younger than 30 years. Vitrtoria Perrotti et al 2004 found that the average of aneurysmal bone cysts incident was 13 years, and 80% of patients are less than 20 years old. These results confirm our finding that the age distribution of patient with aneurysmal bone cysts were the 1st, 2nd, and 3rd decades of life.

According to types of cysts, this study showed that the 19 cases (27.14%) out of 70 cases of jaw cysts were dentigerans cysts, 18 (25.7%) radicular, 9 (12,86%) kertocysts, 13 (18.57%) nasopalatin cysts, 4 (5.71%) medianpalatin cyst, 3 (4.29%) nasolabial cysts, one case (1.43%) globulomaxillary cyst, 2 (2.86%) aneurysmal bone cysts and one case (1.43%) was traumatic cys (table 2). Icteno. Sayan 1990, from Ankara university found 15 cases of Jaw cysts, 5 cases were nasopalatin cysts, 2 were medianpalatine cysts, one case was globulomaxillary cysts, 4 were aneurysmal bone cyst, 2 were medianmandibulr cysts and one was

traumatic bone cyst. Ojic in Nigeria 1999, found that the distribution of jaw cyst according to types as the following: 10 cases (50%) were dentigerous cysts, 3(15%) radicular cysts, 3 (15%) keratocysts, 3 (15%) fissural cysts (nasopalatin, nasoalveolar, globulomaxillary cyst). Prof. Tomio Makajima in School of Dentistry at Niigata university found that, the radicular cysts showed the highest incidence (49.3%) followed by dentigerous cysts (13%) nasopalatine cysts (3.8%) and simple bone cyst (2.3%). Lipa Bodner 2002, found that the distribution of jaw cysts according to types as the following: radicular cysts (55%), dentigerous cysts (17%), nasopalatin cysts, (12%) primordial cyst (11%) globulomaxillary cyst (1.3%) and traumatic bone cyst (0.7%).

In this study, dentigerous cysts were the most common types of jaw cysts (27.14%) followed by radicular cysts (25.7%), nasopalatin cysts (18.57%), keratocysts (12.86%), medianpalatine cyst (5.71%) nasolabial cyst (4.29%) aneurysmal bone cyst (2.86%) globulomaxillary cyst (1.43%) and traumatic cyst (1.43%) (table 2). Our results were found to be comparable to results of Ojic in Nigeria who found that the dentigerous cysts were the most common types (50%) followed by radicular cysts (15%), keratocyst (15%), but there is some differences with results of Tomio Makajima, who found that, the radicular cysts were the most common types (49.3%) followed by dentigerous cyst (13%), nasopalatin cyst (3.8%) and simple bone cyst (2.3%).

According to common sites of jaw cysts, 19 cases of dentigerous cysts were reported, 10 cases were located on the posterior part of the mandible, 4 cases on the anterior posterior part of the maxilla, 3 cases on the posterior region of the maxilla and one case on the anterior part of the mandible and the maxilla (table 5 & 6). Denise Guendert 1992, found that the dentigerous cyst usually found in the mandible in the third molar region. Canine area was the most common site in the maxilla. Francis B.

Quinn in 2002 found that the dentigerous cyst was located in the mandibular third molars, maxillary canines and maxillary third molars. Luis Monteiro 2005, found that the most frequent location of dentigerous cyst was the mandible, mainly in the posterior sector. Our results and previous studies agree that the common side of dentigerous cyst was mandibular third molars, maxillary canines and maxillary third molars.

Eighteen cases of radicular cysts were found, 6 cases were located on the anterior region of maxilla, 5 cases on the posterior region of the mandible, 4 cases on the posterior region of the maxilla and 3 cases on the anterior region of mandible (table 5 & 6). Denise Guendert 1992, found the highest location of radicular cyst in anterior maxilla, followed by posterior mandible, maxillary central incisor the most common site. In Japan, Nakamura T, Ishida 1995, found that the radicular cyst occurred most frequently in the maxillary lateral incisor. J. Regezi 1999, found that the radicular cysts were located in the maxilla, especially on the anterior region, followed by posterior region of the maxilla, posterior region of the mandible and finally the anterior region of the mandible. All these study confirm our finding.

Nine cases of nematocysts were found, 5 cases were located on the anterior-posterior region of the mandible, 3 cases on the posterior region of the mandible, and one case was located on the anterior region of the mandible (table 5 & 6). In Japan, Nakamura T. ishida 1995, found the common site of keratocyst was the region between the mandibular premolars and the ramus. Luis Monteiro in 2005, found that the most location of keratocyst was the mandible, mainly in the posterior sector. Our results were found to be comparable to results of Nakamura T, ishida and Luis Monterio who found that the common site of keratocysts were posterior region of mandible between the premolar and ramus.

Thirteen cases of nasopalatin cysts were reported, 9 cases were located on the anterior region of the maxilla between the two maxillary central incisors, and 4 cases extended to the premolar region (table 5& 6) J. Regezi 1999, found, that the nasopalatin cyst located within the palatal soft tissue at the point of the opening of the canal. Francis B.Quinn 2002, suggested the nasopalatin duct cyst was located between and apical to the two maxillary central incisor in the midline of the maxilla. There is no difference between our findings and results of J. Regezi and Francis B. Quinn.

Four cases of medianpalatine cysts were reported, 3 cases were found in the anterior region of the maxilla and one case extended to the premolar region. (table 5 & 6). U.Hadi et al 2001, found, the common site of medianpalatin cyst was the midline of the maxilla for back from the incisive canal or nasopalatin duct. Prof. Neeliam 2003, found the most common site of medianpalatin cyst was hard palate between the incisive fossa and the posterior border of the hard palate. Our results were found to be similar to results of U.Hadi et al and Prof. Neelian.

In cases of nasolabial cyst, 3 cases were seen on the anterior region of the maxilla over the canine region (tabe 5 & 6). Prof. Neeliam 2003, found the site of nasolabial cyst was above the buccal sulcus under the ala of the nose. M.Shear's 1983 found that the nasolabial cyst occurs outside the bone in the nasolabial folds between the allae nasi. J. Regezi 1999 found that the nasolabial cyst is located in the soft tissue over the canine region or the mucobuccal fold. There is no difference between our findings and results of Prof. Neeliam, M.Shear's and J. Regezi.

Two cases of aneurysmal bone cysts were reported one case was found in the posterior region of the mandible and extending to anterior

region and the other one was located in the anterior region of the maxilla (table 5 & 6). Prof. Neeliam 2003, found that the aneurysmal bone cyst was located in the posterior region of the mandible. Vittoria Perrotti in 2004 found that the aneurysmal bone cyst occur most frequently in the body of the mandible, followed by the ramus and angle of mandible. Our results and previous study agree that the common site of aneurysmal bone cysts was the posterior region of the mandible.

Traumatic cysts in this study was very rare, only one case was seen and located in the posterior region of the mandible between the first premolars and third molars (table 5 & 6). Beasley 1976, found that the traumatic bone cyst occurs mostly in the premolar and molar regions of the mandible above the inferior dental canal. Prof. Neeliam in 2003 found that the majority of traumatic cysts were seen in the subapical region above the inferior dental

canal in the premolar and molar region of the mandible. All these results support our results that the traumatic cyst was located in the posterior region between the first premolars and third molars.

4.2. Conclusion:

- During this study which carried out at Khartoum Teaching dental Hospital in period from October, 2003 to December, 2004, 70 patient's of jaw cysts were seen. The chief complain was painless swelling in 50 cases (71.4%), mild toothache in 13 (18.6%) and painless swelling with discharge in 7 (10%).
- The 70 patient's were almost fall in the range of 6-65 years, the mean age was 35.5 years. 2 cases were found on the 1st decade, 20 cases on the 2nd decade, 25 cases on the 3rd decase, 9 cases on the 4th decade, 4 cases on the 5th decade and 5 cases were found on the 6th decade of life.
- Jaw cysts incidence are more common in males than females, 42 (60%) were males and 28 (40%) were females, males to females ratio was 3:2.
- The most common type of jaw cysts were odontogenic cysts 46 (65.7%) followed by non-odontogenic cyst 21 (30%) and pseudocyst 3 (4.29%). Of the odontogenic cysts, dentigerous cysts were the common type 19 cases (27.14%) followed by radicular cysts 18 (25.8%) and keratocyst, 9 (12.85%). Of the non-odontogenic cysts, nasopalatin cyst were the common type ,13 cases (18.57%) followed by medianpalatin cysts 4 (5.71%), nasolabial cysts 3 (4.29%) and globulomaxillary cysts, one case (1.43%). Of the Pseudocyst, 2 cases (2.86%) were aneurysmal bone cysts and one case (1.43%) was traumatic cyst.
- The common sites of dentigerous cysts were posterior par of the mandible (11 cases), and posterior part of the maxilla (7 cases), while the common sites of keratocysts were the posterior-anterior region of the mandible (8 cases), but the common sites of radicular

cysts were anterior part of the maxilla (6 cases), posterior part of the mandible (5 cases) posterior part of the maxilla (4 cases) and anterior part of the mandible (3 cases). Of the non-odontogenic cysts (fissural cysts). The anterior part of the maxilla between right and left canines were the common sites, but some cases extended to the premolars area. Of the Pseudocysts (aneurysmal bone cysts and traumatic cyst) the posterior part of the mandible between the premolars and lower third molars were the common sites, but some cases extended to the ramus.

- Finally, our results were found to be comparable to international literature review except the following:-
 - Dentigerous cysts, in our study were the first common type of odontogenic cysts, while in international literature review, dentigerous cyst was the second most common of odontogenic cyst.
 - Radicular cysts in our study were the second type of odontogenic cysts, but in international literature review, radicular cysts was the first most common odontogenic cysts.
 - These differences may be due to the small sample

4.3. Recommendations:-

- Jaw cysts should be treated in early stage to avoid the complications such as infection, pathological fractures and to avoid malignant transformation.
- Aspiration is useful test to confirm the radiological finding and distinguish between jaw cysts and other swelling in the jaw bones. The aspiration should be covered with antibiotic to avoid post aspiration infection.
- Root canal filling should be done for all associated teeth before operation for not to lost teeth.
- Follow up is important to evaluation the conditions clinically and radiographs.

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Faculty of dentistry

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Questionnaire sheet for incidence of jaw cysts

- 1- Date: _____ No: _____
2- Name: _____
Age: _____
3- Address: _____ Gender: _____ Phone No: _____
4- Chief Complaint: _____

5- Clinical Examination: -

a) Extra oral Examination: _____

b) Intra oral Examination: - _____

6- Radiographic Examination: -

a) Periapical X-Ray Film: _____

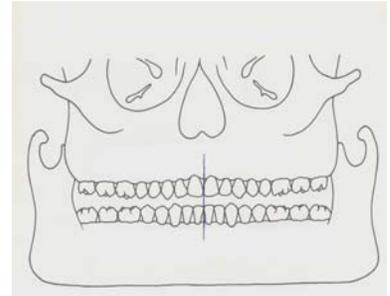
b) Occlusal X-Ray film: _____

c) Panoramic (OPG) X-Ray film: - _____

d) Cyst size : _____

e) Cyst Site _____ | _____

7- Definitive diagnosis: -



By:

Supervisor: -

Ali Ali Alzamzami

