



St. Paul Hospital Millennium Medical College
Graduate Study Program

Clinicopathologic profile of Sino nasal lesions in St. Paul Hospital Millennium Medical College.

Nesha Ahmed Aman (MD, Pathology Resident)

Addis Ababa, Ethiopia

March 2024GC

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Nesha Ahmed Aman(MD, Pathology Resident)

Address of investigator Cell Phone: +251921505293

Email: neshaahmed720@gmail.com

Advisor:

- Dr. Desalew Gedamu (MD, Pathologist at St Paul Hospital millennium medical college).

- Mr. Samson Zegeye (Lecturer at St Paul Hospital millennium medical college)

A Thesis submitted to the Department of Pathology; Presented in Partial fulfillment of the Requirements for the postgraduate diploma in Anatomic Pathology, St. Paul Hospital Millennium Medical College Addis Ababa, Ethiopia

March 2024Gc

Abstract

Background: - The nasal cavity and paranasal sinuses are parts of the Sino nasal tract. Sinonasal lesions encompass a broad spectrum of disorders, ranging from benign to malignant conditions, each presenting unique challenges in diagnosis and management. The research aims to provide a comprehensive analysis of the demographic characteristics, clinical presentations, and histopathological features of sinonasal lesions encountered in the specified medical institution. A thorough examination of medical records, imaging studies, and histopathological findings were conducted to identify patterns, prevalence, and associated risk factors.

Methods: - The work was planned to study clinicopathologic profile of sinonasal lesions and comparing clinical, radiologic and histopathology findings. This cross-sectional study was conducted on 450 cases of sinonasal lesions of which histopathology specimen sent to pathology department, St. Paul Hospital millennium medical college over 5 years. Non-probability convenience sampling technique was used. All cases during study period were included after exclusion of 130 cases based on exclusion criteria. The collected data were cleaned and analysed using the statistical software Epidata Version 3.1 and SPSS Version 27.0.1, respectively.

Result: - A study of 450 lesions was undertaken. They constituted 1.7% of the total histopathological workload at our institution. Inflammatory and tumor like lesions constituted 50 % followed by benign tumors constituting 26.4% and malignant tumors constituting 23.6% of the total number of cases. Among 450 cases 216(48%) had available radiologic data for analysis. Comparison of clinical and radiological findings with Histopathology diagnosis showed that there were 150(33%) cases from 450 and 144(67%) patients out of 216 in whom the Clinical and radiological findings were comparable with Histopathology diagnosis respectively. In the remaining cases, clinical and radiological findings were either different or inconclusive. When comparing radiological finding with clinical suspicions, 81% of the cases having Radiologic data showed consistent finding with clinical suspicion.

Conclusion: Inflammatory polyp the most common histopathology diagnosis at this site followed by Sinonasal papilloma which is benign lesion. Squamous cell carcinoma were the most common malignant lesions of sinonasal tract. Clinical and radiologic diagnosis of specific lesion were quite challenging, histopathology evaluation with clinicoradiological correlation are crucial to settle specific diagnosis and management of patients accordingly.

Keywords: Sinonasal, Clinicopathologic, Inflammatory, Benign, Malignant, Histopathology.

Acknowledgements

Firstly, I would like to thank the St. Paul Hospital Millennium Medical College's Department of Pathology for providing me with the chance to carry out this study.

I express my gratitude to Dr. Desalew Gedamu and Mr. Samson Zegeye, my research advisers, for their support, direction, and knowledgeable counsel.

I am appreciative of the entire Pathology department personnel; your positive atmosphere and support enabled me to complete my daily tasks during my Pathology residency.

I appreciate the technical assistance provided by the SPHMMC Radiology Department staff during the data gathering phase.

Finally, I would want to express my gratitude to my classmates and family for their unwavering support and encouragement during my residency training at SPHMMC.

Acronyms and abbreviations

AC	Adenocarcinoma
CT	Computed Tomography
GC	Gregorian Calendar
HPV	Human Papilloma Virus
NC	Nasal Cavity
NAP	Nasopharyngeal
PNS	Para Nasal Sinus
SNM	Sinonasal Mass
SNT	Sinonasal Tract
SCC	Squamous Cell Carcinoma
SPHMMC	St Paul Hospital Millennium Medical College
WHO	World Health Organization

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1. Introduction

1.1. Background

The nasal cavity and paranasal sinuses (maxillary, ethmoid, frontal, and sphenoid) are part of the Sino nasal tract (SNT). The nasal septum and the columella, at the anterior extremity, separate the nasal cavity into the nares. The vestibule is the front part of each nasal cavity. Each cavity's posterior border, which divides it from the nasopharynx, is formed by the choana. The lateral walls of each nasal cavity are called turbinates, and the superior boundary is formed by the cribriform plate. Skin with adnexal structures, such as hair, lines the lower part of the vestibule. The nasal cavity, with the exception of its topmost part, is lined by ciliated columnar epithelium posterior to the vestibule(1). The superior one-third of the nasal septum, the superior turbinate, and the cribriform plate are covered with thinner olfactory mucosa(1). The paranasal sinuses are diverticula of the nasal cavity that extend into neighboring bones. The mucosa of the paranasal sinuses is in continuity with the nasal cavity and lined by pseudo stratified, ciliated columnar epithelium(1).

In clinical practice, a range of neoplastic and non-neoplastic disorders affecting the nasal cavity, paranasal sinuses (PNS), and nasopharynx are frequently seen(2). Because the paranasal sinuses and the nose are congruent, diseases that affect one can impact the other. This may be the result of the nasal cavities' and paranasal sinuses' shared mucosal lining. Since the nose shapes the face primarily, it serves an aesthetic purpose and diseases affecting it are typically readily apparent(3).

In Ear Nose Throat (ENT) practice, diseases of the nose and paranasal sinuses are frequently observed. The most common condition encountered is rhinosinusitis, with inflammatory polyps being the most prevalent histopathological finding. The most prevalent malignant lesion, squamous cell carcinoma, is more commonly in men(4). Sinonasal malignancies make up <5% of all head and neck neoplasms, with an incidence of 0.556 per 100,000 individuals per year (4) where SCC being the most common malignant lesion(5). Among benign tumors, Inverted papilloma was the most common.

Patients often appear with minor nasal symptoms, and if careful attention is not given to the patient's examination, it is always possible to miss the diagnosis. Timely diagnosis and early medical treatment will decrease the burden of morbidity and mortality in these patients(6).

To establish a tentative diagnosis, comprehensive medical histories, a clinical assessment, a diagnostic nasal endoscopy, and sophisticated imaging are needed. To determine the nature of a particular lesion, however, a thorough histological study is required for a final diagnosis and appropriate treatment(7).

Cross-sectional imaging of the sinonasal region is crucial for planning radiotherapy, angioembolization of vascular tumours to stop severe bleeding, and mapping the extent of surgical margins. It also helps narrow down differential diagnoses. Although many of the lesions exhibit distinctive CT and MRI findings, some have non-specific imaging results that need to be examined further for a definitive diagnosis(8).

1.2. Statement of the problem

The incidence of mass in nasal cavity and paranasal sinuses was 51.11 per 1,000 cases admitted to ENT Wards of SMS Medical College, Jaipur from August 2008 to July 2010. Hospital admission incidence of sino-nasal masses found to be 1.55 per 1,000 admissions in SMS Hospital(7).

Sino-nasal masses inflammatory and tumor like lesions were 68.56 % cases, benign tumors were 22.72 % and the malignant were 8.71 %. The ratio of inflammatory and tumor like lesions to neoplastic lesions was 2.18:1(7).

Malignant tumors of the sinonasal tract (SNT) are rare, comprising less than 1% of all neoplasms and about 3% of those of the upper aerodigestive tract. SNT malignancies most commonly affect the maxillary sinus (~60%), followed by the nasal cavity (~22%), ethmoid sinus (~15%), and frontal and sphenoid sinuses (~3%) .SNT tumors are diverse, with the majority composed of SCC and its variants (55%), followed by nonepithelial neoplasms (20%), glandular tumors (15%), undifferentiated carcinoma (7%), and miscellaneous tumors (3%)(9).

In pediatric incidence of sinonasal malignancies were 0.052 per 100,000 per annum(10).

In Ethiopia, illustrative statics on Clinic pathologic profile of Sino nasal lesions biopsy has not yet been undertaken. The research aims to provide a comprehensive analysis of the demographic characteristics, clinical presentations, and histopathological features of sinonasal lesions encountered in the specified medical institution. A thorough examination of medical records, imaging studies, and histopathological findings were conducted to identify patterns, prevalence, and associated risk factors.

1.3. Rationale of the Study

The outcomes of this study are anticipated to contribute valuable insights into the epidemiology and diagnostic trends of sinonasal lesions, facilitating improved clinical management and further research endeavors in the field.

2. Literature Review

The incidence of mass in nasal cavity and paranasal sinuses was 51.11 per 1,000 cases admitted to ENT Wards of SMS Medical College, Jaipur from August 2008 to July 2010(7) Hospital admission incidence of sino-nasal masses was found to be 1.55 per 1,000 in SMS Hospital (7). This study conducted for five years comprised of 264 cases of sino-nasal masses. Among these, inflammatory and tumor like lesions were 68.56 %, benign tumors were 22.72 % (60 cases) and the malignant were 8.71 % (23 cases).

The study included lesions of the nasal cavity, paranasal sinuses and nasopharynx. During the course of this study(11), a total of 3393 specimens were received in the surgical pathology department. Of these, 104(3.06%) constituted the specimens of nose, paranasal sinuses and nasopharynx. The lesions were grouped into 3 categories: Inflammatory and tumor like, benign tumors and malignant tumors. Inflammatory and tumor like lesions were the commonest constituting 74.04% of the total cases, followed by malignant tumors constituting 13.46% and benign tumor constituting 12.5% of the cases(11).

As reported in (5), the most affected age group was 41–50 years (29.4 %), and the least number of cases was seen in 0–10 years (2.9 %). The youngest patient was 8-year-old male child and the oldest patient was 72-year-old male(2). A total of 76 patients had Sinonasal mass who had complete data for analysis. The age range from 5-64 yrs. with a mean age of 33.3 yr. median and modal age of 35.00 (SD = 13.1 ± 1.5). Majority of the patients were in the age groups 21-50 yrs. There were 34 males and 42 females with M: F ratio of 1:1.2. Sinonasal masses were found to be bilateral in 34 (44.7%), left sided in 24(31.6%) and right sided in 18 (23.7%) patients(5).

The main presenting symptoms are nasal blockage 97.4%, rhinorrhea 94.7%, allergic symptoms 52.6%, anosmia 34.6% others. Duration before presentation was within 1 to 360 months with a mean duration of 40 months(5). In other study Nasal obstruction was the most common presentation (81.6 %), followed by nasal discharge (61.7 %), and then epistaxis (38.2 %). External nasal deformity (6.6 %) was the least common mode of presentation, followed by headache (13.9 %)(2).

In most patients (60/76) there were unilateral, only 16 patients had bilateral nasal masses(12).

In the inflammatory and tumor like category, Inflammatory polyps were the commonest lesions. Out of the 77 such cases Inflammatory polyps constituted 26.93% (n=28). This was followed by Allergic polyps 21.16% (n=22), 14 cases of Rhinoscleroma (13.46%), 4 cases of Rhinosporidiosis (3.85%), 3 cases of Atrophic Rhinitis (2.89%) and 2 cases each of Rhinophyma, cholesterol granuloma and Adenoids (1.92% each) (11). Other studies showed simple inflammatory nasal polyp in 28 (36.8%), inverted papilloma in 11 (14.5%), allergic nasal polyp 8 (13.1%), fibroepithelia polyp in 8 (10.6%), plasmacytoma 4 (6.6%) nasal capillary hemangioma 2 (2.6%) (5).

Among neoplastic lesions, 60 (44.77%) were malignant, 73 (54.47%) were benign, and only one (0.74%) of the cases was intermediate. Among 134 cases, nasal cavity (NC) was the most common site of biopsy comprising 107 (79.8%) of cases, followed by nasopharyngeal (NAP) 18 (13.4%), and paranasal Sinus (PNS) 4 (2.9%). Nasal cavity (NC) was also the commonest site for benign neoplasms comprising 65 (48.5%) cases. Only one lesion of intermediate malignancy in the series also occurred in the nasal cavity(NC) (13).

In (13),Inverted papilloma was the most common benign lesion comprising 28 (20.8%) of total lesions, whereas squamous cell carcinoma (SCC) and nasopharyngeal carcinoma (NPC) were the most common malignant lesions comprising 12 (8.9%) cases each.

SNT malignancies most commonly affect the maxillary sinus (~60%), followed by the nasal cavity (~22%), ethmoid sinus (~15%), and frontal and sphenoid sinuses (~3%). They were diverse with the majority composed of SCC and its variants (55%), followed by nonepithelial neoplasms (20%), glandular tumors (15%), undifferentiated carcinoma (7%), and miscellaneous tumors (3%)(9).

In Nigeria malignant sinonasal tumours account 1.57% of Rhinology cases(14).

Comparison of clinical and radiological findings showed that there were 211 patients out of 254 (83.07 %) in whom the radiological findings were consistent with that of clinical suspicion. In 43 (16.73 %) patients either the radiological findings were different or inconclusive(7).

Comparison of histopathological findings with clinical findings showed that of the 119 patients with clinically non-neoplastic benign polyps, 100 patients had inflammatory, 12 fungal nasal polyp, 4 rhinolith, 2 meningioma, and 1 case of esthesioneuroblastoma(7).

Radiologically relevant features of sinus predominant pathologies. Sinus size, Expanded in inflammatory polyp and mucocele, reduced-maxillofacial Fibrous dysplasia and normal in acute sinusitis. Sinus walls, Thickened and sclerotic: chronic sinusitis, Thinned and eroded: Fungal sinusitis. Soft tissue with hyperdense contents in sinus, Inspissated secretions and Fungal sinusitis(8).

Widespread bony destruction is a feature of high-grade malignancies, whereas permeative pattern of lytic bone lesions without frank destruction is typical of small round cell tumors. Benign lesions and low-grade malignancies demonstrate bony expansion owing to their slow and expansile growth pattern(8) Regional lymphadenopathy, significant in malignant pathologies(8).

Cross-sectional imaging of sinonasal space not only plays a role in honing down differential diagnoses but is also an essential part of preoperative work-up to map the extent of surgical margins and plan radiotherapy as well as for angioembolization of vascular tumors to prevent massive bleeding. Many of the lesions have characteristic CT and MRI findings, while some have non-specific imaging findings requiring histopathology for final diagnosis(8).

3. Objectives

3.1. General Objective:

- To assess Clinicopathologic profile of Sino nasal lesions in St. Paul Hospital Millennium Medical College from June 2018 to June 2023 GC.

3.2. Specific objectives:

- To determine the Histopathology pattern of Sinonasal lesions in Saint Paul hospital millennium medical college
- To compare clinical and radiologic assessment with histopathology finding

4. Methods and Materials

4.1. Study Setting:

St Paul's Hospital millennium medical college is one of the biggest Hospitals in Ethiopia, found in the capital Addis Ababa, Gulele sub-city near Swaziland Street. St Paul's Millennium Medical College, as it is known today, was established through a decree of the Council of Ministers in 2010, although the medical school opened in 2007 and the hospital was established in 1968 by the late Emperor Haile Selassie.

It is governed by a board under the Federal Ministry of Health. The College initiated Ethiopia's first integrated modular and hybrid problem-based curriculum for its undergraduate medical education, and is currently expanding to postgraduate programs and diversifying its undergraduate program offerings. St Paul's is in the process of building its capacity quickly in a short period of time, growing from 3 to 250 faculty members in the last six years, and expanding teaching facilities.

The college has more than 2800 clinical, academic and administrative and support staffs that provide medical specialty services to patients who are referred from all over the country, teaching medicine and nursing students and doing basic and applied researches. While the inpatient capacity is more than 700 beds, The College sees an average of 1200 emergency and outpatient clients daily.

St. Paul's Hospital Millennium Medical College provides healthcare and training to its students through its different biomedical and clinical departments, including Anatomy, Physiology, Biochemistry, Pharmacology, Public health, Pathology, General Surgery, Internal Medicine, Obstetrics and Gynecology, Pediatrics and child health, Emergency Medicine, Urology, Neurology, Orthopedics, Psychiatry, Ophthalmology, ENT, Dentistry and Maxillofacial Surgery, Radiology, Anesthesiology, Nursing, ICU (Intensive Care Unit), ART (HIV care), Endoscopy, Physiotherapy, Laboratory and Pharmacy.

The pathology service is also one of the few centers in the country providing fine needle aspiration cytology (FNAC) service for more than 7,000 patients and biopsy services for more than 5,000 patients annually so far since its establishment as medical specialty in the college in 2014 G.C (Pathology department record file).

4.2. Study Period:

This study was conducted in the period of five years (from June, 2018 to June, 2023 G.C), while, data collected in a period 10 days(November 1-10/2023) in Saint Paul Hospital Millennium Medical College.

4.3. Study Design:

Cross sectional study design was conducted in Saint Paul hospital millennium medical college June 2018 to June 2023 G.c.

4.4. Source Population:

Source populations are all patients who presented to or had their biopsies sent to SPHMMC; it represents patients from Addis Ababa or regional states during the study period.

4.5. Study Population:

Study population are patients of all age groups who had Clinicopathologic profile of sinonasal lesions with their biopsy sent to SPHMMC, Pathology department during the study period.

4.6. Selection criteria

4.6.1. Inclusion criteria

All Clinicopathologic profile of sinonasal diseases biopsies during the study period was included.

4.6.2. Exclusion criteria

All cases with skin based lesion, tumour with epicenter at nasopharyngeal area and punch biopsy followed by excisional biopsy were excluded.

4.7. Sample Size

All Clinicopathologic profile of sinonasal lesion biopsy samples in the study period were included (450 cases).

4.8. Sampling Procedures

All Clinicopathologic profile of sinonasal lesions biopsy samples in the study period was considered for the study after exclusion of 130 cases based on exclusion criteria.

4.9. Data Collection tools

Using structured questionnaire prepared by modification of different literature(12)((15), which contains demographic data, clinical information and diagnosis, radiographic finding and diagnosis, and gross finding and histopathology diagnosis. Histopathology data was collected from electronic record of Department of pathology. Demographic data and clinical information from histopathology request form from Pathology department SPHMMC archive and chart review from SPHMMC medical record room. Radiologic information from chart and electronic record of Radiology department SPHMMC. The data was collected by four Pathology Residents.

4.10. Variables

4.10.1. Dependent variables (Outcome variable)

- Clinicopathologic profile of sinonasal lesion.

4.10.2. Independent variables

- Age
- Sex
- Anatomic site of the lesion

4.11. Quality measurement

In order to maintain the data's reliability, a data collection tool was created, the principal investigator pretest the tool on 10% of the sample, and data collectors received training. To address any problems or worries that might come up during data collection, regular meetings were held with the data collectors. To guarantee that the data was accurate and reliable, any inconsistencies or inaccuracies were quickly identified and fixed. In order to reduce errors and guarantee data accuracy, double data entry was carried out. Additionally, data checking procedures were put in place to find any errors or contradictions in the data. Additionally, data exporting protocols were used to send and store the data in the right forms securely. Over all, these actions were done to guarantee the accuracy of the information gathered and to preserve the integrity of the study results.

4.12. Data presentation

Graphs, tables and diagrams were used as necessary to present findings.

4.13. Data processing and analysis

Initial data entry were conducted by Epidata 3.1 statistical software. IBM SPSS version 27.0.1 was used for second data entry and validation. IBM SPSS version 27.0.1 was then used for data analysis. P values were obtained by cross tabulation and Chi-square tests to compare the variables in nominal by nominal and non-parametric kiruskel wallis H test and mann whitney U test used to compare nominal and scale variable, and a P value of ≤ 0.05 was regarded as proof of a significant difference. For nominal variables, the data are summarized using a frequency table; for continuous variables, the measures of central tendency and dispersion were used. IBM SPSS 27.0.1 was used to create the graphics and tables, while Microsoft Excel was used to edit them.

4.14. Operational definition:

- Sinonasal lesion: This condition affects the sinonasal tract and can be benign or malignant, as well as inflammatory and tumor-like(16, 17)
- Tumor-like lesion and inflammation: These non-neoplastic conditions include pseudocyst, inflammatory, allergy, and hamartoma.(10, 13)
- Benign - When a tumor's microscopic and gross features are deemed to be relatively innocent, it is termed to be benign. This implies that the tumour will remain localised and that it is easily removed surgically(16)
- Malignant: A neoplastic lesion that has the ability to penetrate, destroy nearby structures, and travel to far-off locations (metastasize) in order to cause death(16)
- Nasal mass: Any abnormal development within the nose is referred to as a nasal mass(17).
- Nasal obstruction: This type of discomfort is characterised by a sensation of inadequate airflow through the nose(18).
- Anatomic lesion site: The body part from which the biopsy was collected, as reported by the clinician on the histopathology request form(19)

4.15. Ethical considerations

Ethical clearance was obtained from institutional review board (IRB), SPHMMC after approval by the research advisor. Confidentiality was kept by avoiding recording of names of clients on data collection format, client records were made available to the investigators and data collectors and returned to its place after completion of data entry. Every patients result was kept confident by using the patient's biopsy code. Permission to collect data was obtained from the department of pathology and medical record room of SPHMMC.

4.16. Data Dissemination Plan

- The final paper hard copy will be made available at library.
- English language, graphics, charts and table will be used to easy understand for audience.
- Summary or infographic will accompany the hard copy for easier understanding.
- Provide opportunities for the audience to ask questions and engage in discussion about the research.
- Collaborate with Saint Paul Hospital millennium medical college , Pathology department to host a presentation or workshop about the research findings
- Collaborating with other researchers and journals for publications.

5. Result.

The present study includes the lesions of the nasal cavity and paranasal sinuses. These lesions were studied using data over a period of five years, from June 2018 to June 2023 Gc. During the course of this period, a total of 34,500 specimens were received in the surgical pathology department. Of these, 580 (1.7%) constituted the specimens of nose and paranasal sinuses . After excluding 130 cases based on exclusion criteria 450 cases were analyzed.

5.1. Sociodemographic characteristics of the respondents.

Majority of the patients were in the age groups 21-50 years which range from 2-90 year old with mean age of 37.43 (SD 18.219). There were 256(56.7%) males and 194(43.3%) females with M:F ratio of 1.3:1(N=450).(Figure 1)

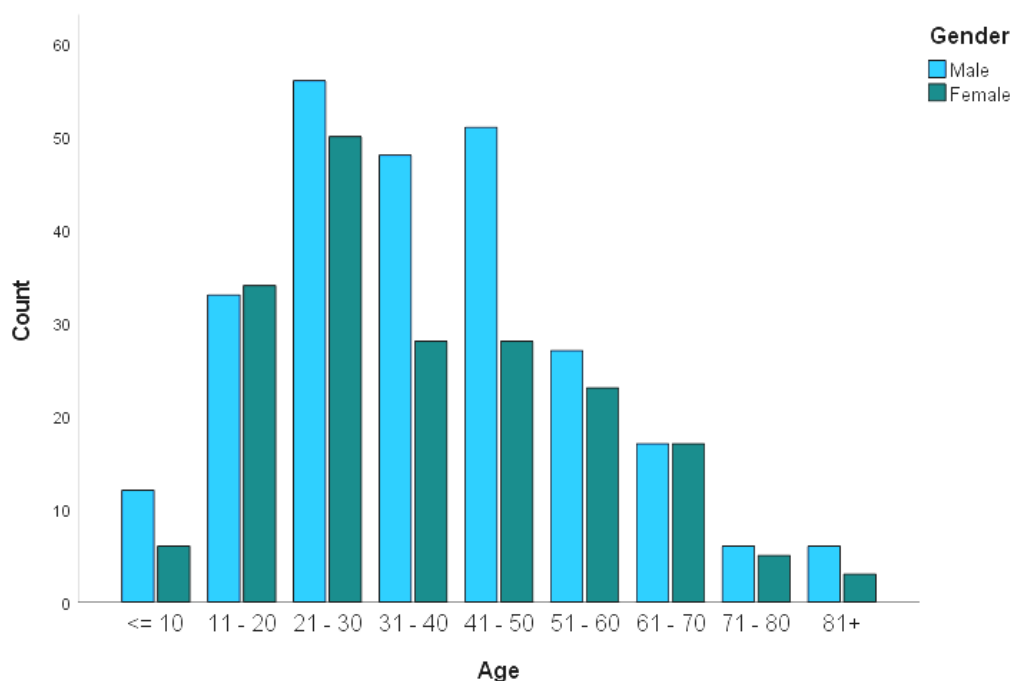


Figure 1 - Age and gender distribution sinonasal lesions cases in Saint Paul hospital millennium medical college from June 2018 to June 2023 GC

5.2. Clinicopathologic profile of Sino nasal lesions

5.2.1. Clinical presentation.

The main presenting symptoms are nasal obstruction 69.9 %, nasal mass 44.6%, nasal discharge 21.6% nasal bleeding 16.3% and others in (Table 1). Proptosis, neck swelling and facial swelling more frequently seen in malignant lesions. Sinonasal masses were found to be unilateral in 345(76.9%) and bilateral in 104 (23.1%) patients.

Table 1- Frequency of clinical symptom of sinonasal lesions in saint Paul hospital millennium medical college June 2018 to June 2023GC

	Responses		Percent of Cases
	N	Percent	
Nasal obstruction	313	39.3%	69.9%
Nasal mass	200	25.1%	44.6%
Nasal discharge	98	12.3%	21.9%
Epistaxis	73	9.2%	16.3%
Headache	30	3.8%	6.7%
Facial swelling	18	2.3%	4.0%
Loss of smell	16	2.0%	3.6%
Proptosis	15	1.9%	3.3%
Neck swelling	9	1.1%	2.0%
Nasal pain	6	0.8%	1.3%
Nasal ulceration	4	0.5%	0.9%
Ear discharge	4	0.5%	0.9%
Visual loss	3	0.4%	0.7%
Ear pain	3	0.4%	0.7%
Septal perforation	2	0.3%	0.4%
Hearing loss	2	0.3%	0.4%
Body weakness	1	0.1%	0.2%
	797	100.0%	177.9%

5.2.2. Duration before presentation

Duration of symptom before presentation was ranges from 1 to 240 months with a mean and median duration of 22.9 and 12 months respectively (SD = 33.204) (Table 2).

Table 2 - Duration of symptom in months with respect to subgroup of Histopathology diagnosis lesions in saint Paul hospital millennium medical college June 2018 to June 2023 GC

Histopathology diagnosis	Mean	Std. Deviation
Inflammatory and tumour like lesion	26.24	32.917
Benign lesions	24.74	36.352
Malignant lesions	13.75	28.384
Total	22.29	33.204

5.2.3. Anatomic site of sinonasal lesions.

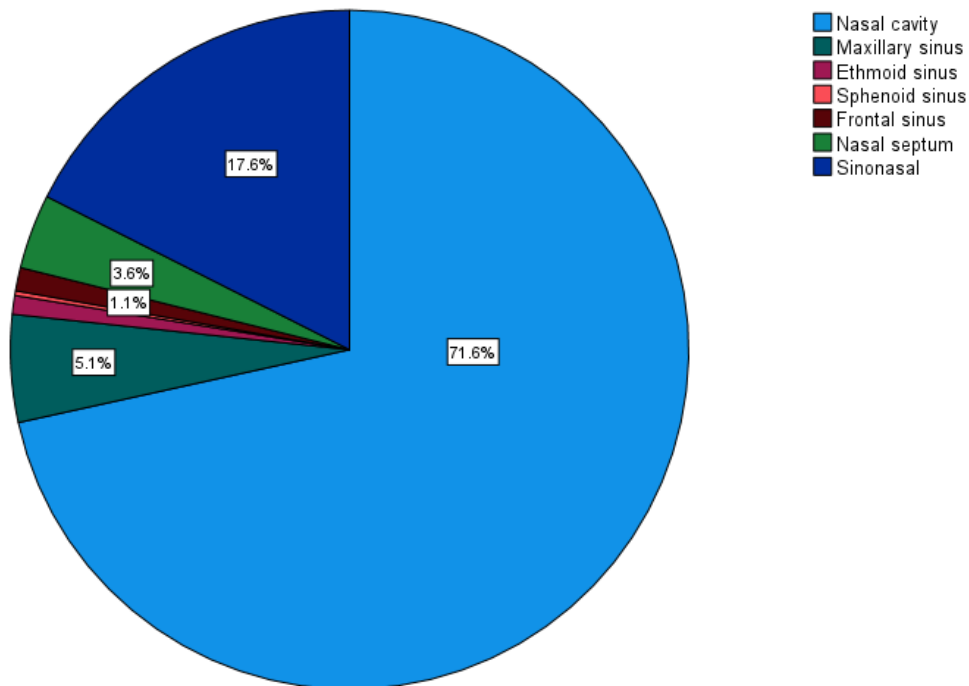


Figure 2 - Anatomic region of the sinonasal lesions in saint Paul hospital millennium medical college from June 2018 to June 2023 GC

5.2.4. Rhinoscopic finding of sinonasal lesions.

Among 450 cases 190 had Rhinoscopic finding data for analysis. The following results show a substantial correlation with the diagnosis of Histopathology: fleshy polypoid mass more often observed in malignant lesions, translucent polypoid mass and secretion typically detected in inflammatory and tumor-like lesions, and others in (Table 3).

Table 3- Frequency of Rhinoscopic finding among Histopathology diagnosis in saint Paul hospital millennium medical college from June 2018 to June 2023 GC

Rhinoscopic finding	Histopathology diagnosis			Total
	Inflammatory and tumour like lesion	Benign	Malignant	
Polypoid translucent mass	84	3	1	88
Fleshy polypoid mass	6	18	24	48
Secretion	28	7	2	37
Nasal septal deviation	10	4	9	23
polypoid with papillary excrescence	3	18	1	22
Pink-tan-grey polypoid mass	1	16	3	20
Congestion	8	0	1	9
Nasal septal perforation	1	2	4	7
Necrosis	4	1	2	7
Ulceration	1	1	4	6
Nasal bleeding	2	2	0	4
Total	105	54	31	190

5.2.5. Radiologic finding of sinonasal lesions

From 450 studied cases 216 cases have Radiologic data for analysis, except one case with MRI study all had CT scan. Soft tissue density lesion are common finding which account in 159 cases. Extracompartmental extension, bone destruction and regional pathologic lymphadenopathy are frequently seen finding in malignant neoplasm (Table 4).

Table 4- Frequency of Radiologic finding relative to Histopathology diagnosis lesions in saint Paul hospital millennium medical college June 2018 to June 2023 GC

Radiologic finding	Histopathology diagnosis			Total
	Inflammatory and tumour like lesion	Benign	Malignant	
Soft tissue density	72	41	46	159
Opacification	53	25	12	90
Mucosal thickening	50	11	7	68
Expanded sinus size	46	17	4	67
Enhancing	12	21	18	51
Bone destruction	8	7	33	48
Non enhancing	31	5	4	40
Extracompartmental extension	5	3	29	37
Heterogeneous enhancing	4	8	20	32
Fluid density	23	5	2	30
Bone remodeling	15	8	5	28
Eroded Sinus wall	11	9	4	24
Air fluid level	14	1	0	15
Mixed density	8	4	1	13
Regional significant lymphadenopathy	0	0	13	13
Internal calcification	5	5	2	12
Soft tissue with hyperdense sinus content	10	2	0	12
Bone sclerosis	8	3	0	11
Reduced sinus size	5	3	0	8
Hyperdensity	4	1	0	5
Periosteal reaction	2	1	1	4
Sclerotic wall	2	2	0	4
Lytic lesion	1	1	0	2
Total	113	51	50	214

5.2.6. Type of biopsy specimen

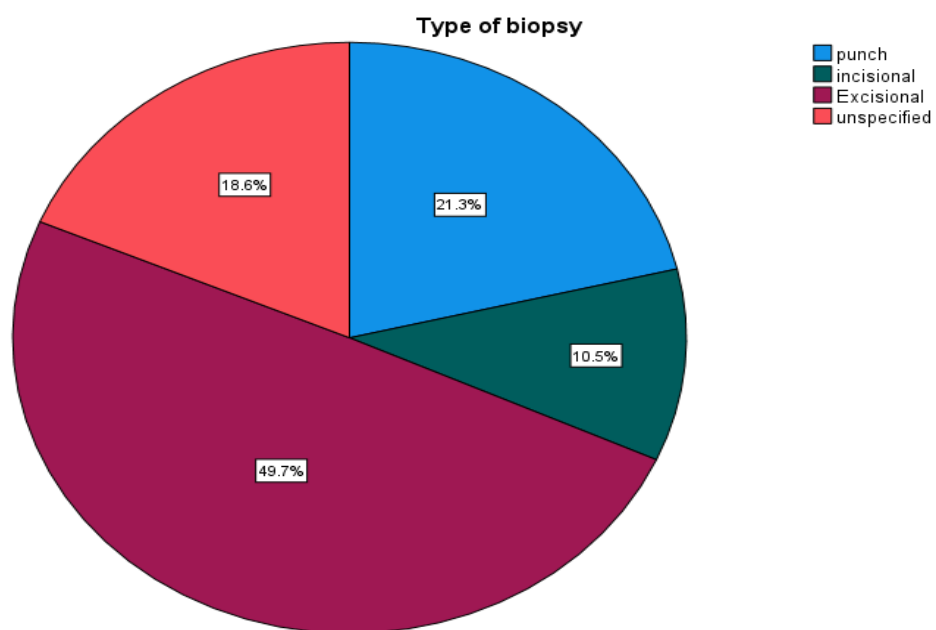


Figure 3 - Type of biopsy specimen of Sinonasal lesions in Saint Paul hospital millennium medical college from June 2018 to June 2023 GC

5.2.7. Histopathology diagnosis

The lesions were grouped into 3 categories: Inflammatory and tumor like, benign tumors and malignant tumors(Figure 4).

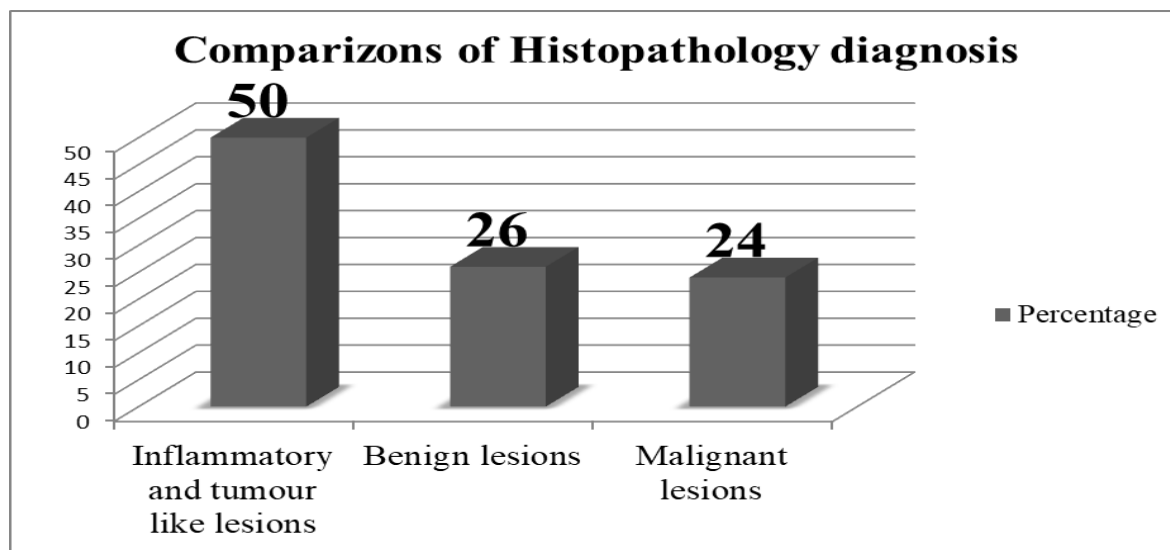


Figure 4 - Comparison between % of inflammatory and tumor like lesions, Benign and Malignant tumors(n=450) lesions in saint Paul hospital millennium medical college June 2018 to June 2023 GC

In the inflammatory and tumor like conditions, Inflammatory polyps including Allergic polyp, Anthrochoanal polyp and mucocele were the commonest lesions. Out of the 225 cases of inflammatory and tumor like lesions, there were 191 cases of Inflammatory polyps constituting 84.9 %, followed by Chronic Rhinosinusitis which include chronic nonspecific inflammation, Necrosis only, Xanthogranulomatous inflammation and one Tuberculosis cases and others (Table 5). Others category include lymphoid polyp and peripheral giant cell granuloma.

Table 5 Inflammatory and tumour like lesions in saint Paul hospital millennium medical college June 2018 to June 2023 GC

Lesions	Frequency	Percent
Inflammatory Polyp	191	84.9
Chronic rhinosinusitis	14	6.2
Rhinosporidiosis	5	2.2
Hamartoma not specified	4	1.8
Respiratory epithelial adenomatoid hamartoma	3	1.3
Fungal Rhinosinusitis	6	2.6
Others	2	0.8
Total	225	100.0

Out of the total of 450 cases, there were 119 cases of benign tumors. There were 47 cases of Sinonasal Papilloma constituting 39.6% followed by 28 cases of Haemangioma constituting 23.5% and 17 cases Angiofibroma constituting 14.3% and others(Table 6).

Table 6 Frequency of Benign lesions in saint Paul hospital
millennium medical college June 2018 to June 2023 GC

Lesions	Frequency	Percentage
Sinonasal papilloma	47	39.6
Hemangioma	28	23.5
Angiofibroma	17	14.3
Benign mesenchymal lesion	5	4.2
Juvenile psammomatous ossifying fibroma	4	3.4
Pleomorphic Adenoma	4	3.4
Squamous papilloma	4	3.3
Fibrous dysplasia	3	2.5
Osteoma	2	1.7
Benign peripheral nerve tumour	2	1.6
Others	3	2.5
Total	119	100.0

Hemangioma includes capillary hemangioma-21, Cavernous hemangioma-5, Epithelioid hemangioma- 2; Sinonasal papilloma includes inverted type -41, Oncocytic type- 4, Exophytic type-2, and Others category includes Dermoid cyst, Glomangiopericytoma Meningioma.

Among 450 studied cases 106 were malignant tumors. Squamous cell carcinoma was the commonest lesion in this group account for 28 cases(26.4%) and others(Table 7).

Table 7- Frequency of Malignant lesions in saint Paul hospital millennium medical college June 2018 to June 2023 GC

Lesions	Frequency	Percentage
Squamous cell carcinoma	28	26.4
Nasopharyngeal carcinoma	21	19.8
Mucosal Melanoma	9	8.5
Lymphoma	8	7.3
Rhabdomyosarcoma	6	5.7
Adenoid cystic carcinoma and other malignant salivary gland	10	9.4
Olfactory Neuroblastoma	3	2.8
Chondrosarcoma	3	2.8
Adenocarcinoma	5	4.7
Undifferentiated Malignancy	2	1.9
Ewing sarcoma	3	2.8
Miscellaneous malignant lesions	8	7.5
Total	106	100.0

Lymphoma includes NK/T cell lymphoma -3, Non Hodgkin Lymphoma-2, Diffuse large B cell lymphoma -1, Burkitt lymphoma- 1, High grade T cell lymphoma NOS -1; Squamous cell carcinoma includes one case of sinonasal papilloma with dysplasia, Adenocarcinoma includes Intestinal type-2, Non intestinal type-3; other malignant salivary gland tumour includes clear cell carcinoma- 2 and Mucoepidermoid carcinoma-1, and Miscellaneous malignant lesions includes Myeloid sarcoma, Adenosquamous carcinoma, Chordoma, Solitary fibrous tumour, Transitional sinonasal carcinoma, Plasmacytoma, Biphenotype low grade Sinonasal sarcoma and Kaposi sarcoma.

Mean age and St. deviation of Inflammatory and tumour like lesion, Benign lesions and malignant lesions 34.95(SD 17.14), 35.74(SD 15.770) and 44.59(SD 21.095) respectively.

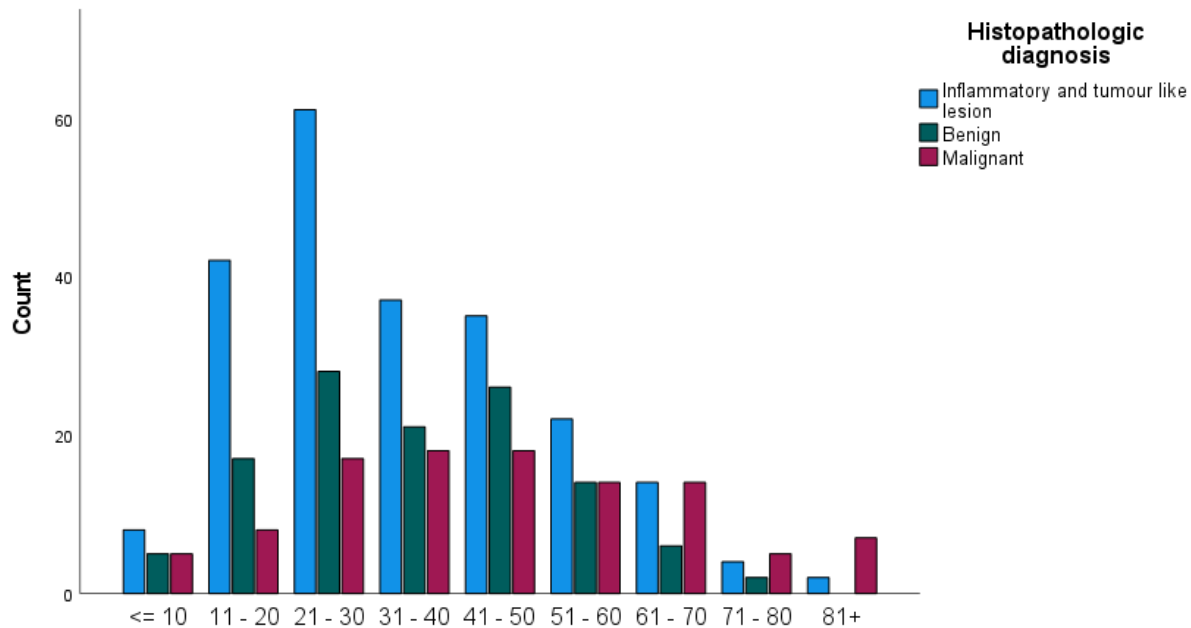


Figure 5 Histopathology diagnosis with age distribution in Saint Paul Hospital millennium medical college from June 2018 to June 2023 GC

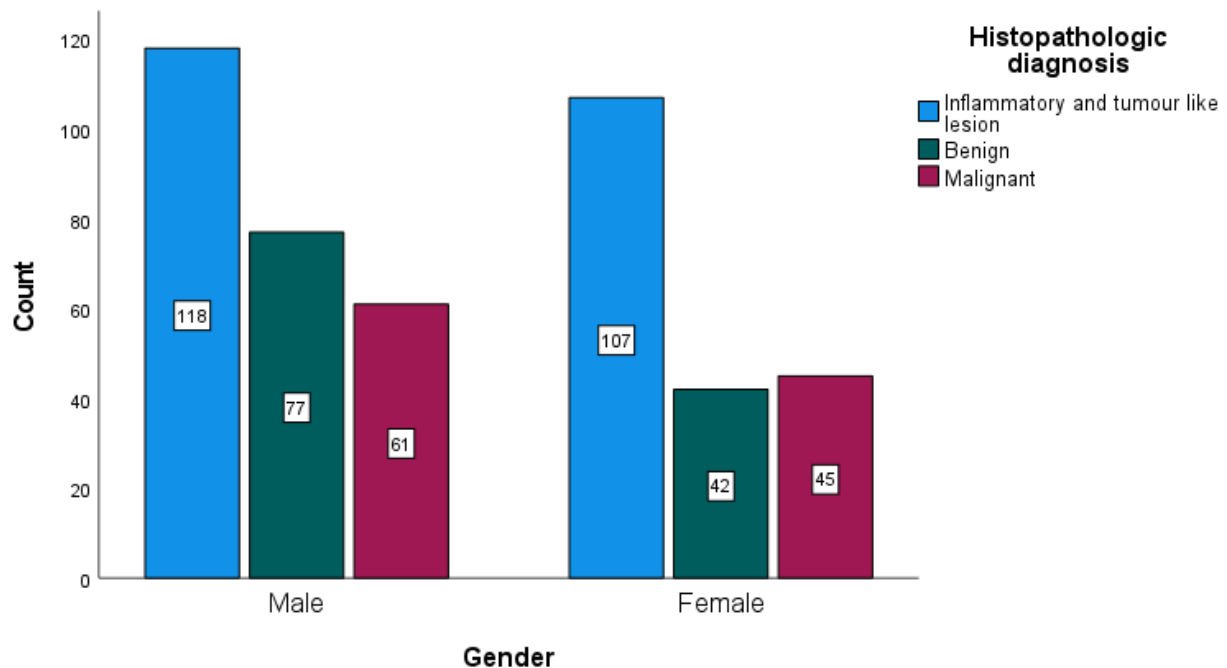


Figure 6 - Gender distribution of Sinonasal lesions in Saint Paul Hospital millennium medical college from June 2018 to June 2023 GC

5.2.8. Caparison of clinical, Radiology and Histopathology diagnosis

In this study, the comparison of the clinical and radiological findings with the histopathology diagnosis revealed that 150 cases (33%) out of 450 and 144(67%) patients out of 216 had findings that were comparable with the histology diagnosis. The results of the radiological and clinical examinations in the remaining patients were inconsistent or unclear. Eighty one percent of the time, the radiologic finding matches the clinical suspicion. Of the remaining cases, 234 lacked radiologic data for study.

Eighty six cases of clinically diagnosed as chronic rhinosinusitis and/or sinonasal polyposis, 72 of those cases turnout inflammatory and tumor-like lesions, 10 of which were benign, and 4 of which were malignant on Histopathology study. Five cases of a fungal infection that was clinically diagnosed turnout to be inflammatory polyps in 3 cases, one case of Aspergilloma, and

one more case of Squamous cell carcinoma. Four clinically recognized cases of Angiofibroma diagnosed into two cases of inflammatory polyps: one non-Hodgkin lymphoma and one squamous cell carcinoma. Seventeen cases of clinical inverted papilloma's were found out Sinonasal papilloma in 8 cases, two Hemangiomas, one Angiofibroma, two Rhinoporioidosis cases, and one squamous cell carcinoma case upon histology. Twenty-two of the 25 clinically identified malignant lesions had malignant histology, and three had inflammatory polyp histology

Twenty six of the 136 Radiologic inflammatory and tumor-like diagnoses proved to be benign lesions, and the other 8 were malignant based on histology. Based on histology, out of 24 benign radiologic diagnoses, 7 were inflammatory and tumor-like lesions, 12 were benign, and 5 were malignant. Among 16 radiography diagnosed inverted papilloma turnout malignant in 3 cases, 4 sinonasal papilloma, 6 cases Inflammatory polyp, 1 hemangioma, and other 2 benign lesions. Thirty four malignant, 10 benign, and 2 inflammatory and tumor-like lesions were diagnosed on histopathology out of 46 malignant radiographic diagnoses.

6. Discussion

The incidence sinonasal lesion was 1.7% of cases biopsied at in St. Paul Hospital Millennium Medical College from June 2018 to June 2023 GC. Study done at other surgical pathology shows the incidence of nasal, paranasal sinus and nasopharynx 3.06%(20).

The age ranged from 2 to 90 years (mean age of 37.43 years $\pm$ 18.219 SD), the peak frequency was seen in third decade of life with 106 (23.6%) patients. Similarly other observation shows age ranges from 2 to 79 years (mean age of 36.5 years $\pm$ 20.15 SD), the highest frequency was noted in third decade of life with 17 (21.52%) patients(12). Malignant lesions differed statistically significantly in age from other histopathology-diagnosed lesions. Malignant lesions typically develop later in life; the mean age is 44.59 (standard deviation: 21.095)($p < 0.001$). However there were no a discernible age difference between inflammatory and tumor-like lesions and benign lesions($p = 0.069$).

There were male preponderance with M: F ratio of 1.3:1 but statistically no significant correlation identified($P = 0.091$). It was comparable with other study which showed male to female ratio of 1.2:1(2)and 1.39:1(13). In contrast to the current study other observation shows M: F ratio of 1:1.2(21), this is due Angiofibroma cases which were high in current study.

Majority of the patients complain more than one symptom and the main presenting symptoms are nasal obstruction 69.9 %, nasal mass 44.6%, nasal discharge 21.6% nasal bleeding 16.3%. Similarly most of the patients presented with more than one symptom and nasal blockage was the commonest complaint noted in 65 patients (82.28%), followed by sensation of a mass in nose in 56 patients (70.89%)(12), nasal blockage 52.3% and nasal discharge 19.2%(3) and nasal obstructions was the commonest symptom seen in 47 (94%)cases(6).

Sinonasal lesions were found to be unilateral in 345(76.9%) and bilateral in 104 (23.1%) patients. This finding substantiated by other study showing (60/76) were unilateral and 16 patients had bilateral nasal masses(12) . Histopathology diagnosis shows statistically significant association with laterality. Malignant and benign lesions often develop unilaterally($p < 0.001$).

When compared to benign and malignant lesions, inflammatory and tumor-like lesions are more frequently bilateral($P<0.001$).

Duration of symptom before presentation was ranges from 1 to 240 months with a mean duration of 22.9 (SD = 33.204). It were short mean duration of presentation while comparing with previously reported observation which range of 1 to 240 months with a mean duration of 44.35 (± 59.595 SD) months(12), this due to high frequency of malignant lesions which tend to present early. Malignant lesions differed statistically significantly in duration of symptom from other histopathology-diagnosed lesions($P<0.001$). Malignant lesions typically present early; the duration of symptom is 13.75 (standard deviation: 28.384) in months. However there were no a discernible duration of presentation difference between inflammatory and tumor-like lesions and benign lesions($p=0.069$).

Rhinoscopic finding of nasal secretions and polypoid translucent mass significantly associated with inflammatory and tumour like lesions($P<0.05$). While fleshy polypoid mass shows statistically significant correlations with malignant lesions($P<0.001$).

Extracompartmental extension, bone destruction, enhancing lesions and regional pathologic lymphadenopathy shows significant statistical associations with malignant lesions($P<0.001$). This study was also supported by other studies, which found out small round cell tumours typically exhibit a permeative pattern of lytic bone lesions without frank destruction, high-grade malignancies are characterized by widespread bony destruction and regional lymphadenopathy, significant in malignant pathologies.(8)

In present study of 450 cases of sino-nasal lesions inflammatory and tumor like lesions were 50% (225 cases), benign tumors were 26.4 % (119 cases) and the malignant were 23.6 % (106 cases). Comparatively, in their study of 136 patients with sino-nasal masses, P. Agarwal et al.(2) reported 59.6% inflammatory and tumor-like lesions, 22.72% benign cases, and 11.7% malignant cases. Other observations also revealed inflammatory and tumor-like lesions, 68.56% benign lesions, and 8.71% malignant lesions (7)

Among inflammatory and tumour like Inflammatory polyp 191 cases(42.4%) constituted majority of the lesions followed by Chronic rhinosinusitis 14 cases(3.1%) and 5 cases Rhinosporiodiosis(1.1%). Similar observation shows Inflammatory polyp constitute majority of sinonasal mass, nasal polyp(51.38%)(7), Inflammatory nasal polyp(36.8%)(5), Rhinosporiodiosis(1.25%)(22), Rhinosporiodiosis(4.9%)(15).

Benign sino-nasal lesions constitute 26.4% (119 cases) of all sino-nasal masses, Sinonasal papilloma was the most common with 10.4 %(47 cases) of cases followed by Hemangioma with 6.2%(28 cases) of cases and Angiofibroma 3.8%(17 cases). Similarly Inverted papilloma was the most common benign lesion 7.1% (28 cases from 395 studied cases)(13). In other study Agarwal et al.(2) reported the 39 benign cases among 136 cases, hemangioma was the most common with 17 (12.5 %) cases followed by inverted papilloma with 12 (8.8 %) cases and Angiofibroma 3(2.2%).

Among 450 studied cases 106 were malignant tumors. Squamous cell carcinoma was the most common malignant lesion 28 cases(6.2%) followed by 21(4.7%) cases of Nasopharyngeal carcinoma, 9(2%) cases of Mucosal Melanoma, 6 (1.3%) cases Rhabdomyosarcoma, and 5(1.1%) cases Adenoid cystic carcinoma. Similarly study reported by Mahashwari (22) Squamous cell carcinoma was the most common malignant lesion 13.75%(11 cases among 80 studied cases). In order to identify distinct malignant lesions, further ancillary tests are required for two undifferentiated malignancies.

Comparison of clinical and radiological findings with Histopathology diagnosis in this study showed that there were 150(33%) cases from 450 and 144 (67%) patients out of 216 in whom the Clinical and radiological findings were comparable with Histopathology diagnosis respectively. In the remaining cases either the clinical and radiological findings were different or inconclusive. Radiologic finding consistent with clinical suspicion in 81% cases. Similarly other study shows radiological findings consistent with the clinical suspicion in (83.07 %)(15).

7. Conclusion, Limitation, and Recommendation

7.1. Conclusion

The masses in nasal cavity and paranasal sinuses encompass a wide spectrum of common and rare diseases and are very common lesions encountered in clinical practice. Bizarre pattern of symptoms causes delayed diagnosis. Indeed, the average period of time from the initial presentation of symptoms to the time of a definitive diagnosis is almost 22.90 months. In the present study, the most affected age group was 21– 50 years with over all M: F ratio of 1.3:1. Inflammatory and tumor like lesions were the commonest constituting 50.0% of the total cases, followed by benign tumors constituting 26.4% and malignant tumor constituting 23.6% of the cases. The main presenting symptoms are nasal obstruction 69.9 %, nasal mass 44.6%, nasal discharge 21.6% and nasal bleeding 16.3%. Proptosis, neck swelling and facial swelling more frequently seen in malignant lesions. Sinonasal masses were found to be unilateral in 76.9% and bilateral in 23.1% patients. This study found out that there were 33% and 67% in whom the Clinical and radiological findings were comparable with Histopathology diagnosis respectively. Radiologic finding consistent with clinical suspicion in 81% cases. Clinical and radiologic diagnosis of specific lesion were quite challenging, histopathology evaluation with clinicoradiological correlation are crucial to settle specific diagnosis and management of patients accordingly. Awareness regarding the disease process and health education should be provided to people regarding the clinical presentation and medical seeking behavior.

7.2. Limitation

- Lack of ancillary test and special stain for few case.
- Absent research references conducted in Ethiopia
- In certain cases, there are no radiologic and rhinoscopic findings

7.3. Recommendation to Pathology department, Saint Paul hospital millennium medical college and health professions dealing with sinonasal lesions.

In light of research finding, it is strongly recommended clinical including Endoscopic finding, Radiologic finding and Histopathology finding correlation in the diagnosis and management of sinonasal lesions, to Pathology Resident, Pathologist, Ear Nose and Throat surgeon and Resident and other physician and health profession dealing with sinonasal lesions.

Basic immunohistochemistry and special stain for diagnosis to Pathology department and saint Paul hospital millennium medical college.

Further Hospital based multidisciplinary participating study which include assessment of risk factor, management and outcome to Saint Paul Hospital millennium medical college.

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9. Annexes

Self-prepared questionnaires.

Part1:-Socio Demographic characteristics			
code	Variables	Response category	Remark
	Questioner number		
	SP number		
	MRN		
101	Age		
102	Gender	1, Male 2. Female	
PART II: Clinic pathologic profile of Sino nasal lesions			
105	Chief complaint	1. Nasal mass 2. Nasal obstruction 3. Nasal discharge 4. Epistaxis 5. Loss smell 6. Headache 7. Facial swelling 8. Others (specify)	
106	Duration of symptom in month		
107	Anatomic region	1. Nasal cavity	

	of the mass	2. Maxillary sinus 3. Ethmoid sinus 4. Sphenoid sinus 5. Frontal sinus 6. Nasal septum	
108	Rhinoscopic study	1. Yes 2. No	
109	Rhinoscopic finding		
110	Clinical diagnosis		
111	Radiologic study	1. Yes 2. No	
112	Type of Radiologic imaging	1. CT scan 2. MRI 3. Plain X-ray 4. Ultrasonography 5. Others	
113	Radiologic finding		
114	Radiologic diagnosis		
115	Tumour size in cm		

116	Type of biopsy	1. Punch biopsy 2. Incisional biopsy 3. Excisional biopsy 4. Unspecified biopsy	
117	Histopathologic pattern	1. Inflammatory and tumour like lesion(Specify) 2. Benign(Specify) 3. Malignant (Specify)	
118	comment		

10. Assurance of Principal Investigator

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project and for provision of required progress reports as per terms and conditions of the requirements of the department. I will provide timely progress reports to my advisors and seek necessary advice and approval from my advisors in the course of the research.

Name of the student: Nesha Ahmed Aman

Signature: _____

Date: _____

Approval of the Primary Advisor

Name of the primary advisor: Dr. Daselew Gedamu

Signature: _____

Date: _____

Approval of the Co-Advisor

Name of the primary advisor: Mr. Samson Zageye

Signature: _____

Date: _____