Journal of Cardiovascular Disease Research

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

Original research article

Analysis of spectrum of neoplastic lesions of nasal cavity and paranasal sinuses

[1]R Babu Srijan, [2]P Vijaya Praveen Kumar, [3]Sabbineni Ramya, [4]PV Ramana

[1,3]Senior Resident of Pathology, Govt. Medical College, Nalgonda, Telangana, India

[2]Assistant Professor of Pathology, Govt. Medical College, Nalgonda, Telangana, India

[4]Associate Professor of Pathology, Govt. Medical College, Nalgonda, Telangana, India

Corresponding Author:

Dr. P. Vijaya Praveen Kumar (vijaypraveenpedakotla@gmail.com)

Abstract

Background: Lesions of nasal cavity and paranasal sinuses are commonly encountered clinically and it is quite difficult to distinguish clinically the polyps arising from inflammatory conditions with those of neoplastic origin. Though malignant lesion of nasal and paranasal cavities account for less than 1% of all malignant lesions and less than 3% of head and neck region malignancies, they cause frequent local recurrence and relatively great morbidity. Even the advance imaging techniques help to reach presumptive diagnosis only, whereas the histopathological diagnosis remains the main stay in arriving at definitive diagnosis.

Materials and Methods: The present study was done on 92 cases of neoplastic lesions received at department of pathology, Government ENT Hospital, Hyderabad from November 2019 to October 2021 as prospective observational study. Received biopsy specimens are routinely processed, section cutting done and stained with Hematoxylin and Eosin stain. All the neoplastic lesions of nasal cavity and paranasal sinuses of all age groups are included and inflammatory lesions, foreign body inclusions are excluded from the study.

Results: Out of 92 neoplastic lesions, 58 cases are benign and 34 cases are malignant. Out of 92 cases, 61 patients are male and 31 patients are female. Majority of the cases are seen in 4th and 3rd decades. Among males most of the cases are seen in 4th and 5th decades whereas in females they are seen in 3rd decade. Out of 58 benign neoplastic lesions, most common cases are of lobular capillary hemangioma that represents 50% and are followed by Schneiderian papilloma representing about 29%. Out of 34 malignant neoplastic lesions, squamous cell carcinomas are the most common and represent about 41% incidence. Undifferentiated Carcinomas and Lymphoproliferative Disorders are second common with similar incidence of 12%.

Conclusion: Lesions of nasal cavity and paranasal sinuses are commonly encountered in clinical practice and they give rise to a variety of histological patterns. The inflammatory and infectious conditions at these locations share overlapping features with benign and malignant lesions both clinically and radiologically, where only a presumptive diagnosis can be made. The histopathological examination remains the definitive diagnostic method for timely and accurate intervention in patient management.

Keywords: Nasal cavity, paranasal sinuses, polyp, neoplasm

Introduction

Lesions of nasal cavity and paranasal sinuses are commonly encountered in clinical practice as they give rise to a variety of histological patterns and grades of malignancies [1]. Clinically, it becomes quite impossible to distinguish between inflammatory conditions presenting as simple polyps and polypoid neoplasms. Therefore, it becomes important that all polyps and polypoidal lesions should be submitted for histopathological examination [2].

Even though these malignant neoplasms have extremely low incidence, they have a long clinical history with frequent local recurrence and they cause relatively great amount of morbidity. The lesions of nose and paranasal sinuses account for less than 1% of all malignant tumors and not more than 3% of the head and neck region malignancies [3]. The nose and paranasal sinuses are exposed to a variety of infections, chemically irritating, antigenically stimulating, traumatic and many other influences and consequences of these exposures result in the formation of tumor-like and truly neoplastic conditions [4].

Lesions often present as nasal obstruction, nasal discharge, epistaxis, facial swelling, orbital and ear symptoms, or simply as nasal mass [5]. These lesions often have clinical and radiological features

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

overlapping with certain inflammatory conditions such as fungal sinusitis [6]. It is impossible to distinguish simple nasal polyps from neoplastic polypoidal lesions by clinical, radiological and endoscopic modalities, where histopathology becomes the mainstay of definitive diagnosis [7].

Materials and Methods

The present study was done on 92 cases of neoplastic lesions received at department of pathology, Government ENT Hospital, Hyderabad from November 2019 to October 2021 as prospective observational study. All the neoplastic lesions of nasal cavity and paranasal sinuses of all age groups are included and inflammatory lesions, foreign body inclusions, inadequate biopsies, biopsies done for non-neoplastic lesions were excluded from the study. One micro section of 5µm thickness is prepared from the corresponding paraffin blocks, taken on an albumin coated slide for Hematoxylin and Eosin staining.

Observation and Results

In the present study, out of 92 cases of sino-nasal lesions, 58 cases were benign and 34 cases were malignant in the ratio of 1.7 : 1. In this study 61 cases were males and 31 cases were females in the ratio of 1.96 :1.

Age of patients ranged from 09 to 75 years. Majority of cases were seen in the 4th and 3rd decades. Among males, most of the cases were seen in 4th decade and 5th decade equally, while in females majority were seen in 3rd decade.

In the present study, the most common clinical presentation was nasal mass in about 50% of cases, followed by nasal obstruction in 37% cases.

Out of 58 benign neoplastic lesions, most common cases were of lobular capillary hemangioma that represent 50% and were followed by Schneiderian papilloma accounting for 29%. Out of 34 malignant neoplastic lesions, squamous cell carcinomas are the most common and represent about 41%. Undifferentiated carcinomas and lymphoproliferative disorders are second most common with similar incidence of 12%.

In the benign neoplasms, lobular capillary hemangiomas are seen most commonly during 2nd and 4th decades. Schneiderian papilloma are commonly seen during 7th decade. In the malignant neoplasms, the most common age group in which squamous cell carcinomas are seen in 6th decade. Lymphoproliferative disorders are most commonly seen in 4th decade, whereas undifferentiated carcinomas are seen in 7th decade.

Table 1: Age distribution in neoplastic lesions

Age group	Total cases	Female	Male
0-10	5%	10%	3%
11-20	11%	3%	14%
21-30	17%	28%	11%
31-40	22%	25%	21%
41-50	15%	3%	21%
51-60	13%	13%	13%
61-70	13%	9%	15%
71-80	4%	9%	2%

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

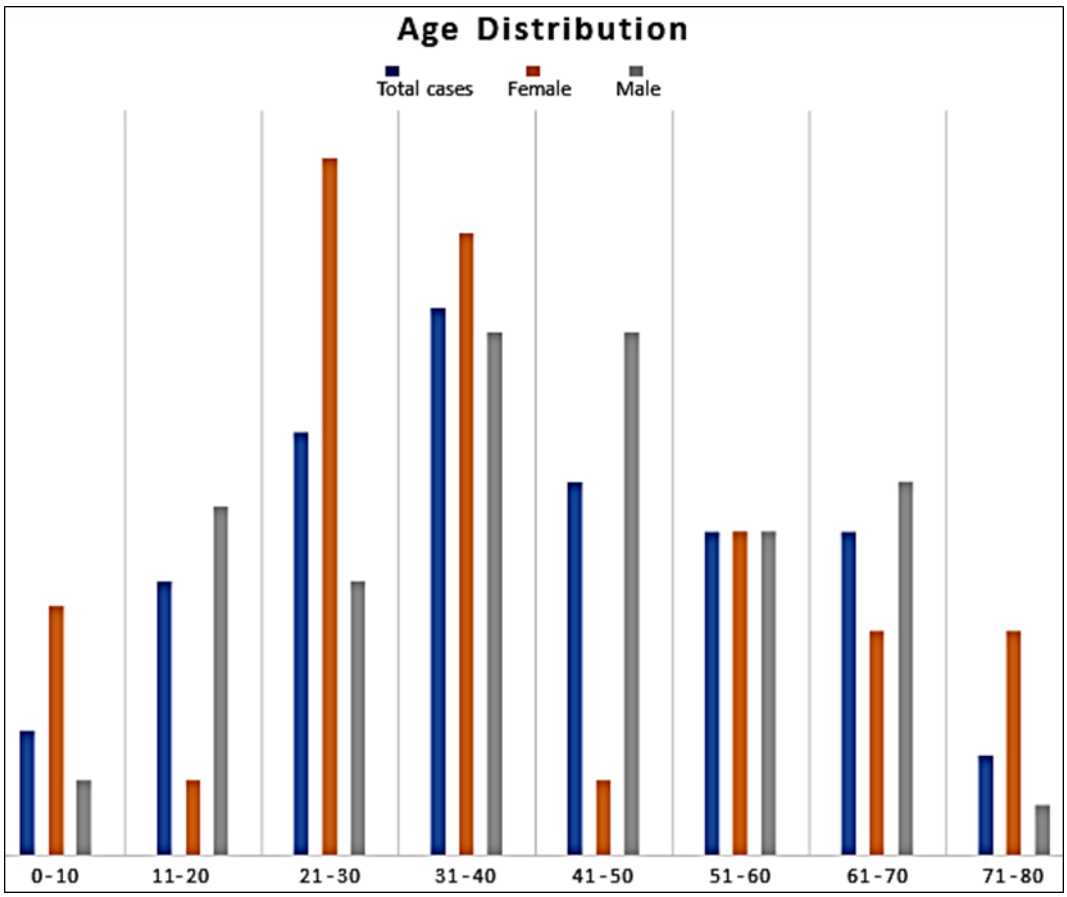

Chart 1: Age distribution in neoplastic lesions

Table 2: Distribution of Benign Lesions

Distribution of Benign Lesions	Total	Percentage
Lobular Capillary Hemangioma	29	50%
Schneiderian Papilloma	17	29%
Benign Fibro-osseus Lesion	7	12%
Squamous Papilloma	3	5%
Schwannoma	2	4%

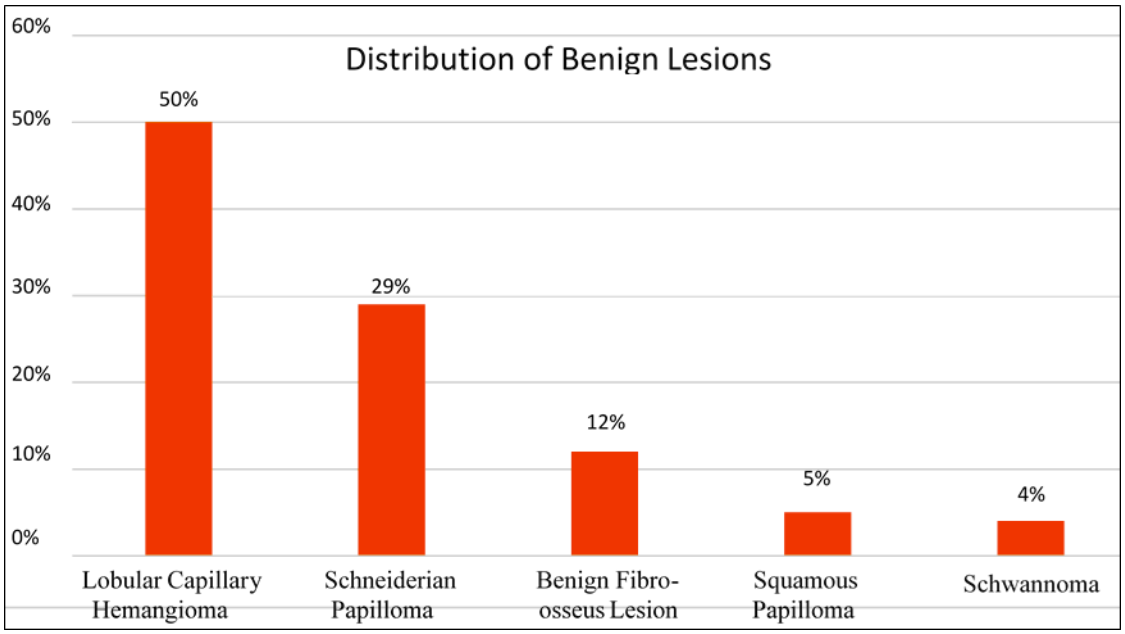

Chart 2: Distribution of Benign lesions

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

Table 3: Distribution of malignant lesions

Distribution Of Malignant Lesions	Total	Percentage
Squamous Cell Carcinoma	14	41%
Lymphoproliferative Disorder	4	12%
Undifferentiated Carcinoma	4	12%
Primitive Neuroectodermal Tumor	3	9%
Olfactory Neuroblastoma	2	6%
Rhabdomyosarcoma	2	6%
Malignant Neoplasm of Minor Salivary Gland	2	6%
Malignant Spindle Cell Neoplasm	2	6%
Sclerosing Epithelioid Fibrosarcoma	1	2%

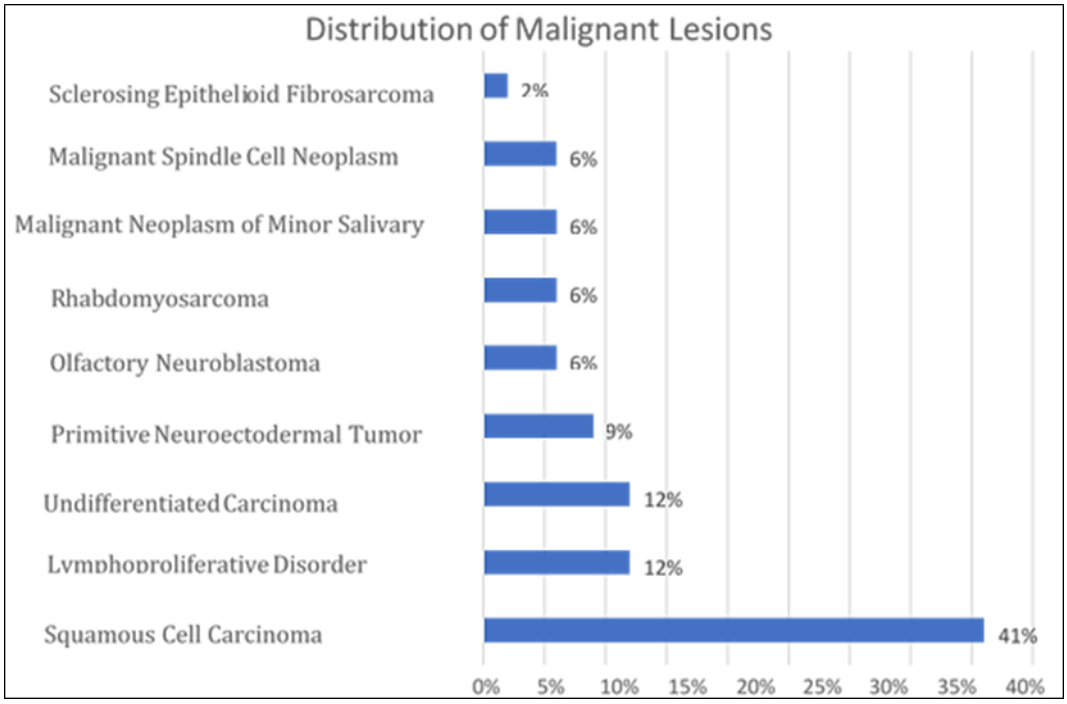

Chart 3: Distribution of Malignant Lesions

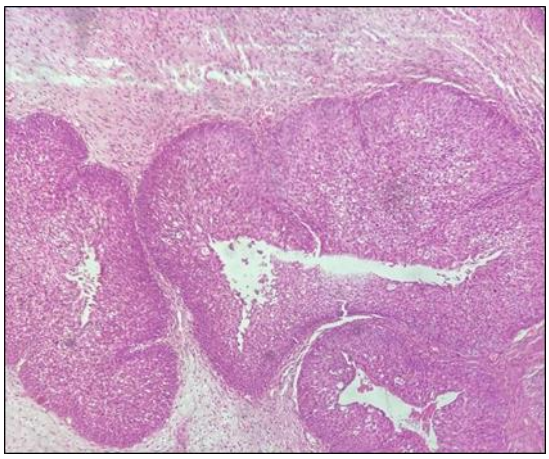

Fig 1: Schneiderian Papilloma 10X H&E

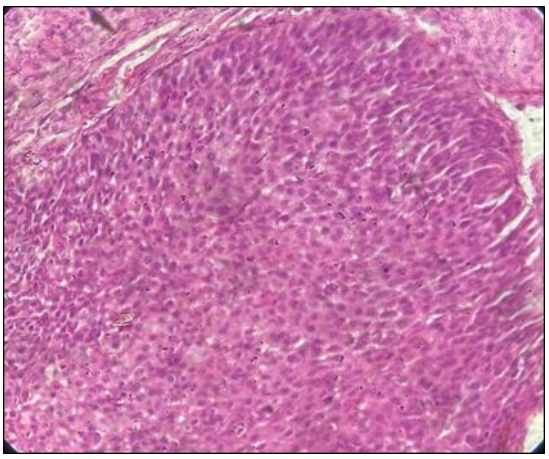

Fig 2: Schneiderian Papilloma 40X H&E

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

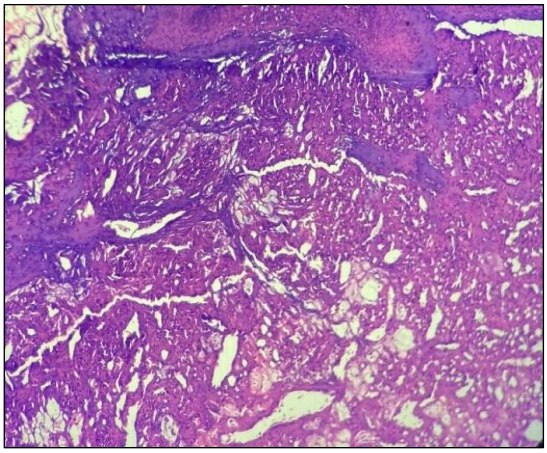

Fig 3: Lobular Capillary Hemangioma 10X H&E

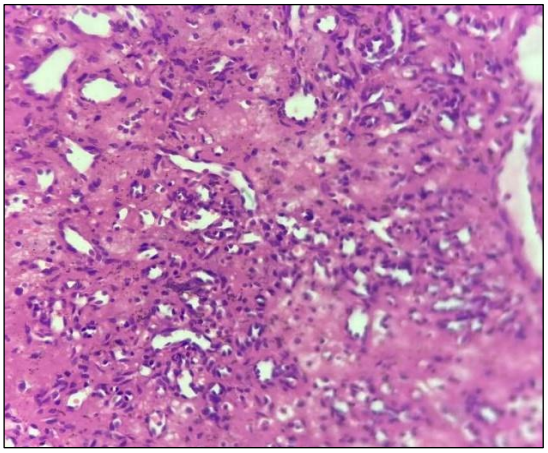

Fig 4: Lobular Capillary Hemangioma 40X H&E

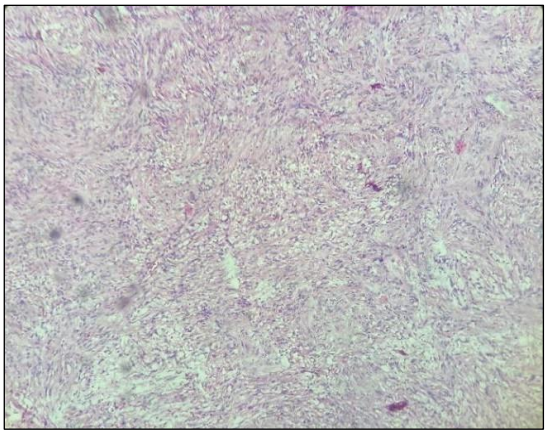

Fig 5: Schwannoma 10X H&E

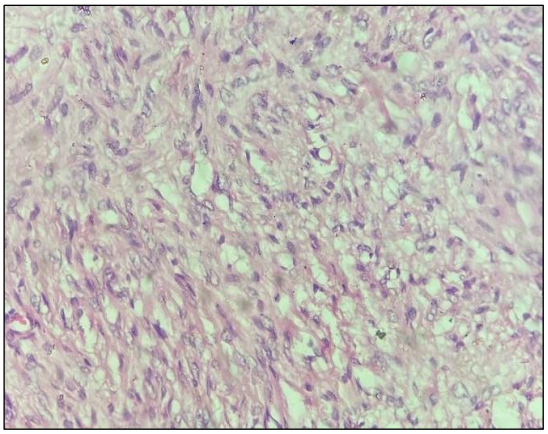

Fig 6: Schwannoma 40X H&E

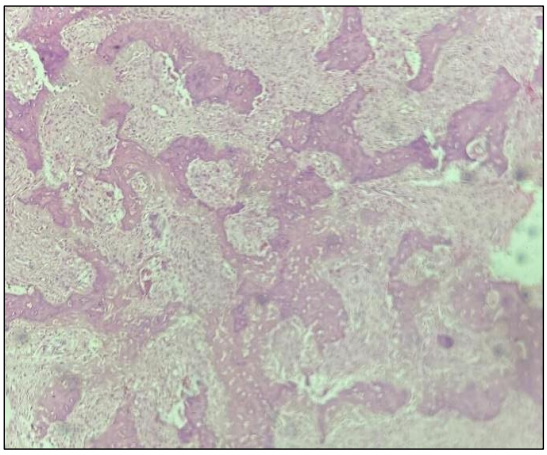

Fig 7: Benign Firbro-osseus Lesion 10X H&E

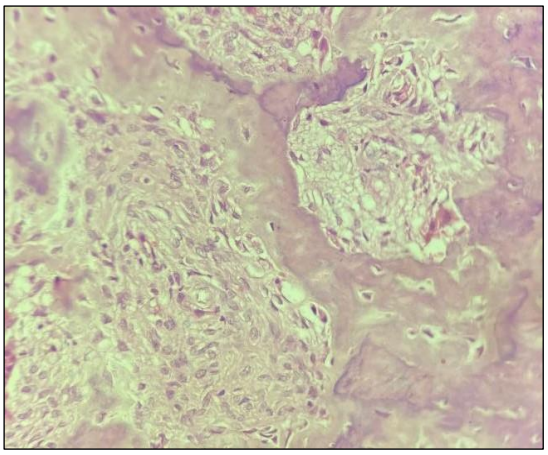

Fig 8: Benign Firbro-osseus Lesion 40X H&E

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

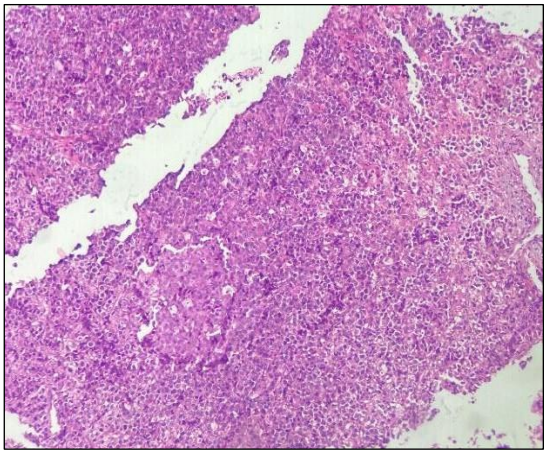

Fig 9: Lymphoma 10X H&E

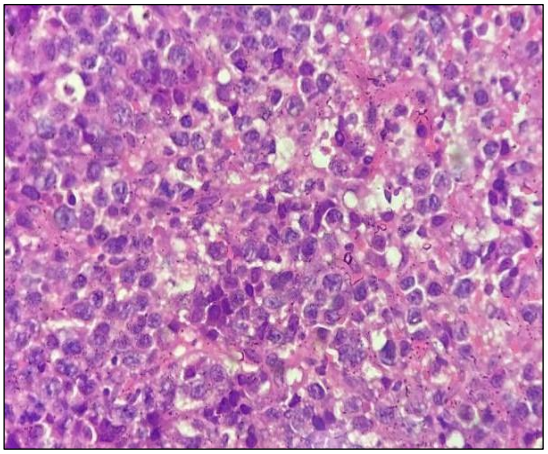

Fig 10: Lymphoma 40X H&E

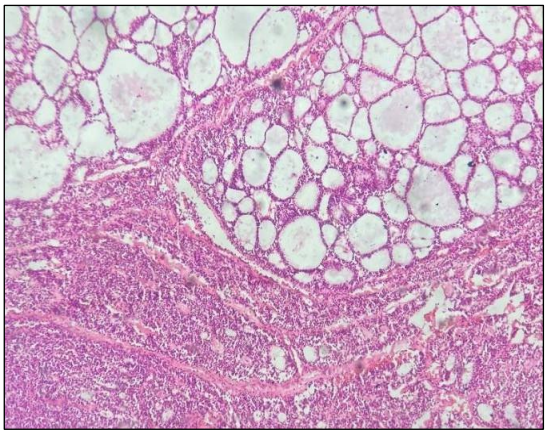

Fig 11: Malignant Neoplasm of Minor Salivary Gland 10X H&E

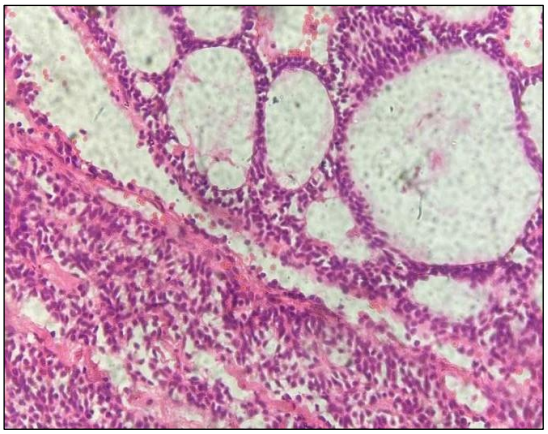

Fig 12: Malignant Neoplasm of Minor Salivary Gland 40X H&E

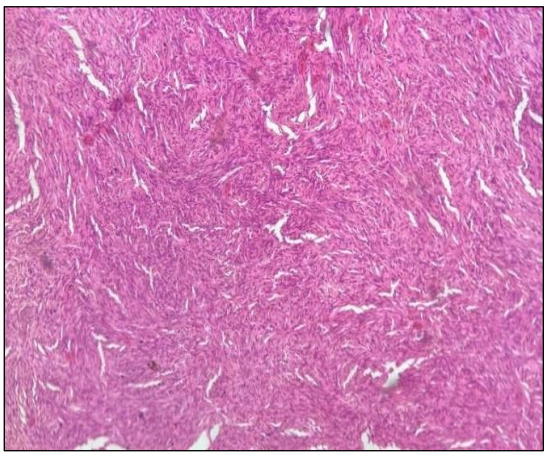

Fig 13: Malignant Spindle Cell Neoplasm 10X H&E

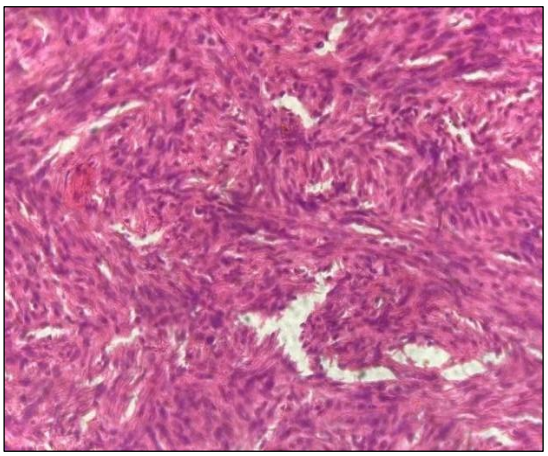

Fig 14: Malignant Spindle Cell Neoplasm 40X H&E

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

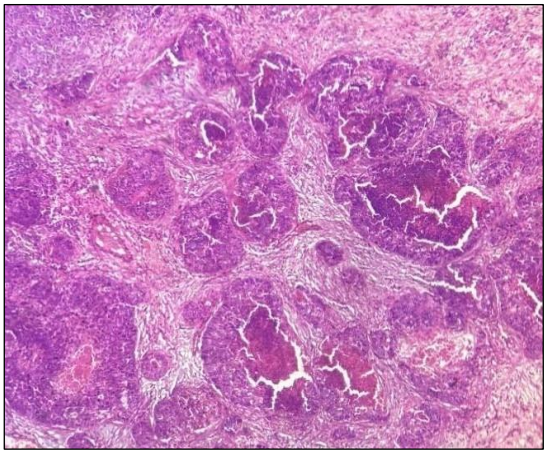

Fig 15: Olfactory Neuroblastoma 10X H&E

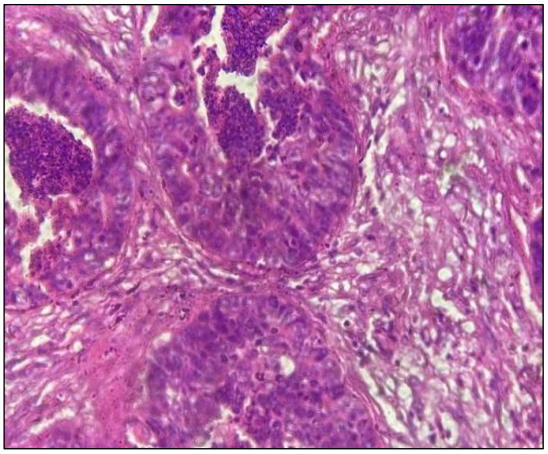

Fig 16: Olfactory Neuroblastoma 40X H&E

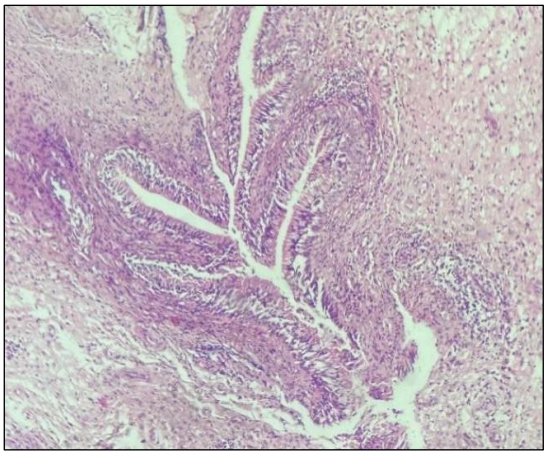

Fig 17: Primitive Neuroectodermal Tumor (PNET) 10X H&E

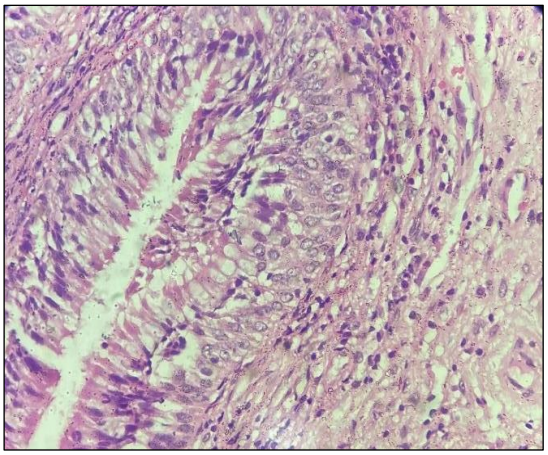

Fig 18: Primitive Neuroectodermal Tumor (PNET) 40X H&E

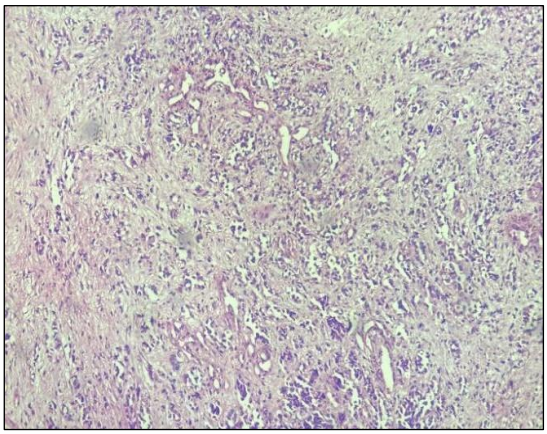

Fig 19: Rhabdomyosarcoma 10X H&E

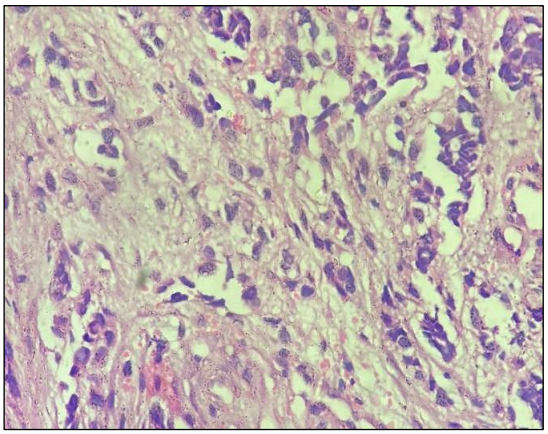

Fig 20: Rhabdomyosarcoma 40X H&E

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

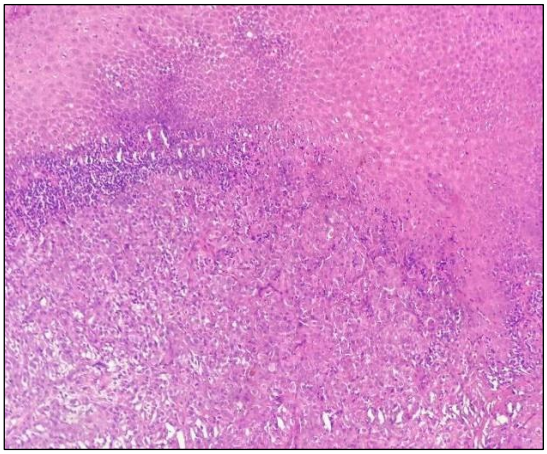

Fig 21: Squamous Cell Carcinoma 10X H&E

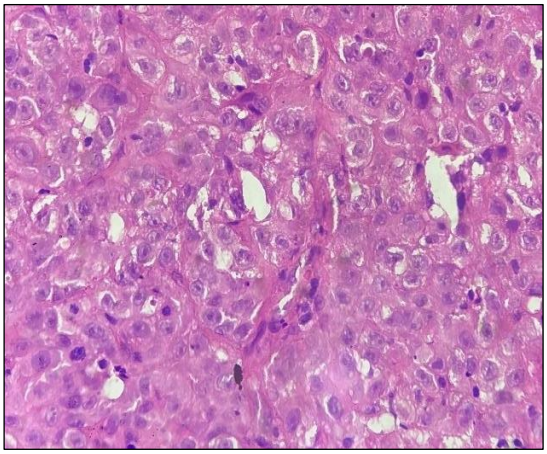

Fig 22: Squamous Cell Carcinoma 40X H&E

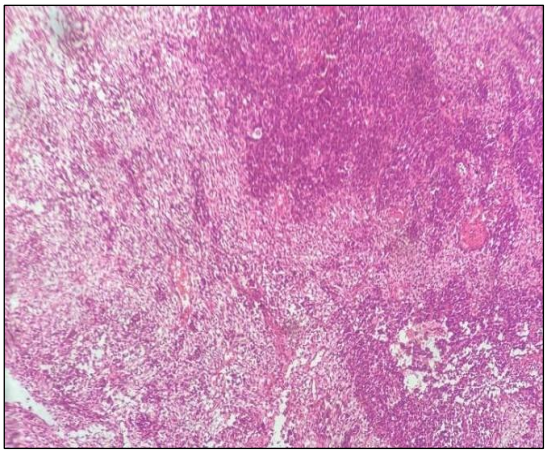

Fig 23: Sino-nasal Undifferentiated Carcinoma 10X H&E

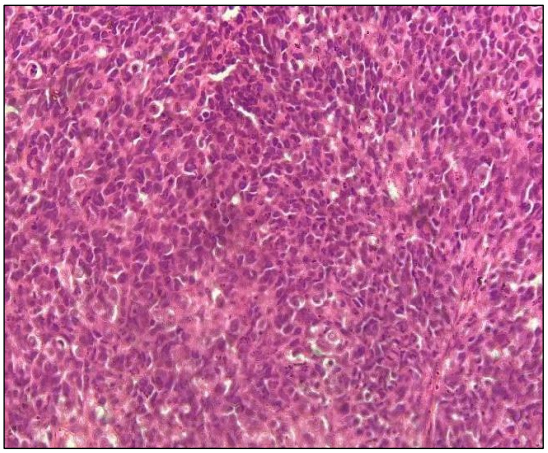

Fig 24: Sino-nasal Undifferentiated Carcinoma 40X H&E

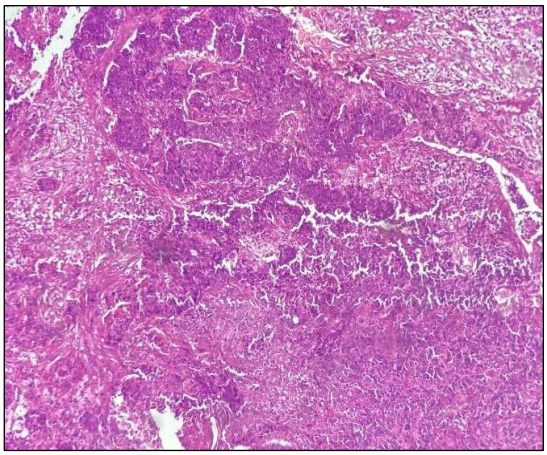

Fig 25: Sclerosing Epithelioid Fibrosarcoma 10X H&E

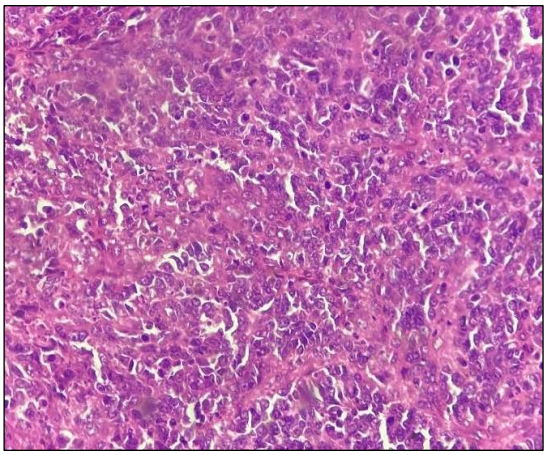

Fig 26: Sclerosing Epithelioid Fibrosarcoma 40X H&E

Discussion

Nasal polypoidal masses form a complex group of lesions with a broad range of histopathological characteristics [8]. Histopathological examination of these polypoidal masses shows a spectrum of lesions ranging from non-neoplastic to neoplastic tumors, including benign and malignant neoplasms [9, 10].

Sino nasal masses give rise to clinical symptoms such as nasal fullness, anosmia, nasal discharge, etc.

As a predisposing factor to sino-nasal malignancies exposure to wood, dust, textile or leather dust, nickel and isopropyl oils was implied [11]. Unlike other regions of the head and neck (e.g. oral cavity and larynx) where tumorigenesis is mainly due to the carcinogenic effects of tobacco use, cigarette smoking is not closely associated with carcinomas occurring in the sino nasal tract [12, 13].

The present study analyzed the histopathological pattern of various sino-nasal lesions in relation to age and sex of patients. The present study was carried over in the Department of Pathology, Government

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

ENT hospital, Hyderabad.

Out of 92 neoplastic lesions, there were 61 males and 31 females. The male to female ratio was 1.96:1. This data clearly points out a male predominance in these lesions which is almost more than 2 times. This observation is consistent with Dinesh *et al.* [14], with male to female ratio of 1.98:1. There is male preponderance with male to female ratio of 1.53:1 which was same as that observed by Khan *et al.* [15] and Dasgupta *et al.* [16].

In the present study, out of 92 cases largest age group affected being 31-40 years (22%). The next largest group was in the age range of 21-30 years (17%). The most vulnerable period was 3rd decade followed by 2nd decade of life. Similar age incidence was noted by Bakari *et al.* [17] where largest age group was during second decade. In the study of Lathi *et al.* [18] age incidence was also similar with present study but Kulkarni *et al.* [19] found lower mean age of 22.5 years.

Out of 92 cases of sino-nasal lesions, 58 cases were benign and 34 cases were malignant. Out of 58 cases with benign sino-nasal lesions, the most common sino-nasal lesion was Lobular Capillary Hemangioma seen in 29 cases (50%) followed by Schneiderian Papilloma (29%) and least common are schwannomas (4%). Lobular Capillary Hemangioma incidence in the present study is similar with incidence of 40.62% in the study of Prashant *et al.*, [20] and 38.46 % incidence in the study of Kulkarni *et al.* [19] In the study of Parajuli *et al.*, [21] incidence was 26.31%. Schneiderian Papilloma incidence is about 29% in the present study which correlates with 31.57% incidence of Parajuli *et al.* [21] The incidence was higher with 45.46% in the study of Dinesh *et al.*, [22] and 36.36% in the study of Nisha *et al.* [23]

Out of 92 cases, 34 cases are malignant sino-nasal lesions. The commonest malignant lesion in this study was squamous cell carcinoma seen in 14 cases (41%). Undifferentiated carcinoma cases were 12% and lymphoproliferative disorders were of 11% and least common was sclerosing epithelioid fibrosarcoma with an incidence of 3%. Undifferentiated Carcinoma accounts for 12% in the present study which is consistent with 12.50% incidence in the study of Bhattacharya *et al.*, [24] and 17.85% incidence in the study of Vartak *et al.* [25] Lymphoproliferative disorder amounts to 11% in the present study which is consistent with 10% incidence in the study of Prashant *et al.*, [20] whereas 30% incidence seen in the study of Parajuli *et al.* [21].

Table 4: Comparison of Type of Sino-nasal Neoplasms of present study with other study

Sino-nasal Neoplastic Lesions	Present study (cases)	Charu Chandra, *et al.* [26] (cases)
Benign	63%	54%
Malignant	37%	46%

Table 5: Comparison of age groups of benign and malignant Sino-nasal lesions of present study with other study

Age groups in years	Present study (cases)	Dinesh et al[22] (Cases)
0-10	5%	5.7%
11-20	11%	34.28%
21-30	17%	28.57%
31-40	22%	14.28%
41-50	15%	11.42%
51-60	13%	5.71%
61-70	13%	0%
71-80	4%	0%

Table 6: Comparison of benign Sino-nasal lesions of present study with other studies

Benign Sino nasal Lesions	Present study (cases)	Kulkarni *et al.* [19] (Cases)
Lobular Capillary Haemangioma	50%	41%
Schneiderian Papilloma	29%	32%
Benign Fibro Osseus Lesion	12%	15%
Squamous Papilloma	5%	7%
Schwannoma	4%	5%

Table 7: Comparison of malignant sino-nasal lesions of this study with other studies

Malignant Sino nasal lesions	Present study (cases)	Vartak *et al.* [25] (cases)	Prashanth *et al.* [20] (cases)
Squamous Cell Carcinoma	41%	29%	30%
Lymphoproliferative Disorder	11%	7%	10%
Undifferentiated Carcinoma	12%	18%	-
Primitive Neuroectodermal Tumor	9%	-	-
Olfactory Neuroblastoma	6%	11%	15%
Rhabdomyosarcoma	6%	-	-
Malignant Neoplasm of Minor Salivary Gland	6%	3%	10%
Malignant Spindle Cell Neoplasm	6%	-	5%
Sclerosing Epitheloid Fibrosarcoma	3%	-	-

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

Others	-	32%	30%

Conclusion

Lesions of nasal and paranasal sinuses are commonly encountered in clinical practice as they give rise to a variety of histological patterns and grades of malignancies. Because of overlapping presentations of more commonly encountered inflammatory and infectious diseases with benign and malignant lesions both clinically and radiologically, only a provisionally diagnosis can be made in most of the cases. So it can be concluded that histopathological evaluation is mandatory in all cases of sino-nasal masses and mainstay for accurate diagnosis and timely intervention for patient management.

References

1. Wenig BM, Pilch BZ. Tumors of upper respiratory tract. In: Fletcher Christopher DM, editor. Diagnostic Histopathology of Tumours. 3rd ed. Elsevier Ltd. 2007;1:83-149.
2. Agrawal P, Panigrahi R. Sino-nasal Masses-a Recent Study of Its Clinicopathological Profile. Indian J Surg Oncol. 2017;8(2):123-127. Doi: 10.1007/s13193-016-0570-9.
3. Settipane GA. Epidemiology of nasal polyps. Allergy Asthma Proc. 1996;17:231.
4. Kumar V, Abbas AK, Fausto N, Aster JC. Robbins and Cotran pathologic basis of disease, professional edition e-book. Elsevier health sciences, 2014 Aug.
5. Jaison J, Tekwani DT. Histopathological lesions of nasal cavity, paranasal sinuses and nasopharynx. Ann Appl. Bio Sci. 2015;2:40-6.
6. Lingen MW, Kumar V. Robbin's and Cotran Pathologic Basis of Disease. 7th ed. Philadelphia: Elsevier Inc. Head and Neck. In: Kumar V, Abbas AK, Fausto N, editors; c2005. p. 783.
7. Friedmann I. Inflammatory conditions of the nose. In: Symmers WSTC, ed. Nose, throat and Ears. 3rd ed. Edinburgh: Churchill Livingstone.1986;19-23.
8. Chakrabarti A, Das A, Panda NK. Overview of fungal rhinosinusitis. Indian J Otolaryngol Head Neck Surg. 2004;56:251-8.
9. Challa S, Uppin SG, Hanumanthu S, Panigrahi MK, Purohit AK, Sattaluri S, *et al*. Fungal rhinosinusitis: A clinicopathological study from South India. Eur Arch Oto-rhinolaryngol. 2010;267:1239-45.
10. Kirtsreesakul V. Update on Nasal Polyps: Etiopathogenesis. J Med Assoc Thai. 2005;88(12):1966-1972.
11. Dutta R, Ba PMD, Svider PF, Liu JK, Baredes S, Eloy JA. Sinonasal malignancies: A population-based analysis of site-specific incidence and survival. Laryngoscope. 2015;125:2491-2497.
12. Turner JH, Reh DD. Incidence and survival in patients with sinonasal cancer: A historical analysis of population-based data. Head Neck. 2012;34:877-885.
13. Jones AV, Robinson I, Speight PM. Sinonasal undifferentiated carcinoma: Report of a case and review of literature. Oral Oncol. Extra. 2005;41:299-302.
14. Garg D, Mathur K. Clinico-pathological Study of Space Occupying Lesions of Nasal Cavity, Paranasal Sinuses and Nasopharynx. J Clin Diagn Res. 2014;8(11):FC04-FC7. Doi: 10.7860/JCDR/2014/10662.5150.
15. Khan N, Zafar U, Afroz N, Ahmad SS, Hasan SA. Masses of nasal cavity, paranasal sinuses and nasopharynx: A clinicopathological study. Indian J Otolaryngol Head Neck Surg. 2006;58(3):259-263.
16. Dasgupta A, Ghosh RN, Mukherje C. Nasal polyps-Histopathologic spectrum. Indian J Otolaryngol and Head and Neck Surg. 1997;49:32-36.
17. Bakari A, Afolabi QA, Adoga AA, *et al*. Clinicopathological profile of sinonasal masses: An experience in National Ear Care Center Kaduna, Nigeria. BMC Res Notes. 2010;3:186.
18. Lathi A, Syed MMA, Kalakoti P, Qutub D, Kishve SP. Clinicopathological profile of sinonasal masses: a study from a tertiary care hospital of India, Acta Otorhinolaryngol Ital. 2011 Dec;31(6):372-377.
19. Kulkarni AM, Mudholkar VG, Acharya AS, Ramteke RV. Histopathological study of lesions of nose and paranasal sinuses. Indian J Otolaryngol Head Neck Surg. 2012;64:275-9.
20. Neb V, Bhagat V, Patel PR, Rupareliya N, Gandhi N. Spectrum of neoplastic sino-nasal lesions at tertiary care centre. Indian J Pathol Oncol. 2020;7(1):104-108.
21. Parajuli S, Tuladhar A. Histomorphological spectrum of masses of the nasal cavity, paranasal sinuses and nasopharynx. Journal of Pathology of Nepal. 2013;3(5):351-55.
22. Garg D, Mathur K. Clinico-pathological Study of Space Occupying Lesions of Nasal Cavity, Paranasal Sinuses and Nasopharynx. J Clin Diagn Res. 2014;8(11):FC04-FC7. Doi: 10.7860/JCDR/2014/10662.5150.
23. Parmar NJ, Jethwani DP, Dhruva GA. Histopathological study of nasal lesions: 2 years study. Int J Res Med Sci. 2018;6:1217-23.
24. Bhattacharyya R, Chakrabarti I, Giri I, Banerjee A, Bhattacharya J, Goswami B. A clinicopathological study of masses arising from sinonasal tract and nasopharynx in north Bengal

ISSN:0975 -3583,0976-2833 VOL14, ISSUE 05, 2023

population with special reference to neoplasms. Egypt J Otolaryngol. 2015;31(2):98.
25. Vartak UC, Sarnaik AG, Vartak S, Pathan F. Spectrum of histopathological lesions of nose and paranasal sinuses: A 5-year study. J Med Soc. 2020;34:128-38.
26. Charu Chandra, Pragat Gupta. A histopathological study of lesions of nasal cavity and para nasal sinuses. International Journal of Medical and Health Research. 2017;3(7):09-11.