الآية

قال تعالى

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و قال تعالى

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Dedication

I dedicate this effort to my mother, my father, brother, sisters, and my small family (my husband and lovely kid's Leen and yomna).

Continuously hope and praying to keep them well.

Acknowledgment

I would like to thank much more my god who helps me to complete this work.

I would like to deep thanks, acknowledge the guidance and efforts to my supervisor Dr. Mohamed Mohamed Omer for his advice, encouragement and supports.

I would like to thanks my colleges in sharg alnile hospital special thanks to ostaz : Mohmed Abdalsalam and Abdalla Mustafa.

Special thanks to my husband who help and support me continuously.

Finally I would like to thanks my father and mother for supporting and continuous praying.

Abstract

This study was aimed to evaluate PNS diseases a by using CT (Computed tomography) and to evaluate the common disease affecting the PNS (Para nasal sinuses).

It was conducted in Royal diagnostic center in the period from (June to November 2015), 47 Pt. in different ages and gender whom suspected of having PNS disease

The results were Showed that the PNS disease is common ,the disease of chronic sinusitis had higher frequency 26%, the bilateral pathological lesion had higher frequency 55% ,and the common site is maxillary sinuses 83% .the range of age (15 -30) years had higher frequency32% more in female than the male 55%.

Finally the Study finding that the MDCT is more effectively in PNS diseases.

ملخص البحث

الهدف من الدراسة تقييم دور الاشعة المقطعية في امراض الجيوب الانفية.

تمت الدراسة في مركز رويال اسكان التشخصي في الفترة من يونيو الى نوفمبر 2015 و تمت الدراسة على 47 مريض من فئات عمريه مختلفه .

نتائج الدراسة أوضحت ان اكثر الامراض شيوعا هي التهابات الجيوب الانفية المزمنة بنسبه 26% واكثرها في الجانبين من الوجه بنسبه 55% و اكثر الجيوب اصابه بالامراض هي الجيوب الاماميه بنسبه 83% واكثر الاعمار المتاثرة هي الفئه العمريه من (15-30) سنه بنسبه 32% واكثر المصابين هم من الاناث بنسبه 55% .

ووجدت الدراسة ان الاشعة المقطعية هي افضل وسيلة للتشخيص .

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List of Abbreviation

CT : computed tomography

PNS : para nasal sinuses

MDCT : multi detector computed tomography

OMU : osteo meatel unit

SSS : silent sinus syndrome

ACP : antro choanal polyb

CSF : cerebro spinal fluid

URP : upper respiration tract

SPSS : statistical package of social science

FIG : figure

B/W : between

L : liter

FESS : Functional Endoscopic Sinus Suergery

NE : Nasal Endoscopy

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Chapter one

Introduction

1.1 Introduction:

The paranasal sinuses are air-filled spaces located within the bones of the skull and face. They are centered on the nasal cavity and have various functions, including lightening the weight of the head, humidifying and heating inhaled air, increasing the resonance of speech, and serving as a crumple zone to protect vital structures in the event of facial trauma. Four sets of paired sinuses exist: maxillary, frontal, sphenoid, and ethmoid, they are communicate with nasal cavity through small apertures (ostia). (Dalgorf DM 2013).

Medical Imaging has experiences significant change in both technologic and Clinical aspect in evaluation of PNS Abnormalities Computed tomography (CT) is an excellent means of providing anatomical information of this region, assessing disease extent, assisting endoscopic evaluation and guiding treatment.

CT scan provides excellent contrast resolution, high spatial resolution and produce images in three dimensions reconstruction Images, Ct is ideal

Method to evaluate the bony changes and integrity of the bony margins of the PNS wall.

CT is superior than plain X-ray in defining the extension and potential complication of the PNS diseases and are essential for therapy planning its also capable to define the ostia of PNS and identify possible outflow obstruction. By CT Scans its can easily obtain images in coronal planes and axial plane thin slice. Coronal is ideal for detecting the PNS diseases and displays the OMU and The relationship of the sinus lesion to the orbits and the brain.

Axial planes are important in the evaluation of trauma and neoplasm of PNS and evaluation of inflammatory changes in PNS.

1.2 Problem of the study:

Most PNS examinations done with conventional X-ray such as Water and Caldwell views didn't provide sufficient Clinical Diagnosis.

Conventional CT is not capable to reconstruct the images in coronal planes, unlike spiral CT its can Provide MPR (axial, Coronal, Sagittal) and 3rd Images of the PNS.

1.3 Objectives:

1.3.1: General objectives:

To find out the role of MDCT in evaluation of PNS abnormalities .

1.3.2: Specific Objectives:

To determine the most common abnormalities affecting the PNS.

To determine the most affected site and side of PNS.

To relate b/w age, gender and abnormalities.

To relate b/w abnormalities and the site .

To put keystone for more future studies.

1.4: Significance of the study:

This study provide Information about detection of PNS abnormalities by Multi-detector CT.

1.5: Overview of the study:

This study is consist of five chapters, chapter one is deal with the introduction, problem of the study, objectives, Chapter 2 include Anatomy, physiology & pathology and previous studies

Chapter three deals with materials and methods then Chapter four present the result and chapter five the discussion, conclusion, recommendation, References and appendices.

1.6: Justification:

To find out that CT is the method of choice to evaluate the PNS abnormalities .

To improve the health conditions of the patients and obtain good Images that can be diagnosable.

Chapter Two

Literature review

2.1: Anatomy of PNS:

The paranasal sinuses are air filled extensions of the respiratory part of the nasal cavity. There are four paired sinuses, named according to the bone they are located in; maxillary, frontal, sphenoid and ethmoid.

The function of the sinuses is not clear. It is thought that they may contribute to the humidifying of the inspired air. They also reduce the weight of the skull. (Dalgorf DM, Harvey RJ.2013).

Sinuses are formed in childhood by the nasal cavity eroding into surrounding bone. As they are outgrowths of the nasal cavity, they all drain back into it – openings to the paranasal sinuses are found on the roof and lateral walls of the nasal cavity. The inner surface is lined by a respiratory mucosa. Composed of:

2.1.1: Frontal Sinuses:

These are the most superior in location, found under the forehead. The frontal sinuses are variable in size, but always triangular shaped. They drain into the nasal cavity via the frontonasal duct, which opens out at the hiatus semilunaris on the lateral wall. (Dalgorf DM, Harvey RJ.2013).

2.1.2: Sphenoid Sinuses:

The sphenoid sinuses also lie relatively superiorly, at the level of the spheno-ethmodial recess. They are found more posteriorly, and are related superiorly and laterally to the cranial cavity. The sphenoid sinuses drain out onto the roof of the nasal cavity. The relationship of this sinus are of clinical importance – the pituitary gland can be surgically accessed via passing through the nasal roof, into the sphenoid sinus and through the sphenoid bone.(Keros P.1965.)

2.1.3: Ethmoidal Sinuses:

There are three ethmoidal sinuses; anterior, middle and posteior. They empty into the nasal cavity at different places:

- Anterior – Hiatus semilunaris
- Middle – Ethmoid bulla
- Posterior – Superior meatus

2.1.4: Maxillary Sinuses:

The largest of the sinuses. It is located laterally and slightly inferiorly to the nasal cavities. It drains into the nasal cavity at the hiatus semilunaris, underneath the frontal sinus opening. This is a potential pathway for spread of infection – fluid draining from the frontal sinus can enter the maxillary sinus.(Reddy UD, Dev B.2012).

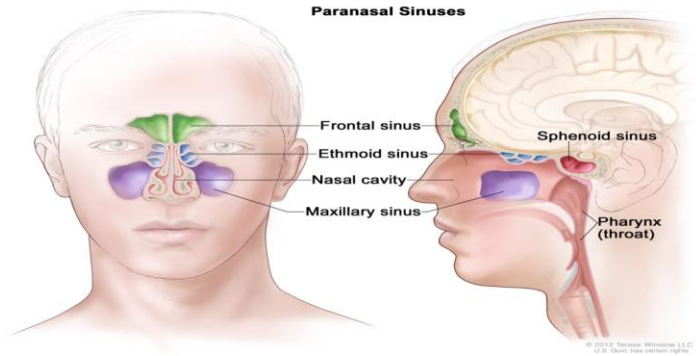

Figure 2.1: Paranasal Sinuses

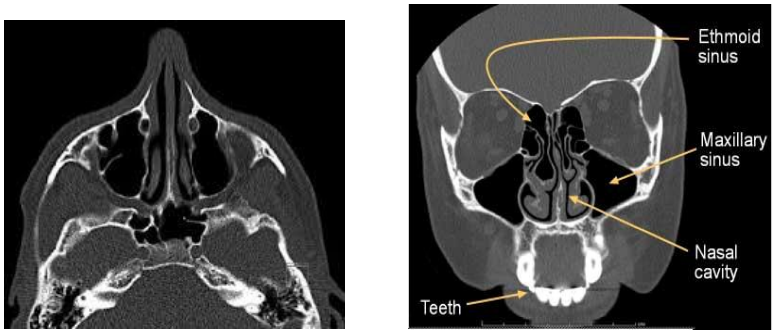

Figure 2.2: Paranasal Sinuses

2.2: Physiology OF PNS:

The main functions of the paranasal sinuses are:

- giving vibration or resonance to the voice
- reducing the weight of the bones of the face
- give strength and shape to the face and eyes

The nasal cavity and paranasal sinuses make about 1 L of mucus a day. As the mucus moves through the nasal cavity and sinuses, it moisturizes and cleans the mucous membrane, which filters bacteria, dust and other particles from the air breathed through the nose. The mucus drains into the throat and is swallowed, where the acid in the stomach destroys any bacteria that were in the mucus.

2.3: Pathology of PNS:

2.3.1: Sinonasal disease:

The nasal passage and paranasal sinuses (collectively sinonasal) plays host to a number of diseases and conditions, which can be collectively termed sinonasal disease. One way of classifying separate entities is as follows:

inflammatory and infective conditions

sinusitis

acute sinusitis

chronic sinusitis

fungal sinusitis

granulomatosis with polyangiitis (formerly known as Wegener granulomatosis)

masses and neoplasms

sinonasal polyposis

inverted papilloma

antrochoanal polyp

sinonasal tumours

sinonasal carcinoma

sinonasal undifferentiated carcinoma

sinonasal mucosal melanoma

sinonasal lymphoma

mucocoele

silent sinus syndrome

2.3.2: Sinonasal inflammatory:

disease with sinus ostial obstruction is a very common cause of an opacified paranasal sinus. An air-fluid level suggests acute sinusitis; in chronic sinus disease, one may see mucosal thickening and sclerosis of the bony sinus walls.1 The sinus is normal in size. There are certain recurring patterns of inflammatory sinus disease that may be seen on sinus computed tomography. These include: the infundibular pattern, with inflammation of the maxillary sinus and opacification of the ipsilateral ostium and infundibulum; the ostiomeatal unit pattern, with inflammation of the ipsilateral maxillary, frontal and ethmoid sinuses and occlusion of the middle meatus the sphenoethmoidal recess pattern, with obstruction of the sphenoethmoidal recess and inflammation of the ipsilateral posterior ethmoid and sphenoid sinuses.(Lev MH, Groblewski JC, Shortsleeve CM, Curtin HD.1998).

2.3.3: Neoplasm:

Malignant sinonasal neoplasms comprise 3% of all head and neck neoplasms. Squamous cell carcinoma accounts for 80% of sinonasal malignancy, arising most frequently in the maxillary sinus (25-63%), and less frequently in the nasal cavity (15-35%), ethmoid sinus (10-25%) and least frequently in the frontal and sphenoid sinuses (1%). Presenting

symptoms of sinonasal malignancy can be identical to those caused by inflammatory sinus disease.(Madani G 2009).

2.3.4: Mycetoma:

Mycetoma, also known as a "fungus ball," is a manifestation of fungal sinus disease. Fungal sinusitis is broadly categorized as invasive or noninvasive, with five major subtypes. The noninvasive subtypes typically occur in immunocompetent individuals and include mycetoma and allergic fungal sinusitis. Acute invasive fungal sinusitis, chronic allergic fungal sinusitis and chronic granulomatous fungal sinusitis constitute the invasive subtypes. The absence of hyphae with the mucosa, bone and blood vessels characterizes noninvasive fungal sinusitis, while invasive fungal sinusitis is defined by the presence of hyphae within the mucosal and submucosal tissues, bone and blood vessels of the paranasal sinuses. Clinical symptoms of mycetoma are either absent or minimal.

The mycetoma represents a densely packed collection of fungal hyphae with no allergic mucin. It appears as a hyperdense mass with internal calcifications within the sinus on unenhanced CT the inflamed mucosa peripherally may be hypodense. The mycetoma tends to involve a single sinus, most commonly the maxillary, with the sphenoid sinus affected less

frequently. The bony walls may be thickened and sclerotic or expanded and thin.

2.3.5: Ameloblastoma:

Ameloblastoma is the most common odontogenic tumor. Defined as a benign epithelial neoplasm, the tumor is locally aggressive and invasive. Incomplete resection may result in local persistence or recurrence or, rarely, distant typically pulmonary metastases. Interestingly, approximately 50% of ameloblastomas arise from the lining of a dentigerous cyst.

A unilocular ameloblastoma may be difficult to distinguish from a dentigerous cyst; the presence of a small intracystic mural nodule, seen in ameloblastoma, is helpful in differentiation.

Like dentigerous cysts, ameloblastomas occur much more commonly in the mandible than the maxilla; only 20% of ameloblastomas occur in the maxilla.

The premolar-first molar location is common for a maxillary ameloblastoma. These maxillary tumors then easily expand into the ipsilateral antrum or the adjacent nasal cavity(Madani G 2009).

2.3.6: Dentigerous cyst:

Both dentigerous cysts and ameloblastomas originate in the bony maxilla and may then secondarily involve the adjacent maxillary sinus.

The dentigerous cyst is the most common type of a developmental odontogenic cyst. They are typically solitary, and 75% of lesions are located in the mandible. They may be associated with any unerupted tooth, but most commonly with the mandibular third molars. The maxillary canines and maxillary third molars are involved less frequently. A dentigerous cyst that involves a paranasal sinus usually is related to a maxillary canine, with secondary extension into the antrum . (Ustuner E,Fitoz S 2003) .

2.3.7: Choanal polyp:

A choanal polyp is a benign solitary sinonasal mass that originates in a paranasal sinus and secondarily extends into the nasal cavity. The most common type is the antrochoanal polyp, which originates in the mucosa of the maxillary sinus or antrum. The polyp opacifies and slightly enlarges the sinus cavity with no bone destruction. The enlarged antral polyp protrudes through the maxillary infundibulum or accessory ostium into the middle meatus and then the posterior choana, with possible extension into the posterior nasopharynx. Antrochoanal polyps are rarely bilateral.

Sphenochoanal and ethmoidochonal polyps are less common than antrochoanal polyps. A sphenochoanal polyp begins within the sphenoid sinus and extends through an enlarged sphenoid ostium into the sphenoethmoidal recess and from there into the choana. The sphenochoanal polyp typically lies between the nasal septum and the middle turbinate this space is clear with antrochoanal polyps(Forsini P ,Picarella(2009).

2.3.8: Antrochoanal polyp:

Antrochoanal polyps (ACP) are solitary sinonasal polyps that arises within the maxillary sinus but passes through and enlarges the sinus ostium and posterior nasal cavity to the nasopharynx .

2.3.9: Sinonasal polyposis:

Sinonasal polyposis is a typically extensive process with involvement of both the nasal cavity and the paranasal sinuses. By contrast, mucous retention cysts are typically limited to the sinus cavity in location. CT findings of sinonasal polyposis include polypoid masses in the nasal cavity, polypoid soft tissue masses in the sinuses, partial or complete pansinus opacification, and enlargement of the infundibula.

2.3.10: Mucocele:

By definition a completely opacified, nonenhancing and mucus-filled expanded sinus, a mucocele is the most common expansile mass of a paranasal sinus . Most often secondary to an obstruction of the sinus ostium, mucoceles may also result from surgery, osteoma or prior trauma; this is especially true of frontal sinus mucoceles.10 The frontal sinuses are most frequently affected (60-65%), followed by the ethmoid (20-30%), maxillary (10%) and sphenoid (2-3%) (SHkoukani MA 2013) .

2.3.11: Cephalocele:

A cephalocele is a protrusion of intracranial contents through a defect in the calvarium or skull base; the defect may be congenital, acquired (including postoperative or post-traumatic) or spontaneous. The protrusion is termed a meningocele if it contains meninges and cerebrospinal fluid (CSF) and a meningoencephalocele or encephalocele when it also contains brain tissue.

2.3.12: Silent sinus syndrome (SSS):

Both silent sinus syndrome (SSS) and the mucocele, which is discussed in the next section, are characterized by abnormal sinus size, with reduced sinus volume in SSS and sinus expansion in mucocele.

The term “silent sinus syndrome” is characterized by unilateral progressive painless enophthalmos, hypoglobus and facial asymmetry due to chronic maxillary sinus atelectasis .(IIner A 2002) .

2.4: previous studies:

1) Sheetal D et al. in 2011 conducted a study to correlate between CT findings and endoscopic findings in FESS. This was a time bound cross sectional study design. 45 patients with chronic rhinosinusitis underwent pre operative CT paranasal sinuses ,followed by functional endoscopic sinus surgery (FESS).In this study , the uncinate process attachment, the agger nasi,cells and the, anterior and posterior ethmoid sinuses showed excellent correlation .The maxillary sinus did not show good correlation, but this was acceptable. Most of the anatomical abnormalities can be studied on by CT scan and it is mandatory as a pre operative work up in patients who have to undergo FESS.

2)R. Zojaji MD.et al. in 2008 conducted a study on paranasal sinus CTs of 51patients aged between 15 and 77 who subsequently underwent FESS for chronic rhinosinusitis at two training hospitals during a 2-year period, was performed. They concluded that , combined sinus endoscopy and CT can be considered complementary techniques for effective demonstration of nasal anatomy and paranasal sinuses . CT would be more specific for the assessment of paranasal sinuses and can serve as an anatomic map for the surgeon.

3) A M M Shahizon,et al in 2008 conducted a cross sectional study of 40 patients diagnosed with chronic rhinosinusitis using nasal endoscopy , and on computer tomography (CT) of the paranasal sinuses. The purpose of the study is to demonstrate the effectiveness and limitations of CT, and NE in the assessment of chronic rhinosinusitis. This study shows that CT was superior in detecting OMC involvement, presence of concha bullosa, paradoxical turbinate and nasal septal deviation.

4) Dua K et al. in 2006 conducted a study on all patients undergoing functional endoscopic sinus surgery. Fifty patients of chronic sinusitis were evaluated by CT Scan PNS - coronal and axial views. The anatomical variations and changes in osteomeatal complex on CT Scan were studied. In majority of patients, osteomeatal complex and anterior ethmoids were involved (88%). Agger nasi cells (40%) were the most common anatomical variations followed by concha bullosa (16%). Apart from this deviated nasal septum was found in 44% of patients. The variations found on CT Scan were later confirmed on nasal endoscopy. All the patients then underwent endoscopic sinus surgery.

5) Awaida et al. in 2003 conducted a study on four-cut sinus computed tomographic scanning in screening for sinus diseases. They conducted a retrospective case series. From the complete sinus CT scan, the limited

series were obtained by blocking from view all the other cuts and leaving the radiologist only four slices to read (midfrontal, anterior maxillary sinuses, posterior maxillary sinuses, and midsphenoidal).

The complete CT scan was the "gold standard. They observed 81.3% sensitivity, 89.5% specificity, a 73.9% negative predictive value, and a 92.9% positive predictive value for the limited CT scan for the detection of sinus disease.

6)Fujimoto et.al (1999) they studied: patient with total blindness caused by P.N.S disease have rarely been reported. During the past ten years they are identifical 17 patient with optic nerve disease and posterior P.N.S disease, 7 of 17 had no light perception . 5 of these 7 had a final visual acuity of 20/200 or better, 2patient showed dramatic visual improvement after end nasal surgery C T should be done at the patient first visit.

7)- Laryngoscope(1991) studied CT analysis for para nasal sinuses bone anatomic variation and mucosal abnormalities and result that : coronal plane CT scanning has aromatically improved the imagery of P.N.S anatomy as compared to sinus radiographies.

8)- AJNR 1986: Studied incidental P.N.S abnormalities on C T of children , and result that the P.N.S were prospectively evaluated by CT clinical history

and physical examination in infants having cranial CT for indications unrelated to upper respiration inflammation (URI).

18% of patient older the 1 year without signs or symptoms. The incidence of abnormalities was 31% maxillary antral were not identifable on were pacifically in 72% of all infants under 1 year old.

9)- (J F Linn el al 2007) Studied prospective analysis of incidental P.N.S a abnormalities on C T scans and result that : J. Pediatr 2011) Studied the clinical progression of incidental tomography finding in P.N.S of a symptomatic individuals and result that (56%) of the 106 Pt enrolled in the study had opacity, the majority due mucosal thickening intense opacification was found (suspected) score ≥ 15 and patient in this subset had a greaten risk of developing symptoms during follow up (oddsnatio = 2.74. 95% ci 1.10 – 6.83) compared to those with no findings on discrete findings.

10)- (olackan – 2013) studies incidental P.N.S. abnormality on coronal C T in a valerian population and result that : Total of 100 P t consist of 63 males and 37 females with age range of 11 - 76 years mucosal abnormality was commonest in anterior ethnocide 34% . Maxillary antrum (30%) frontal sinuses (13%) posterior ethomide(12%) and in sphenoid sinuses (11%) he correlated with symptomatic assessment- 27% has sinuses opacification.

The study illustrates the importance of careful clinical correlation when interpreting C T scan of P.N.S.

11)- (Rege etal 2012) Studied occurrence of maxillary C T in a symptomatic patients and result that abnormalities were diagnosed in 68.2% of cases.

There was a significant difference between genders (P≤ 0.001) and there was no difference in age groups, mucosal thickening was most prevalent (66%) followed by retention cysts (10.1%) and opacification (7.8%).

Chapter Three

Materials and Methods

3.1 Materials:

3.1.1 Machine used:

Toshiba 64 slices, spiral CT scanner in Royal diagnostic Center.

3.1.2 Patient:

47 Patient (21 male,26 female) their age is between (10-70).

Whom suspected of PNS pathologies were referred to CT department center.

3.2 Methods:

3.2.1 Technique:

The pt should wear comfortable , loose-fitting clothing to your exam , you may be given a gown to wear during the procedure , metal object including jewelry , eyeglasses , hairpins should be removed prior the exam .. if the contrast agent is request the pt must be fasted 4-6h before the exam . asked pt don't move during the scan .pt should be lying supine with the head in axial head holder, scan should be parallel to the OML. The gantry was tilted (0-10) degree, we use (3-5) mm slice thickness should be taken forward the entire face. We use 2000-2500 HU window width ,200-350 HU window

level, this provides details of bone and soft tissues on a single set of film . straps and pillows may be used to maintain the correct position and to hold still during the exam when the examination is completed, you will be asked to wait until the technologist verifies that the images are of high enough quality for accurate interpretation. We use post processing reformat for further views in different plane (coronal and sigittal) from the axial projection.

3.2.2 image interpretation:

all axial and coronal were evaluated by technologist and diagnosed by radiologist.

3.3 Data analysis:

The data were collected by using questionnaire and medical reports ,and were analyzed by using Statistical Package Of Social Science(SPSS).

Chapter Four

The Results

4.1: The Results:

The study was done according to gender, ages, clinical diagnosis, side of lesion, site of lesion .the result obtained as the following.

The gender distribution as follow, 21 male (45%), 26 female (55%).

Table 4.1 show the gender Distribution

Gender	Frequency	Percent
Male	21	45%
Female	26	55%
Total	47	100%

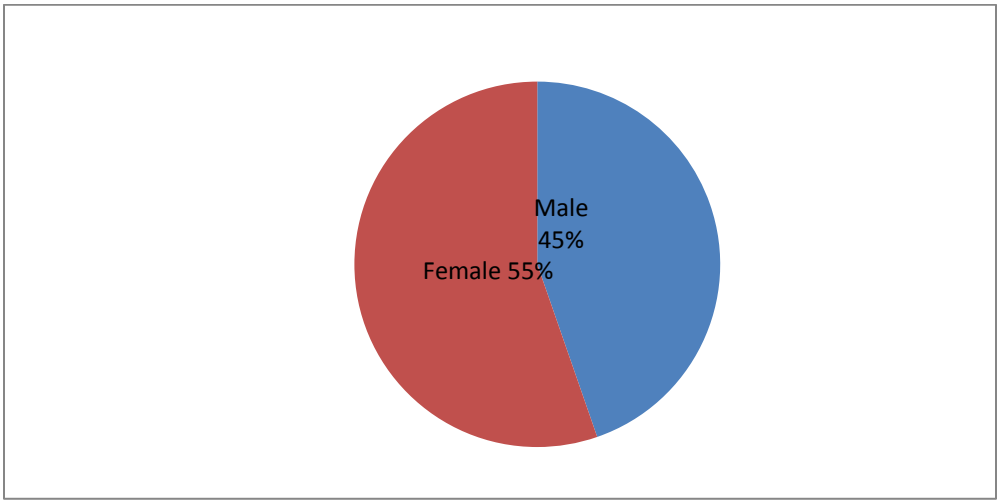

Figure 4.1 show the gender Distribution

Table 4.2 show the age Distribution

Age	Frequency	percent
Under 15 year	4	9%
15-30 year	15	32%
30-45 year	14	30%
45-60 year	8	17%
Over 60 year	6	13%
Total	47	100%

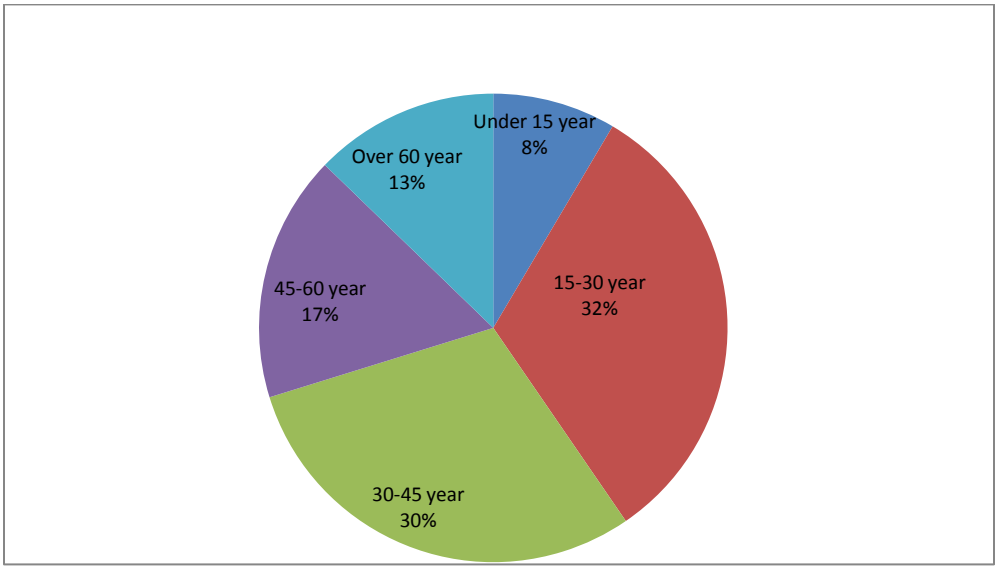

Figure 4.2 show the age Distribution

Table 4.3 shows the incidence of unilateral and bilateral pathological lesions.

Pathological lesion	Frequency	Percent
Bilateral	26	55%
Unilateral	21	45%
Total	47	100%

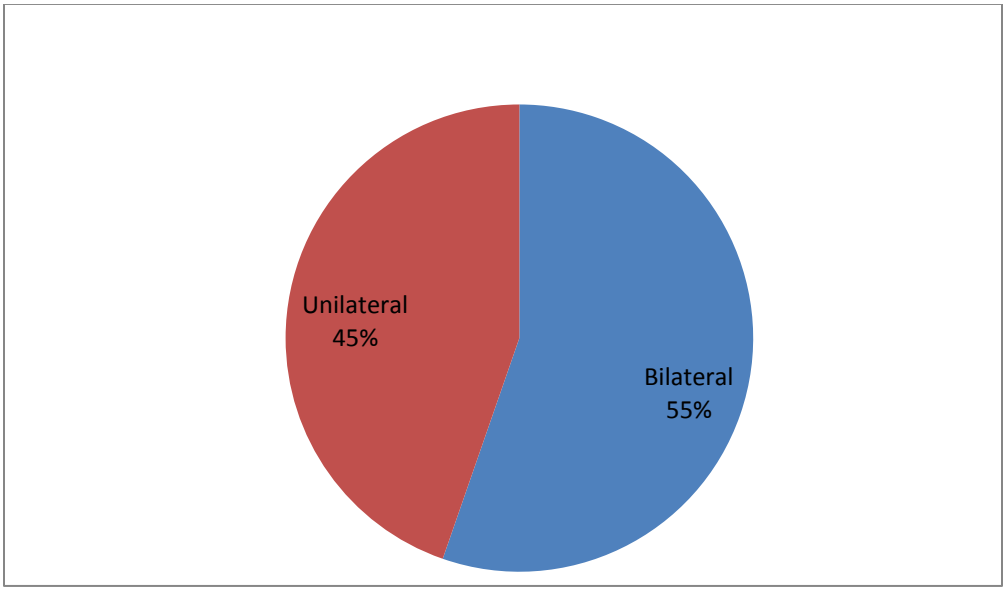

Figure 4.3 shows the incidence of unilateral and bilateral pathological lesions.

Table 4.4 shows the common site of lesion.

site of lesion	Frequency	percent
Frontal sinus	11	23%
Ethmoid sinus	26	55%
Maxillary sinus	39	83%
Sphenoid sinus	19	40%

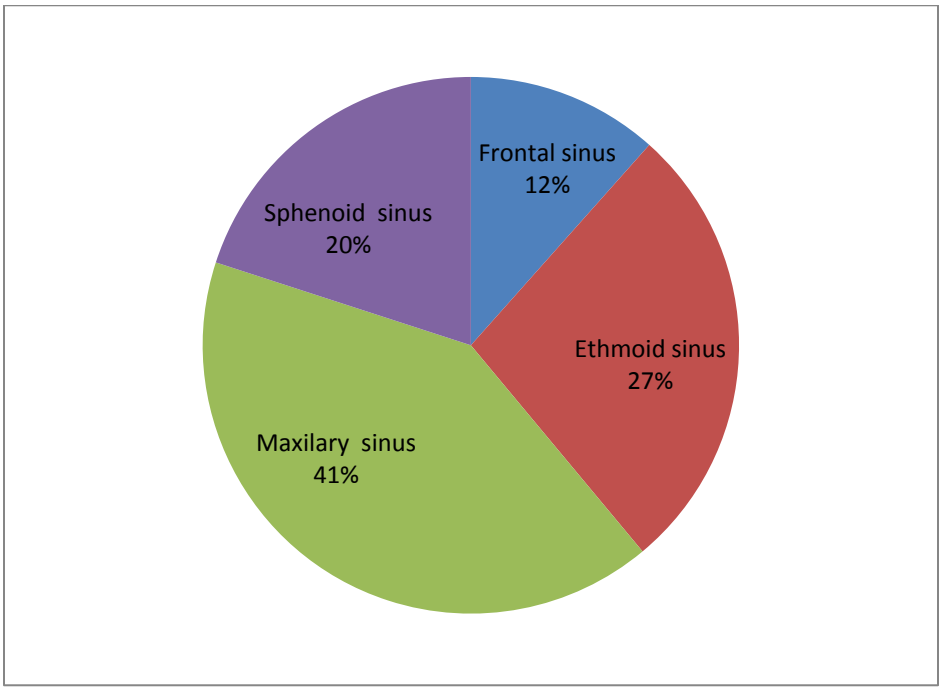

Figure 4.4 shows the common site of lesion.

Table 4.5 shows the common diseases of PNS .

Diseases	Frequency	Percent
Acute sinusities	5	9%
Chronic sinusities	15	26%
Fungal infection	5	9%
Polyps	13	22%
Mucocele	1	2%
Benign tumor	3	5%
Cyst	2	3%
Nasal septal deviation	1	2%
Rhino sinusities	9	16%
Conca bullosa	2	3%
Malignant tumor	2	3%
Total	58	100%

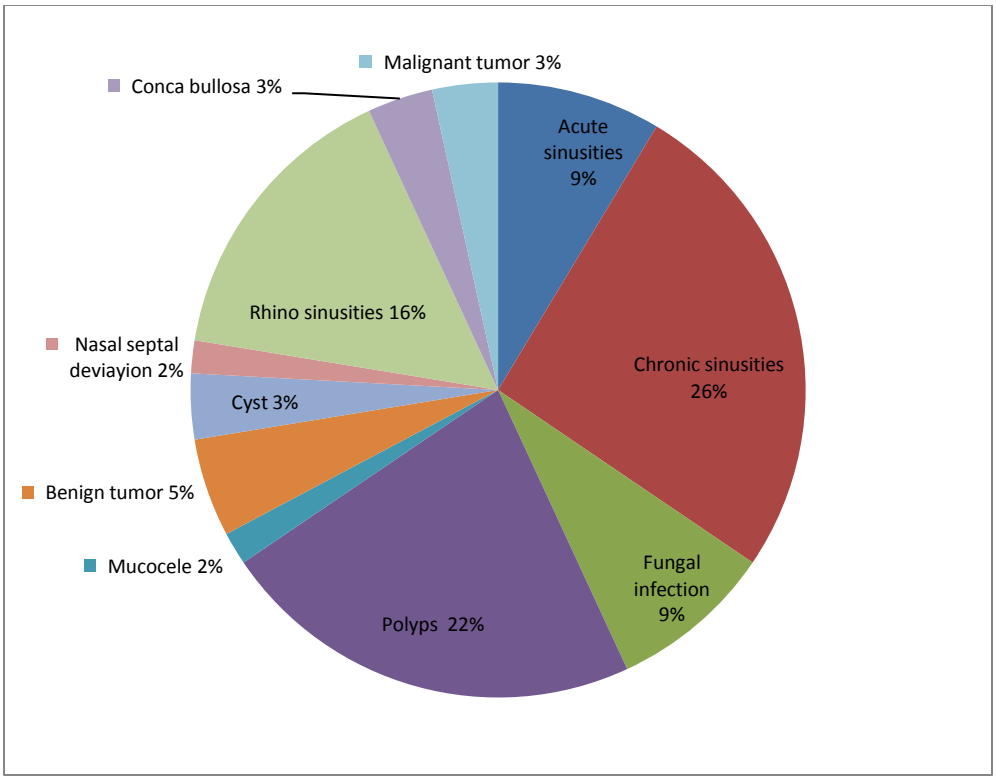

Figure 4.5 shows the common diseases of pns.

Table 4.6shows the relation of chronic sinusitis with gender.

Gender	Frequency	percent
male	6	40%
female	9	60%
Total	15	100%

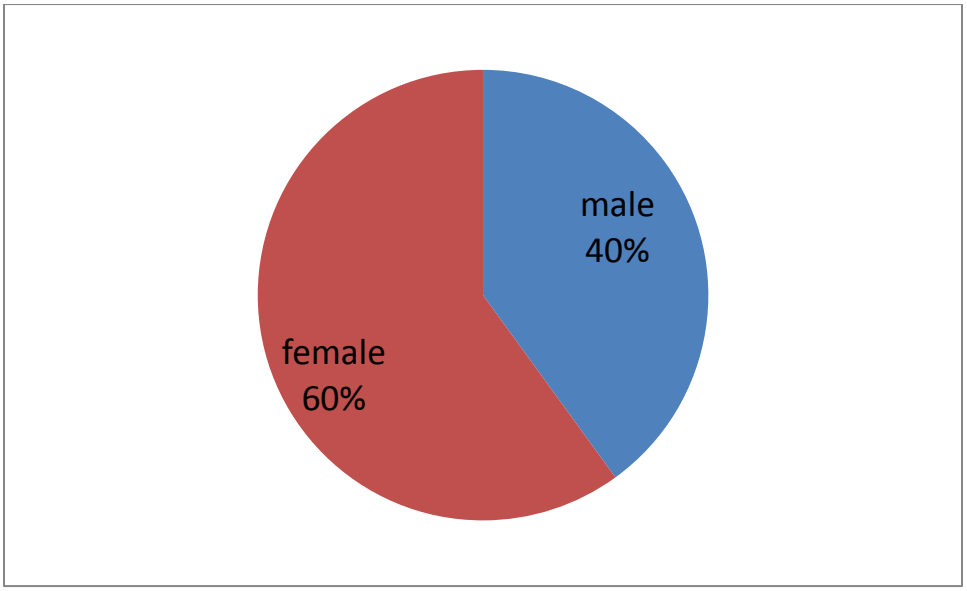

Figure 4.6 shows the relation of chronic sinusitis with gender.

Table 4.7 shows the relation of Polyps with gender.

Gender	Frequency	percent
male	5	38%
female	8	62%
Total	13	100%

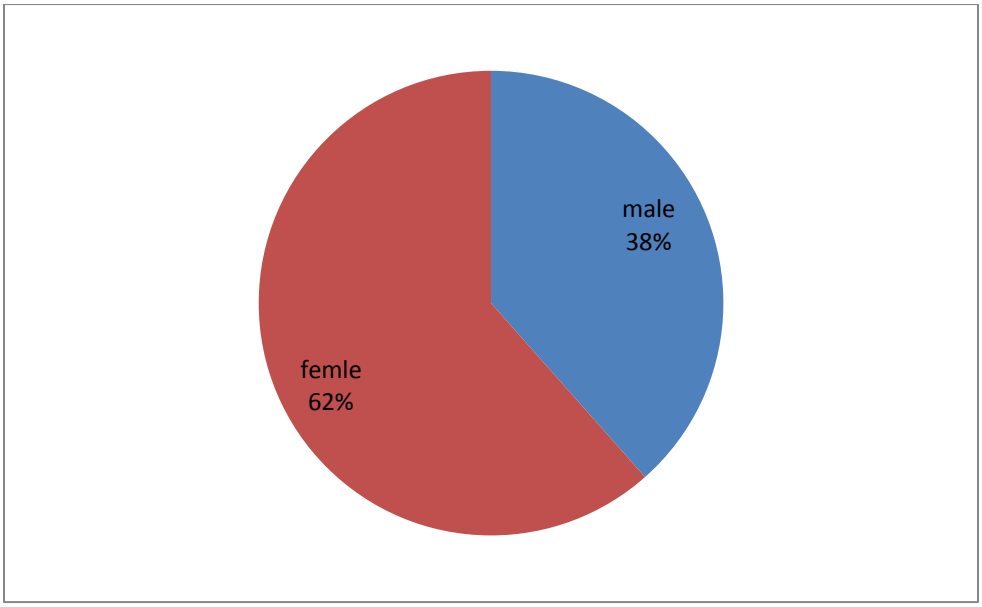

Figure 4.7 shows the relation of Polyps with gender.

Table 4.8 shows the relation of Rhino sinusitis with gender.

Gender	Frequency	percent
male	5	56%
female	4	44%
Total	9	100%

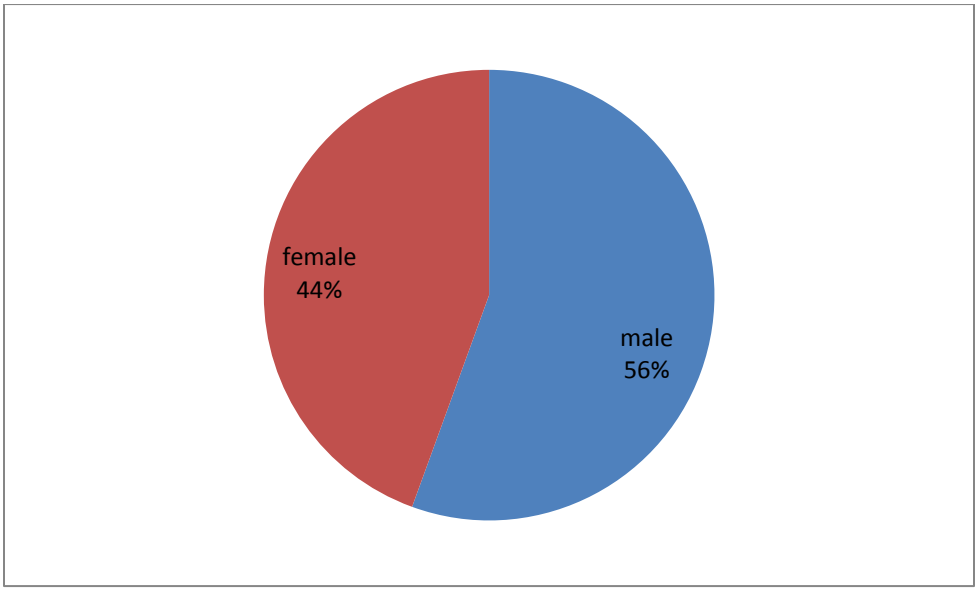

Figure 4.8 shows the relation of Rhino sinusitis with gender.

Table 4.9 shows the relation of chronic sinusitis with age.

age	Frequency	percent
Under 15 year	0	0%
15-30 year	6	40%
30-45 year	6	40%
45-60 year	2	13%
Over 60 year	1	7%
Total	15	100%

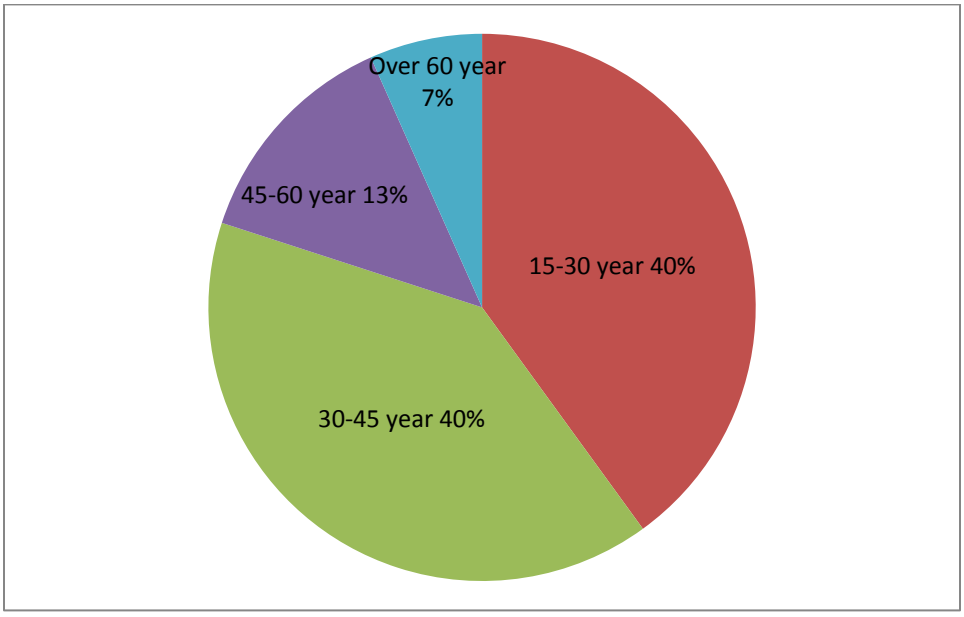

Figure 4.9 shows the relation of chronic sinusitis with age.

Table 4.10: shows the relation of Polyps sinusitis with age.

age	Frequency	percent
Under 15 year	0	0%
15-30 year	3	23%
30-45 year	4	31%
45-60 year	3	23%
Over 60 year	3	23%
Total	13	100%

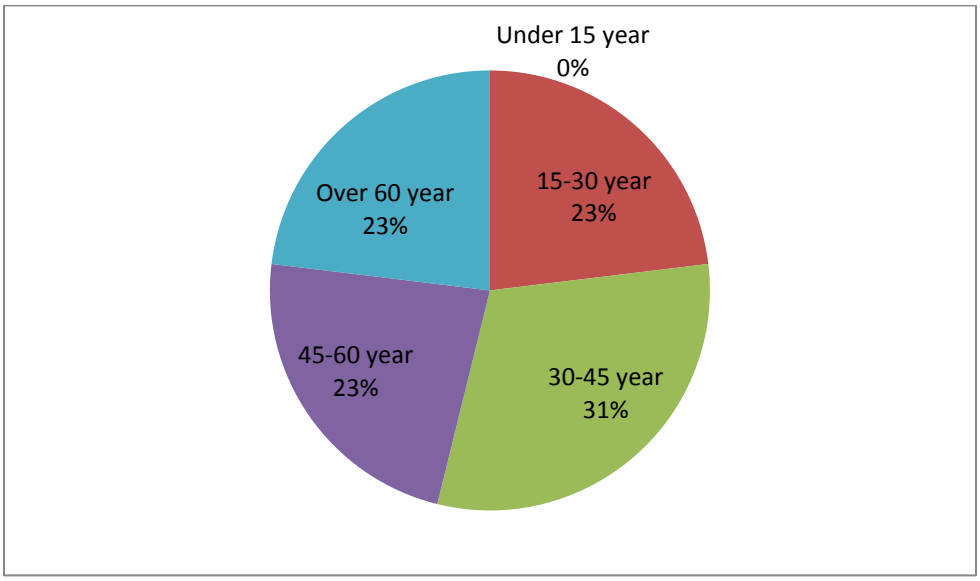

Figure 4.10: shows the relation of Polyps sinusitis with age.

Table 4.11: shows the relation of Rhino sinusitis with age.

age	Frequency	percent
Under 15 year	1	11%
15-30 year	3	33%
30-45 year	4	44%
45-60 year	1	11%
Over 60 year	0	0%
Total	9	100%

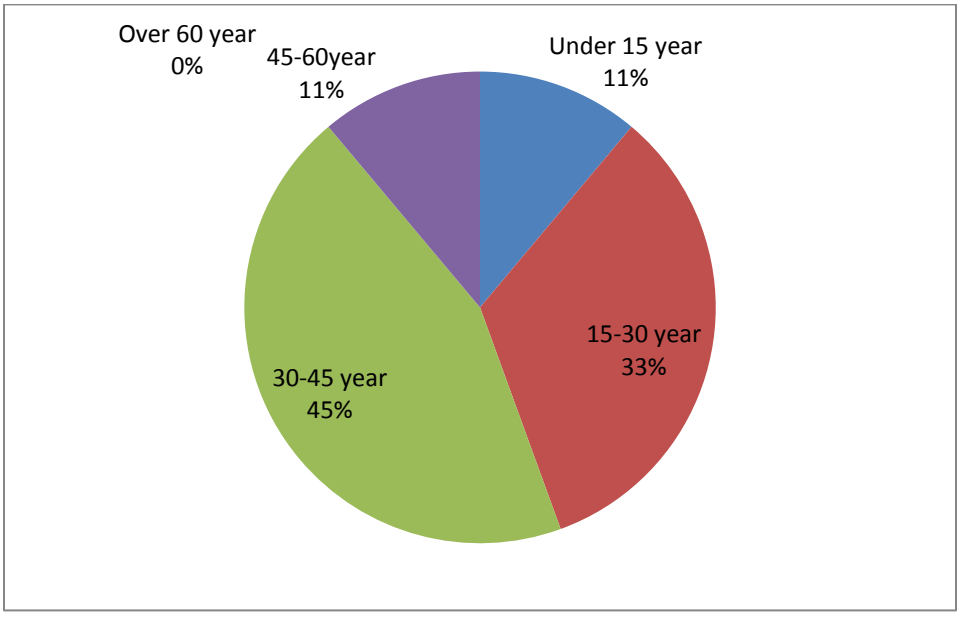

Figure 4.11: shows the relation of Rhino sinusitis with age.

Table 4.12: shows the relation of chronic sinusitis with Site of the lesion.

site of lesion	frequency	percent
Frontal sinus	3	6%
Ethmoid sinus	9	19%
Maxilary sinus	14	30%
Sphenoid sinus	6	13%

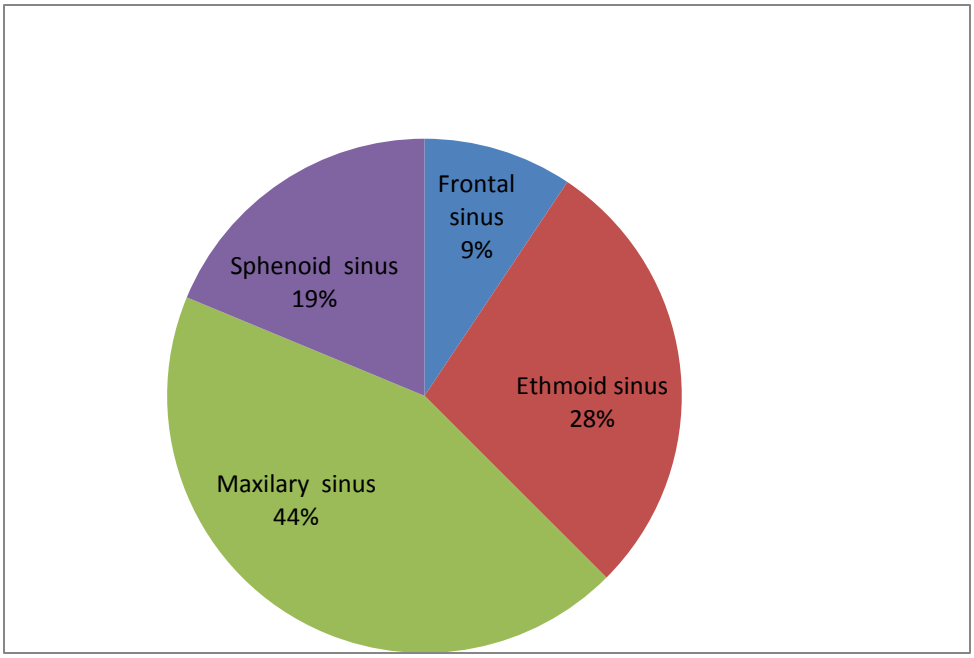

Figure 4.12: shows the relation of chronic sinusitis with Site of the lesion.

Table 4.13: shows the relation of Polyps with Site of the lesion.

site of lesion	frequency	percent
Frontal sinus	6	13%
Ethmoid sinus	5	11%
Maxilary sinus	13	28%
Sphenoid sinus	6	13%

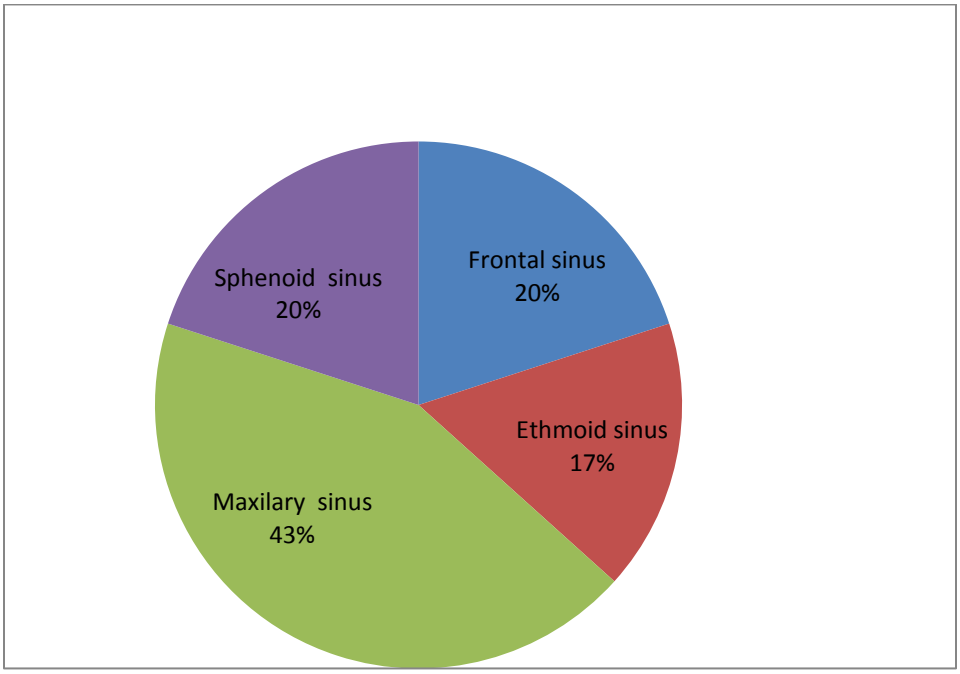

Figure 4.13: shows the relation of Polyps with Site of the lesion.

Table 4.14: shows the relation of Rhino with Site of the lesion.

site of lesion	frequency	percent
Frontal sinus	2	4%
Ethmoid sinus	8	17%
Maxilary sinus	9	19%
Sphenoid sinus	4	9%

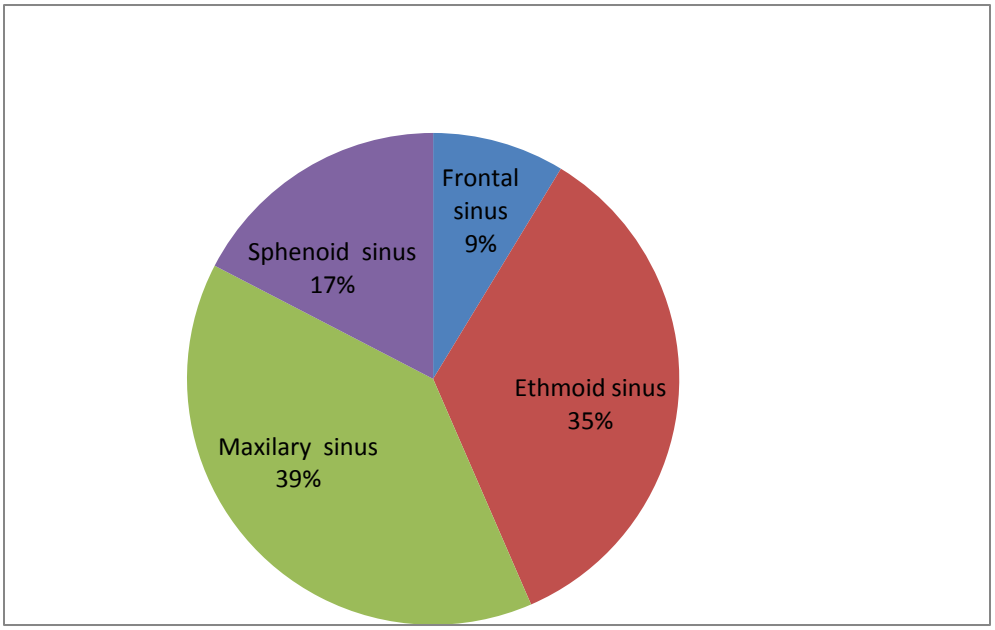

Figure 4.14: shows the relation of Rhino with Site of the lesion.

Chapter five

Discussions, conclusion and Recommendations

5.1: discussion:

This study is performed in 47 pt the gender distribution as follow(45% male and 55% female) as explain in fig (4.1) their age between (10 -70) years old. Referred to CT department and the result as following .their age frequency explain in table (4.2). the incidence of pathological lesion as follow 26 (55%)bi lateral and 21(45%) unilateral in table (4.3) fig(4.3).

15 pt (26%) having chronic sinusitis,13(22%)pt having polyps,9 pt (16%) having rhinosinusitis,5 pt (9%)having acute sinusitis, 5 pt (9%) having fungal infection ,3 pt (5%) having benign tumor , 2 pt (3%) having cyst , 2 pt (3%) having concha bullosa , 2 pt (3%)having malignant tumor , 1 pt (2%) having nasal septal deviation and 1pt (2%) having mucocele. All o them were explain in table (4.5) and fig (4.5) . the site of lesions as follow 39 pt (83%) in the maxillary sinus ,26 pt (55%) in ethmoid sinus ,19 pt (40%) in sphenoid sinus and 11 pt (23%) in frontal sinus all of them in table(4.4) fig(4.4). The relation of common pns disease which chronic sinusitis with gender in table (4.6) fig(4.6) .the relation of polyps with gender in table (4.7) fig(4.7) and the relation of rhinosinusitis with gender in table (4.8) fig(4.8).the realation of chronic sinusitis with ageexplains in table (4.9) fig

(4.9).the realation of polyps with ages explains in table (4.10) fig (4.10).the realation of rhinosinusitis with age explain in table (4.11) fig (4.11).the realation of chronic sinusitis, polyps and rhino sinusitis with site of lesionsin explains in tables (4.12) ,(4.13) and (4.14) fig (4.12),(4.13) and (4.14).

These result was relative to (Dua k et al) who detected fifty patients of chronic sinusitis evaluated by CT . he was found anatomical variation by CT is higher.

These result agree with (Olk an (2013) their result found abnormalities in maxillary and ethmoid sinuses had higher frequency.

5.2: Conclusion:

CT is modality of choice in imaging of paranasal sinuses for evaluating the chronic diseases,associated complication.

This study was concluded that the pathological lesions is common in rang of age (15 -30)female more affected than male ,bi lateral lesions have higer percentage ,the disease of chronic sinusitis is common and the common site is maxillary sinuses , the chronic sinusitis affected female more than male.

5.3: Recommendations:

I recommend to perform CT for PNS because it is more effective and superior than plain X RAY.

I recommend that the early diagnosis and early treatment reduce the complication.

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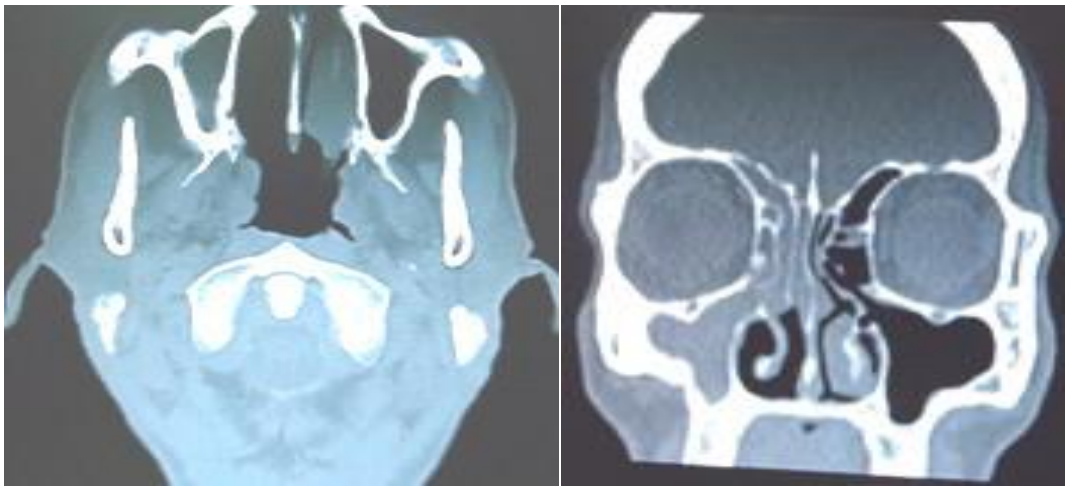
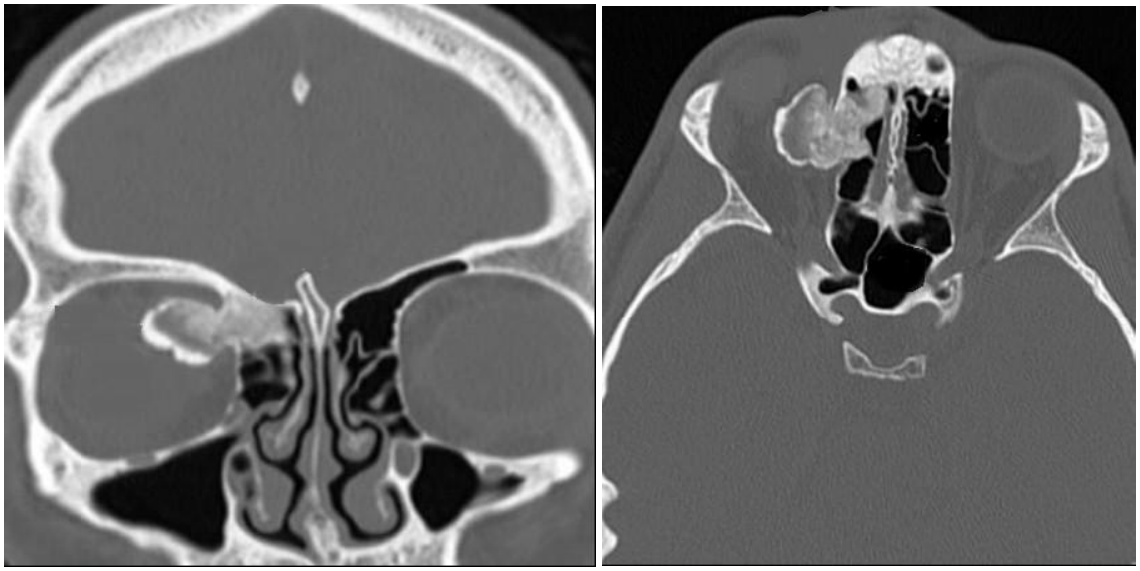
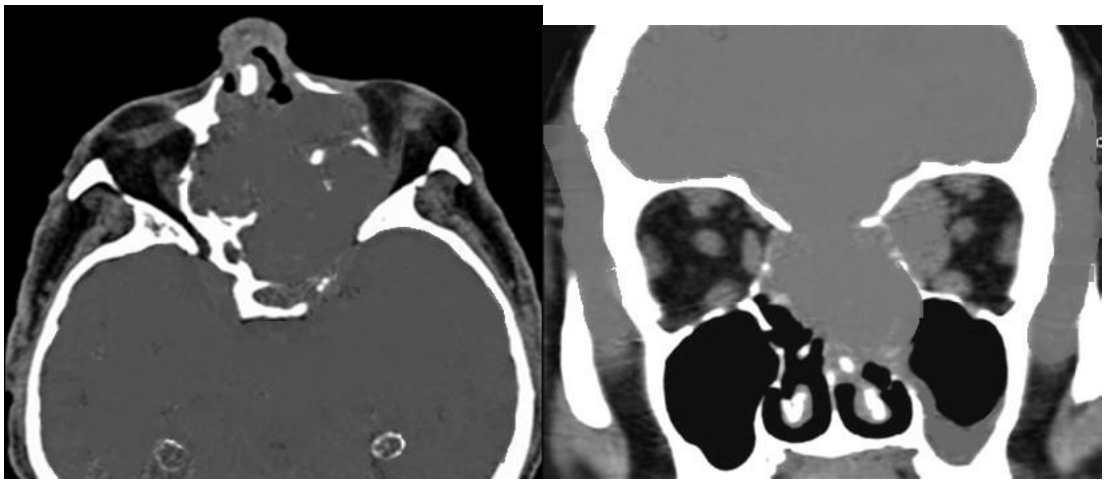
Appendix (1) images



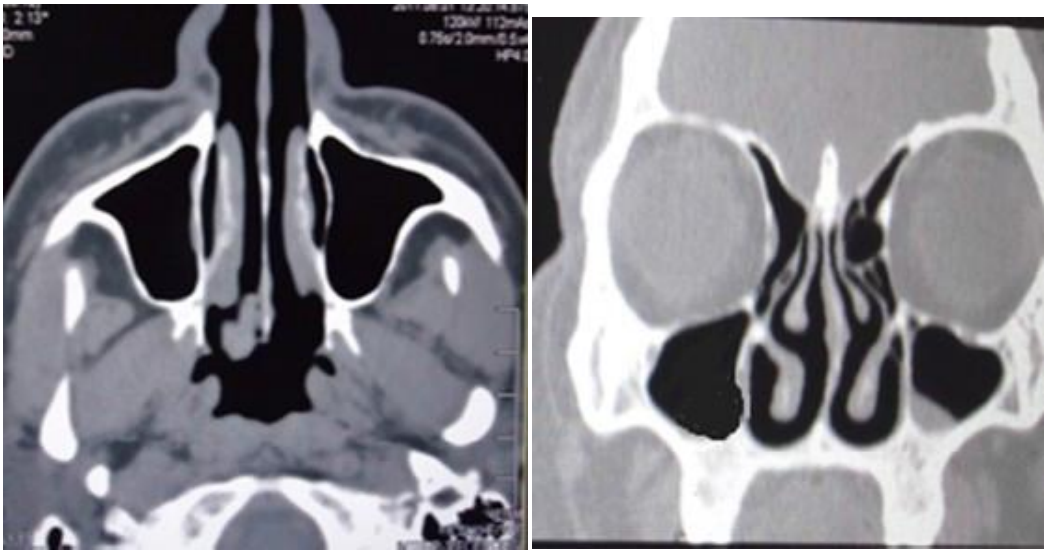
Images (a-b): axial and coronal CT images demonstrate chronic sinusitis disease in a 36 years old man:



Images (a-b): axial and coronal CT images demonstrate benign osteoma in a 17 years old man:



Images (a-b): axial and coronal CT images demonstrate adenocarcinoma in a 58 years old man



Images (a-b):axial and coronal CT images demonstrate acute sinusitis in a 45 years old female:

Appendix (e): Work sheet:

Patient NO	Gender	Age	Lesion	Side of lesion		Site of Lesion			
				Unilateral	Bilateral	Maxillary	Ethimoid	Sphenoid	Frontal