Presentation of Lesions of Nose and Paranasal Sinuses at a Tertiary Care Center in Central India

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Abstract A variety of non-neoplastic and neoplastic conditions involve the nasal cavity, paranasal sinus and are fairly common presentation encountered in clinical practice. Sinonasal lesions are a common finding in all age groups. The lesion of nose and paranasal sinuses are very deceptive so, the presenting features, clinical examination, nasal endoscopy, radiodiagnosis and histopathology are employed conjointly to reach a diagnosis. This cross sectional study was conducted between November 2014 and September 2016. 150 patients with nasal or paranasal sinus lesions attending ENT OPD were included. Among 150 patients there was a male predominance in all lesion except malignant lesions and most of the patients 72 (48%) were in the age group 11–30 years. Mean age of presentation for benign lesions was 33.64 years and of malignant lesions was 49.14 years. The study showed that 96 (64%) of the nose and PNS lesions were of inflammatory nature followed by 22 (15%) benign, 18 (12%) granulomatous and 14 (9%) malignant, Inflammatory polyp being the most common diagnosis. Haemangioma was the most common benign neoplastic lesion whereas in granulomatous lesions most common diagnosis was tuberculosis. The maximum lesions 74 (49%) were in maxillary antrum. The most common clinical presentation was nasal obstruction, with unilateral nasal obstruction seen in 84 (56%) cases and bilateral nasal obstruction in 50 (33.3%) cases. Angiofibroma 6 (4%) was exclusively seen in adolescent males.

Olfactory neuroblastoma 4 (2.6%) was diagnosed in females with mean age of presentation of 30 years. Sinonasal lesions display a complex and interesting spectrum of clinical, radiological and histopathologic features. The non-neoplastic lesions are numerous, the morphologic variants of neoplasms are many and most of them present as polypoid masses which are impossible to distinguish clinically. Hence a proper workup including histopathological and radiological categorization is essential in the management of these lesions.

Keywords Nose · Paranasal sinuses · Tumor · Polyp · Granulomatous lesions

Introduction

A variety of non-neoplastic and neoplastic conditions involve the nasal cavity (NC), paranasal sinuses (PNS), and are fairly common lesions encountered in clinical practice. A large number of diseases affecting these structures are due to variety of the specialized tissues, each with its own aberrations that exist in the region. Sinonasal area is exposed to various infective agents, chemicals, antigens, mechanical and many other influences. These deleterious exposures lead to formation of tumor like and tumor like conditions which can range from simple hypertrophied inferior turbinate, nasal polyps, granulomatous lesions to malignant lesions and can present in all age group [1]. Malignant tumors accounts for 0.2–0.8% of all human malignancy and only 3% of all malignant tumors of upper aero digestive tract [2]. Benign lesions of sinonasal region are common and lack of appreciation of these lesions can lead to radical surgeries. They have long clinical history with frequent local recurrence and thus relatively

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significant morbidity. Inflammatory polyps are a common cause of benign lesion, with a prevalence of 4% in the general population [3].

Granulomas of the nose are chronic inflammatory lesions characterised by formation of granulomatous tissue by circumscribed infiltrations of chronic inflammatory cells, usually histiocytic in nature. They may be bacterial in origin, like rhinoscleroma, syphilis, tuberculosis or leprosy or may be of fungal origin, like aspergillosis or candidiasis.

Sinonasal lesions are a common finding in all age groups. Common presenting symptoms of sinonasal lesions are nasal blockade, nasal discharge, epistaxis, facial swelling, orbital and ear symptoms.

The lesions of nose and paranasal sinuses are very deceptive so, the presenting features, clinical examination, nasal endoscopy, radio diagnosis and histopathology are employed conjointly to reach a diagnosis. The aim of this clinicopathological study was to find out the incidence of non-neoplastic and neoplastic polypoidal lesions of nasal cavity and paranasal sinuses in Indian population.

Materials and Methods

The present study was carried out at a tertiary care center of central india which involved patients with lesions in nose and paranasal sinuses including both tumor, tumor like lesions and various granulomatous lesions and conducted over a period of 2 years. 150 patients with nasal or paranasal sinus lesions attending ENT OPD were included and detailed history and consent was taken as per self made preforma, complete ENT examination was done. Each patient was subjected to nasal endoscopic examination using 0° Hopkins rod to note site, size, and edges of the lesion. Biopsy sample was sent for Histopathological examination and Radiological examination was done using CT scan and X-ray whenever required. The lesions found during the study were classified into see Table 1.

Result

Histological examination revealed that 96 (64%) of the nose and PNS lesions were of inflammatory nature, 36 (24%) neoplastic and 18 (12%) granulomatous. The ratio of inflammatory to neoplastic lesion was 2.67:1, Whereas ratio of benign to malignant lesion was 1.57:1.

In the study there was male predominance in all lesions except malignant where it was 0.75:1 (Table 2). The mean age of presentation was 34.6 years youngest aged 10 and oldest 74 years. Thus, indicating that the majority of the patients were middle aged adults (Table 3). Most of the patients were from urban area 88 (58.7%), Inflammatory conditions were more common in patients 66 (44%) coming from these area, whereas granulomatous 14 (9.3%) and malignant 10 (6.6%) lesions were predominant in rural areas.

Maximum lesions 74 (49%) were in maxillary antrum, out of which 66 (44%) were inflammatory lesions and 8 (5%) were malignant. The benign lesion 10 (7%) arise from lateral wall of nose, while the granulomatous lesion 14 (10%) where present in the septum (Table 4). Most common clinical presentation was nasal obstruction, with unilateral nasal obstruction seen in 84 (56%) cases and bilateral nasal obstruction in 50 (33.3%) cases followed by nasal discharge was seen in 102 (68%) cases (Table 5).

Clinically most common lesion diagnosed was antrochoana polyp 38 (25.3%), whereas haemangioma 12 (8%) and maxillary carcinoma 16 (10.6%) where most common diagnosed benign and malignant lesion. While clinically Tuberculosis was most common granulomatous lesion seen in 6 (4%) cases (Table 6).

Histopathologically majority of patients 64 (42.7%) were diagnosed with inflammatory polyp. Haemangioma being the most common benign lesion seen in 12 (8%) cases. Whereas squamous cell carcinoma being the most common malignant lesion diagnosed on histopathology in 10 (6.6%) cases. Leprosy and rhinosporidiosis 4 (2.7%) cases of each were diagnosed on histopathology, while other cases of granulomatous lesion were confirmed as

Table 1 Classification of lesions

Neoplastic		Infection inflammatory		Granulomatous
Benign	Malignant			
Osteoma	Squamous Cell carcinoma	Polyps	Ethmoidal Antrochoanal	Rhinosporidiosis
Inverted papilloma	Adeno carcinoma	Mucocele		Rhinoscleroma
Angiofibroma	Adenocystic carcinoma	Fungal sinusitis		Syphilis
Haemangioma etc.	Esthesioneurablastoma			Tuberculosis

Table 2 Gender distribution for different lesions

Sex	Inflammatory lesions	Benign	Malignant	Granulomatous
Male	50 (33.3%)	12 (8%)	6 (4%)	12 (8%)
Female	46 (30.7%)	10 (6.7%)	8 (5.3%)	6 (4%)
Total	96 (64%)	22 (14.7%)	14 (9.3%)	18 (12%)
Male:female ratio	1.08:1	1.2:1	0.75:1	2:1

Table 3 Age wise distribution of different lesions

Age distribution	Inflammatory	Benign	Malignant	Granulomatous
11–20	24 (16%)	6 (4%)	0	6 (4%)
21–30	20 (13.3%)	8 (5.3%)	4 (2.7%)	4 (2.7%)
31–40	26 (17.3%)	0	2 (1.3%)	2 (1.3%)
41–50	18 (12%)	4 (2.7%)	2 (1.3%)	4 (2.7%)
51–60	8 (5.3%)	2 (1.3%)	0	2 (1.3%)
61–70	0	2 (1.3%)	4 (2.7%)	0
71–80	0	0	2 (1.3%)	0

Table 4 Site of different lesion

Type of lesion	Site of lesion						
	Maxillary antrum	Ethmoidal sinus	Lateral wall	Septum	Roof	Floor	Nasopharynx
Inflammatory	66	28	0	0	0	0	2
Benign	0	0	10	6	0	0	6
Malignant	8	0	0	0	4	0	2
Granulomatous	0	0	0	14	0	2	2
Total	74 (49%)	28 (19%)	10 (7%)	20 (13%)	4 (3%)	2 (1%)	12 (8%)

Table 5 Signs and symptoms of different lesions

Signs and symptoms	Inflammatory (96)	Benign (22)	Malignant (14)	Granulomatous(18)
U/I nasal obstruction	50 (52.1%)	18 (81.8%)	12(85.7%)	4 (22.2%)
B/I nasal obstruction	46 (47.9%)	0	2 (14.3%)	2 (11.1%)
Nasal discharge	76 (50.7%)	8 (36.4%)	14 (100%)	4 (22.2%)
Sneezing	66 (79.2%)	0	0	0
Epistaxis	8 (8.3%)	22 (100%)	10 (71.4%)	12 (66.7%)
Headache	64 (66.7%)	6 (27.3%)	0	0
Hyposmia	50 (52.1%)	6 (27.3%)	6 (42.9%)	8 (44.4%)
Hyponasality	20 (20.8%)	6 (27.3%)	2 (14.3%)	0
Sinus tenderness	72 (75%)	6 (27.3%)	8 (57.1%)	0
Lesion sensitive to touch	2 (2.1%)	22 (100%)	12 (85.7%)	10 (55.5%)

Table 6 Showing clinico-radiological and histopathological correlation among cases

Clinical diagnosis	Radiological diagnosis	Histopathological diagnosis
Antrochoanal polyp 38	Antrochoanal polyp 24 sinusitis with polyp 8 antral polyp 4 nasal mass 2	Antrochoanal polyp 22 inflammatory polyp 16
Ethmoidal polyp 28	Sinusitis with polyp 16 ethmoidal poly 6 nasal mass 6	Inflammatory polyp 28
Sinusitis 28	Antral polyp 18 fungal sinusitis 8 antrochoanal polyp 2	Inflammatory polyp 20 mucormycosis 8
Haemangioma 12	Nasal mass 6 haemangioma 4 papilloma 2	Capillary haemangioma 8 cavernous haemangioma 4
Angiofibroma 8	Angiofibroma 6 antrochoanal polyp 2	Angiofibroma 6 antrochoanal polyp 2
Maxillary carcinoma 16	Ca maxilla 8 papilloma 6 olfactory neuroblastoma 2	Sq cell carcinoma 8 olfactory neuroblastoma 4 papilloma 4
Nasopharyngeal carcinoma 4	Carcinoma nasopharynx 4	Sq cell carcinoma 2 granulomatous disease 2
Tuberculosis 6	–	Granulomatous disease 6
Oroantral fistula 2	–	Granulomatous disease 2
Leprosy 4	–	Leprosy 4
Rhinosporidiosis 4	Nasal mass 4	Rhinosporidiosis 4

tuberculosis 8 (5.3%) and one as syphilis 2 (1.3%) on further evaluation (Fig. 1).

Discussion

In present study inflammatory and tumor like lesion were mainly seen in age group of 31–40 years with a mean age of presentation of 33.21 years. The benign lesions were common in age group of 21–30 years with mean age of presentation of 33.64 years. The mean age of presentation of malignant lesions was 49.14 years. The youngest patient was a female of 24 years diagnosed as a case of Olfactory Neuroblastoma. Das Gupta et al. [4] reported maximum number of cases of inflammatory and tumor like lesions in the age group of 21–40 years which was in corroboration to our study. We had 22 cases of benign sinonasal masses, 8 case were from the age group of 21–30 years, Benign lesions were rare finding in the age group > 50 years, our finding were that similar to Khan et al. [5].

In present study the male to female sex ratio for sino-nasal lesions was found to be 1.3:1 and for inflammatory lesions was 1.08:1. Dandapath et al. [6] reported the sex ratio of 1:1 for inflammatory and tumor like lesions. Whereas for malignant sinonasal lesions we found a sex ratio of 0.75:1 comparable to Khan et al. [5].

We found unequal distribution of cases in urban and rural areas. Inflammatory lesions were more common in urban areas rising up to a total of 66 cases (44%) in comparison to 30 cases (20%) in rural areas, this may be attributed to more dust and allergen exposure in urban areas and less awareness for medical help in rural areas. Inflammatory lesions were more common in miners, farmer, labourers and marble workers having higher exposure to dust and air pollutants.

Headache was a predominant presenting symptom in many cases as most number of lesions arised from maxillary antrum (49%) and ethmoidal sinus (19%) resulting in blockage of sinuses resulting in headache. The most common presentation of sino nasal lesions in our study was nasal obstruction (89.3%), predominantly unilateral followed by nasal discharge (68%), headache (46.7%), hyposmia (46.7%), sneezing (44%), epistaxis (34%) and lastly hyponasality (18.7%). These results were in accordance with studies done by Aniket et al. [7] and lathi et al. [3] which showed similar results. In our study we found significantly more number of cases with complaints of epistaxis which may be due to the more number of granulomatous lesions.

On histopathological examination total of 96 (64%) cases diagnosed as inflammatory lesions out of which polyps were 88 (58.7%) in which 64 (42.7%) were

Fig. 1 Distribution according to histopathological diagnosis

inflammatory and 24 (16%) antrochoanal polyp. The above cases on clinical examination were diagnosed as antrochoanal polyp, ethmoidal polyp and sinusitis respectively.

Out of 64 cases of inflammatory polyp 34 were male and 30 females with age range of 15–56 years and mean age of presentation 35.6 years. Most of the patients came from urban areas 50 (78.5%) which may be due to the fact that they have better awareness and present early in the OPD. The male to female ratio was 1.3:1. Our findings are comparable to the study conducted by Anjali Das Gupta et al. [8] in which nasal polyps constituted commonest type of non neoplastic lesions with age range of 8–76 years and mean age of 32.6 years and sex ratio 1.3:1.

Invasive fungal rhinosinusitis which on histopathology was diagnosed as mucormycosis 8 cases were found during the study. Male to female ratio was 1:1, with age range of 16–60 years and mean age of 44 years. Nasal obstruction was seen in 6 (75%), nasal discharge 6 (75%), epistaxis 4 (50%), sinus tenderness 8 (100%), loss of visual acuity and ophthalmoplegia in 6 cases. Clinically the 6 adults were in immunocompromised state 4 with long history of diabetes mellitus and other with AIDS. Retrospective review by Ahmet et al. [9] revealed 19 patients with fungal sinusitis, of the patients 11 were male and 8 females with age range 5–74 years and mean age of 37.1 years. All patients had an underlying immunocompromised state. Nasal obstruction was predominant symptom (94.7%), followed by facial pain (68.4%), headache (42.1%) and facial swelling (26.3%).

In the present study 6 adult male with age range 19–25 years and mean age 21.7 years were diagnosed as JNA both on Contrast CT and histopathology. We had 4 cases of inverted papilloma all were male in 4th to 6th decade of life presenting with epistaxis. Four (2.6%) cases of olfactory neuroblastoma all females with mean age of presentation 30 years.

A total of 18 (12%) cases were diagnosed as granulomatous lesions with rural to urban ratio of 3.5:1, which was similar to results by Mohanty et al. [10] In same study by Mohanty [10] on 150 cases of granuloma nose, rhinosporidiosis (91.33%) was found to be the commonest followed by rhinoscleroma (6%), tuberculosis (1.33%), leprosy and foreign body granuloma (0.67%). In contrast our study had 4% cases of tuberculosis, This high incidence may be due to our hospital being a tertiary RNTCP Centre.

In the present study we had 4 cases (2.6%) of rhinosporidiosis, male to female ratio being 1:1, with ages between 2nd and 4th decade. The cases shared equal rural and urban distribution, presenting with unilateral nasal mass attached to septum which was sensitive to touch. Our findings were in accordance to the study done by Dinesh Garg et al. [1].

In our study two female, belonging to rural area, aged 40 years presenting with bilateral nasal obstruction, intermittent epistaxis and bilateral cervical lymphadenopathy showed a polypoidal mass arising from nasopharynx on diagnostic endoscopy. CT Scan findings of the patient suggested a nasopharyngeal mass arising from lateral wall with a probable diagnosis of Ca nasopharynx. Histopathological reports from biopsy of the mass was suggestive of granulomatous lesion while FNAC of cervical lymphnode showed features of Rosai Dorfman Disease (RDD). In a study by Yu et al. [11] among 16 cases of RDD 62.5% presented with nodal RDD, with cervical node predominantly involved and extranodal RDD represented 37.5% of cases.

Most common location for benign lesions was nasal cavity (72.72%) followed by nasopharynx (27.27%) while for the malignant lesions was in paranasal sinuses (57.14%) followed by nasal cavity (28.6%) and nasopharynx (14.3%).

Conclusion

Sinonasal lesions display a complex and interesting spectrum of clinical, radiological and histopathologic features. The non-neoplastic lesions are numerous, the morphologic variants of neoplasms are many and most of them present as polypoid masses which are impossible to distinguish clinically. Hence a proper workup including histopathological and radiological categorization is essential in the management of these lesions. The study concluded benign lesions were more common in young adults while neoplastic in middle aged adults. Granulomatous lesions (9.3%) and malignant lesions (6.6%) were predominant in rural areas. Haemangioma being most common benign neoplastic lesion had a gender predominance in females with a mean age of presentation 32 years. Angiofibroma and inverted papilloma were exclusively seen in males. On the other hand olfactory neuroblastoma was seen in females. Rosai Dorfman disease can have both nodal and extranodal presentation. Epistaxis was predominant presenting symptom of benign lesion (100%) and granulomatous lesion (66.7%).

Compliance with Ethical Standards

Conflict of interest Siddharth Gautam singh, Sadat Qureshi, Leena Jain Shalini Jadia, Sandeep Sharma declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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