Section: Pathology

Original Research Article

HISTOPATHOLOGICAL STUDY OF LESSIONS IN UPPER AERODIGESTIVE TRACT- AN OBSERVATIONAL PROSPECTIVE STUDY

SK. Aamer Saleem[1], Anusha Potnuru[1], B. Roshni Sumalini[1]

[1]*Associate Professor, Department of Pathology, Kamineni Academy of Medical Sciences & Research Centre, LB Nagar, Hyderabad, Telangana, India.*

Received *: 03/03/2025*
Received in revised form *: 29/04/2025*
Accepted *: 17/05/2025*

Corresponding Author:
Dr. SK. Aamer Saleem,
Associate professor, Department of Pathology, Kamineni academy of medical sciences & research Centre, LB Nagar, Hyderabad, Telangana, India.
Email: Saleem17121990@gmail.com

DOI: 10.70034/ijmedph.2025.2.329

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (2); 1842-1851

ABSTRACT

Background: Oral lesions are a common entity because of mucosal exposure to tobacco, recurrent trauma, infections (especially viral infections), and genetic predisposition. Many epidemiological studies have concluded that excess intake of alcohol and tobacco leads to increased risk of oral cavity cancers. The oral cavity represents the entrance to the upper aerodigestive tract, which begins at the lips and ends at the anterior surface of the faucial arch. It is lined by squamous epithelium with interspersed minor salivary glands. The aim is to study the spectrum of lesions in the upperaerodigestive tract.

Materials and Methods: This is a prospective study of various types of lesions in the upper aerodigestive tract. The specimens included hemimandibulectomies, total laryngectomies, polypectomies, glossectomies and tissue biopsies obtained from the departments of Otorhinolaryngology and Surgical Oncology at NRI Medical College & General Hospital, Chinakakani from June 2015 to May 2017.

Results: In the present study, There were 200 cases of upper aerodigestive tract, both non neoplastic and neoplastic lesion during the study period of two years. Neoplastic lesions were the majority in number 134 (67%) with benign being 21 (16%) and malignant are 113 (84%). Non-neoplastic lesions were 66 (33%) in number with most common age group effected being 31-40 years and commonest lesions was chronic nonspecific inflammation constituting to 19 cases (28.7%). Of the benign lesions, the most common age group effected were 41-50 years with male preponderance and majority being squamous papilloma. Among malignant neoplasms, the common age group affected was 51-60 years and commonest lesion was Squamous cell carcinoma. As most non-neoplastic and neoplastic lesions of the upper aerodigestive tract have similar clinical manifestations and radiological appearances, only provisional diagnosis can be made in these cases. Many of these lesions are inaccessible to FNAC and some are not recommended for fear of hemorrhage.

Conclusion: Present study concluded that, the correct and final diagnosis can be made only by histopathological examination. Therefore, histopathological diagnosis is mandatory for proper early treatment and to assess the prognosis of these patients. Studies are essential for education and awareness aimed at reducing exposure to habit-forming substances.

Keywords: Upper aerodigestive tract, Histopathology, Neoplastic lesions, FNAC, Squamous cell carcinoma.

INTRODUCTION

The upper aerodigestive tract consists of various structures and are sites for a wide variety of neoplastic and non-neoplastic conditions. The structures included are oral cavity, oropharynx, nasopharynx, hypopharynx, nasal cavity, paranasal sinuses, larynx, middle ear, auditory tube and mastoids. These sites were defined using the criteria adopted by the American Joint Committee on Cancer

(AJCC) and the International Union Against Cancer (IUCC) as outlined in the TNM staging manual.[1]

The lesions present with unique sets of epidemiological, pathological and treatment considerations which exhibit considerable variation in geographical distributions.[2-5] The non-neoplastic lesions are often more common than the neoplastic lesions with male preponderance. The cancers of upper aerodigestive tract constitute about 3.5 to 4% of all malignancies.[3,4]

Although relatively rare when compared individually with malignant tumors in the other parts of the body, together they constitute the sixth most common group of malignant neoplasms and eighth leading cause of cancer related death worldwide.[5,6] The lesions especially the neoplastic ones of upper aerodigestive tract are of great challenge to the modern science and to the patient as it often calls for a major surgery which often leads to disfiguration also.

As previously noted, studies on lesions of upper aerodigestive tract are scanty and everyday new morphological patterns of diseases are being identified and differentiated from the other known previous lesions with the help of various diagnostic methods like immunohistochemistry etc.

Hence, this study therefore aims to consolidate on what is already established and study in greater detail the pathological features of various lesions of upper aerodigestive tract, especially in a resource-poor country like India.

Aims and Objectives

1. To study the spectrum of lesions in the upper aerodigestive tract.
2. To categorize the various lesions into non-neoplastic and neoplastic lesions based on histopathological findings.
3. To study the incidence of lesions with respect to age, sex and site of lesions.
4. To compare the present data with other similar studies.

MATERIALS AND METHODS

This is a prospective study of various types of lesions in the upper aerodigestive tract. The specimensincluded hemimandibulectomies, total laryngectomies, polypectomies, glossectomies and tissue biopsies obtained from the departments of Otorhinolaryngology and Surgical Oncology at NRI Medical College & General Hospital, Chinakakani from June 2015 to May 2017.

All the specimens and tissue biopsies received are fixed in 10% formalin and routinely processed. 3-5 microns thick sections made from paraffin embedded blocks and stained with haematoxylin and eosin. Special stains and IHC are done whenever required. Detailed study of the histopathological sections is done and the results are tabulated.

Inclusion Criteria

All the specimens from the upper aerodigestive tract.

Exclusion criteria:

Biopsy material other than the lesions of upper aerodigestive tract.

Ethical clearance

Ethical clearance has been obtained from Ethical committee of NRI Medical College, Chinakakani.

Statistical methods applied:

- Number and percentage.
- Descriptive statistics.

RESULTS

The present study included all the upper aerodigestive tract lesions that were reported in the Department of Pathology, NRI Medical College, Chinakakani over a period of 2 years from June 2015 to May 2017. The study included 200 cases, of which 66 cases were non-neoplastic and 134 cases were neoplastic lesions. The neoplastic lesions were more common than non-neoplastic lesions. The ratio of neoplastic to non-neoplastic lesions is 2.03:1.

Table 1: Incidence of neoplastic and non-neoplastic lesions.

Type of Lesion	Number of Cases (%)
Neoplastic	134 (67)
Non-neoplastic	66 (33)
Total	200 (100)

Age distribution in non-neoplastic lesions: The age distribution among the non-neoplastic lesions ranged from 7 years to 80 years. Majority of cases were seen in the age group of 31-40 years constituting to25.7 % of all non-neoplastic conditions.

Table 2: Age distribution of non-neoplastic conditions

Age Group	Number (% of cases)
0-10	3 (4.5%)
11-20	6 (9.0%)
21-30	10 (15.1%)
31-40	17 (25.7%)
41-50	14 (21.2%)
51-60	8 (12.1%)
61-70	5 (7.5%)
71-80	3 (4.5%)
Total no. of cases	66 (100%)

Sex distribution among the non-neoplastic lesions: Among 66 cases of non-neoplastic lesions, 33 cases each in males and females are seen. The ratio is 1:1.

Table 3: Sex distribution among the non-neoplastic lesions

Sex	Number(% of cases)
Male	33(50%)
Female	33(50%)
Total no. of cases	66(100%)

Site wise distribution of non-neoplastic lesions: Out of 66 cases of non-neoplastic lesions in the present study, the most common sites were middle ear and larynx with 18 cases each constituting to 27.2% each.

Table 4: Site wise distribution of non-neoplastic lesions

Site	Number (% of cases)
Oral cavity	8 (12.1%)
Tongue	3 (4.5%)
Nasal cavity	13 (19.6%)
Paranasal sinuses	6 (9.09%)
Pharynx	–
Middle ear	18 (27.2%)
Larynx	18 (27.2%)
Total	66 (100%)

Histological types of non-neoplastic lesions: Out of 66 cases of non-neoplastic lesions, the common lesion was chronic non-specific inflammation of 19 cases (28.7%), followed by 17 cases (25.7%) of vocal cord polyps.

Table 5: Histological types of non-neoplastic lesions

Types	Number (% of cases)
Chronic non-specific inflammation	19 (28.7%)
Vocal cord polyps	17 (25.7%)
Nasal polyps	13 (19.6%)
Cholesteastoma	6 (9.0%)
Otic polyps	5 (7.5%)
Mucormycosis	4 (6.0%)
Mucous retention cyst	2 (3.0%)
Total	66 (100%)

Age distribution among various non-neoplastic lesions: Chronic non-specific inflammation were the commonest of all non- neoplastic lesions and most of them were observed in the age group of 31-40 years.

Table 6: Age distribution among various non-neoplastic lesions

Type of lesion	0-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	Total
Chronic non- specific inflammation	2	–	1	7	2	2	3	2	19
Vocal cord polyps	–	–	2	3	7	3	2	–	17
Nasal polyps	1	3	3	4	1	1	–	–	13
Cholesteatoma	–	1	1	-	2	1	–	1	06
Otic polyps	–	–	2	2		1	–	–	05
Mucormycosis	–	–	1	1	2	–	–	–	04
Mucous retention cyst	–	2	–	–	–	–	–	–	02
Total	03	06	10	17	14	8	5	3	66

Neoplastic Lesions: Out of 134 neoplastic lesions 21 cases were benign neoplasms and 113 cases were malignant neoplasms.

Table 7: Incidence of Neoplastic Lesions

Type	Number (% of cases)
Benign neoplasms	21 (16%)
Malignant neoplasms	113 (84%)
Total	134 (100%)

Age distribution among the benign neoplasms: The age distribution among the benign neoplasms ranged from 8 to 75 years. Majority of cases were seen in the age group of 41-50 years constituting to 5 cases (23.8%) of all the benign neoplasms.

Table 8: Age distribution among the benign neoplasms

Age group (Years)	Number (% of cases)
0-10	1 (4.76%)
11-20	–
21-30	2 (9.52%)
31-40	1 (4.76%)
41-50	5 (23.8%)
51-60	4 (19.05%)
61-70	4 (19.05%)
71-80	4 (19.05%)
Total	66 (100%)

Sex wise distribution among the benign neoplasms: Out of 21 cases of benign neoplasms, 12 (57%) cases were in males and 9 (43%) cases were in females. There was male preponderance in the benign lesions with male to female ratio of 1.3:1.

Table 9: Sex wise distribution among the benign lesions

Sex	Number (% of cases)
Male	12 (57%)
Female	9 (43%)
Total	21 (100%)

Site wise distribution of benign neoplasms: Out of 21 cases of benign neoplasms, the most common site of involvement was oral cavity constituting to about 6 cases (28.57%).

Table 10: Site wise distribution of benign neoplasms

Site	Number (% of cases)
Oral cavity	6 (28.57%)
Larynx	5 (23.80%)
Nasal cavity	5 (23.80%)
Tongue	3 (14.28%)
Pharynx	1 (4.7%)
Paranasal sinuses	1 (4.7%)
Middle ear	–
Total	21 (100%)

Histological types of benign neoplasms: Among 21 cases of benign neoplasms, the most common lesion was squamous papilloma accounting for 8 cases (38.09%).

Table 11: Histological types of benign neoplasms

Types	Number (% of cases)
Squamous papilloma	8 (38.09%)
Sinonasal papilloma	4 (19.04%)
Fibroepithelial polyp	2 (9.52%)
Ameloblastoma	2 (9.52%)
Hemangioma	2 (9.52%)
Hamartoma	1 (4.7%)
Nasopharyngeal angiofibroma	1 (4.7%)
Angiofibroma of larynx	1 (4.7%)
Total	21 (100%)

Age distribution among various benign neoplasms: The most common age group involved was 41-50 years of age with 5 cases out of total 21 benign lesions.

Table 12: Age distribution among various benign neoplasms

Type	0-10 yrs	11-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	71-80 yrs	Total
Squamous papilloma	1	–	1	1	3	–	–	2	08
Sinonasal papilloma	–	–	–	–	1	1	2	–	04
Fibroepithelial polyp	–	–	–	–	–	1	1	–	02
Ameloblastoma	–	–	–	–	1	–	–	1	02
Hemangioma	–	–	–	–	–	–	1	1	02
Hamartoma	–	–	1	–	–	–	–	–	01
Nasopharyngeal angiofibroma	–	–	–	–	–	1	–	–	01
Angiofibroma of larynx	–	–	–	–	–	1	–	–	01
Total	01	00	02	01	05	04	04	04	21

Age distribution among the malignant neoplasms: In the present study, the age distribution among the malignant neoplasms ranged from 14 to 86 years. Majority of cases were seen in the age group of 51-60 years constituting to 29% of all malignant neoplasms.

Table 13: Age distribution among the malignant neoplasms

Age in Years	Number of Cases (%)
0-10	–
11-20	1 (0.88%)
21-30	3 (2.65%)
31-40	11 (9.73%)
41-50	25 (22.12%)
51-60	29 (25.66%)
61-70	25 (22.12%)
71-80	14 (12.38%)
81-90	5 (4.42%)
Total	113(100%)

Sex wise distribution among the malignant neoplasm: Among 113 cases of malignant neoplasms, 78 cases were seen in males and 35 cases were seen in females. There was a male preponderance with male to female ratio of 2.2:1.

Table 14: Sex wise distribution among the malignant neoplasm

Sex	Number (% of cases)
Male	78 (69.03%)
Female	35 (30.97%)
Total	113 (100%)

Site wise distribution among malignant neoplasms: Out of all 113 cases, the most common site was oral cavity with 34 cases accounting for 30.08%.

Table 15: Site wise distribution among malignant neoplasms

Site	Number (% of cases)
Oral cavity	34 (30.08%)
Pharynx	28 (24.77%)
Larynx	27 (23.80%)
Tongue	18 (15.92%)
Nasal cavity	5 (4.42%)
Paranasal sinuses	1(0.88%)
Middle ear	–
Total	113 (100%)

Histopathological subtypes of malignant neoplasms: Among 113 cases of malignant neoplasms, there were 104 cases of Squamous cell carcinoma (92.03%), 4 cases of Nasopharyngeal carcinoma (3.53%), 2 cases of Non-Hodgkin's Lymphoma (1.76%), 2 cases of Adenocarcinoma and a single case of Sinonasal Undifferentiated Carcinoma (0.88%).

Table 16: Histopathological subtypes of malignant neoplasms

Types	Number (% of cases)
Squamous cell carcinoma	104 (92.03%)
Nasopharyngeal carcinoma	4 (3.53%)
Non-Hodgkin's Lymphoma	2 (1.76%)
Adenocarcinoma	2 (1.76%)
Sinonasal Undifferentiated Carcinoma	1(0.88%)
Total	113 (100%)

Age distribution among various malignant neoplasms: Among, 103 cases SCC cases, most common age group was 51-60 years with 26 cases.

Table 17: Age distribution among various malignant neoplasms

Type of Malignant Neoplasm	Age in Years									TOTAL
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	
Squamous cell carcinoma	–	–	3	11	21	26	24	14	5	104
Non-Hodgkin's Lymphoma	–	–	–	–	–	1	–	1	–	02
Nasopharyngeal carcinoma	–	1	–	–	1	1	1	–	–	04

Adenocarcinoma	–	–	–	–	1	1	–	–	–	02
Sinonasal Undifferentiated Carcinoma	–	–	–	–	1	–	–	–	–	01
Total	0	1	3	11	24	29	25	15	5	113

DISCUSSION

The lesions of upper aerodigestive tract are relatively common forms of malignancy in the socioeconomic situation with high risk factors, such as tobacco, alcohol abuse, poor oral hygiene and nutritional deficiency. The head and neck is the location with most diverse pathological manifestations, as it is anatomically composed not only of squamous or columnar epithelium, of either ectodermal or endodermal origin, but also of various types of mesenchymal and neural tissues.[3] Hence, histopathological examination is a must for final definitive diagnosis along with the use of other methods like special stains and immunohistochemistry.

In the present study which consists of 200 cases of various diverse lesions of upper aerodigestive tract were analyzed over a period of years at NRI Medical College & General Hospital from June 2015 to May 2017.

The analysis of the results obtained in the present study showed that out of 200 cases, 66 were of non-neoplastic cases and 134 cases were of neoplastic ones. There was predominance of neoplastic lesions, with the ratio of non- neoplastic to neoplastic of 1:2.03. In this study among the total 66 non-neoplastic lesions of oral cavity including tongue constitutes to 11 cases. According to the study conducted by Modi et al,[7] the total number of non-neoplastic cases in oral cavity was 45 and in study done by Kosam et. Al,[8] it was 79 cases.

The most common age group affected by the non-neoplastic lesions in the present study was 31-40 years. In contrast to our study, the most common age group affected in the study done by Modi et al,[7] was 21-30 years. The youngest age affected was 12 years female in the present study but in their study it was of 3 years old only.

Chronic inflammatory lesions were the most common non-neoplastic lesion in the present study, similar to the study done by Modi et al,[7] But, in contrast to both these studies keratosis was the most common non-neoplastic lesion in the study conducted by Kosam et. al.[8] The chronic inflammatory lesions in the present study were 9 (13.6%) cases, 12 (26.6%) cases in the study of Modi et Al,[7] and 7 (8.8%) cases in the study of Kosam et al.[8]

Chronic inflammatory lesions are relatively common oral cavity lesions which occur due to ill-fitting dentures or prosthesis poor oral hygiene etc. They are characterized microscopically by epithelial hyperplasia with absence of dysplastic features. Edematous change, mixed inflammatory cell reaction and secondary reactive / degenerative changes like fibrosis, atrophy etc can occur.In a study done by Bhaskar et al,[9] 341 cases of chronic inflammatory lesions have been reported, all associated with the use of dentures, under the term inflammatory papillary hyperplasia; 82.7% of the lesions were located in the palate. Localized overgrowth of the epithelium with or without ulceration is frequent, and it is not rare to see large pseudotumors made up of fibrous tissue and chronic inflammatory cells, among which plasma cells may be prominent.[10]

The non-neoplastic lesions of the nose and paranasal sinuses together constitute about 19 cases. According to study conducted by Janice Jason et. Al,[11] 77 cases were non-neoplastic. The most common age group affected by the above lesions was 31-40 years followed by 21-30 years and in contrast to our study; most common effected age group was 21-30 years in the study conducted by Jyothi A Raj et. al.[12]

The present study showed female preponderance among non-neoplastic lesions of nose and paranasal sinuses with 10 female and 9 male cases. According to study done by A Lathi et. al,[13] there was male preponderance, 46 cases were seen in males and 36 in females but in the study done by Parajuli et al,[14] it showed female preponderance.

Polyps were the most common non-neoplastic lesions in the present study the most common being the inflammatory polyp constituting to about 11 cases followed by allergic polyp of 2 cases. They both constituted to about of 68.42% which is similar to the results obtained by the studies done by Kulkarni et. al (69.3%) and Dasgupta et. al (62.85%).[15,16]

Along with these polyps, there were four cases (6.06%) of Mucormycosis out of 19 non-neoplastic lesions occurred in nose and paranasal sinuses in the present study. Grossly, tissue fragments are often hemorrhagic and dark in appearance owing to tissue necrosis.[17] Histopathologically, H & E stained sections and use of special stains like PAS and GMS in doubtful cases showed the presence of broad, aseptate, thin walled haphazardly branched filaments. According to the study done by Seema K et al,[18] and Kalpana et al,[19] they had similar incidence of 4 cases of mucormycosis

The non-neoplastic lesions of the middle ear contributed to about 18 cases in the present study. The most common age group affected in our study was 31- 40 years. The youngest patient affected was 7 years old and the oldest was 74 years old. There was female preponderance in the present study with 11 cases of females (61.1%) and 7 cases of males (38.8%). In the present study, the most common non-neoplastic lesion in middle ear was Chronic suppurative otitis media that is of 7 cases (38.8%) followed by Cholesteatoma of 6 cases (33.3%).

In the study done by Neeru M Agarwal et al,[20] there were 12 cases (30% of non-neoplastic lesions) of cholesteatoma. The most common age group affected by cholesteastoma was 41-50 years in the present study but in the study conducted by Neeru M Agarwal et al,[20] was 11-20 and 31-40 years with 4 cases in each age group..

There were no non-neoplastic lesions involving the pharyngeal region in the present study.In the larynx, the non-neoplastic lesions contributed to about 18 cases out of all 66 cases. According to the study conducted by Om Prakash et. Al,[21] they contributed to about 48 cases. The most common age group involved by the above lesions was 41-50 years with youngest age affected was 27 years and oldest was 80 years old. The present study showed male preponderance with 12 cases (66.6%) and the females constitured 6 cases (33.3%) of females with sex ratio of 2:1 which is similar to the study conducted by Om Prakash et al,[21] with sex ratio of 2.5:1.

The vocal cord polyps were the most common non-neoplastic lesions in the present study which contributed to about 17 cases (94.4%) and also a single case of chronic laryngitis in a 80 year old male. In contrast to our study, the vocal cord polyps contributed to about 45.83% of non-neoplastic cases in the study done by Om Prakash et. Al.[21]

Among the 134 neoplastic lesions the benign lesions accounted for 21 cases. The total number of benign lesions which affected the oral cavity including tongue was 9 cases. In the study done by Modi et. al,[7] the incidence of benign lesions affecting the oral cavity was 33 cases and in the study done by Kosam et. Al,[8] there were 14 cases.

The most common age group affected by these lesions was 71-80 years whereas in the study done by Modi et al,[7] squamous papilloma accounts for about 9 cases (26.47%) and in the study conducted by Kosam et al,[8] they constituted to about 2 cases (14.28%) only.

Squamous papillomas are white to pink cauliflower like surface epithelial proliferations with prescence of HPV antigens verified by immunoperoxidasemethod in approximately 50% of cases. Histologically, the solitary squamous papilloma is a localized exophytic growth consisting of multiple papillary epithelial projections supported by delicate fibrovascular cores.

We also had three cases of Ameloblastoma which was similar to the results obtained in the study conducted by Kosam et al.[8] Ameloblastoma, the most frequent odontogenic neoplasm, occurs most often in the mandible, particularly posteriorly. They range greatly in gross appearance from entirely solid to partly cystic. Histologically, it is composed of epithelium and does not show induction of dental hard tissues.[22] Based on various clinical and pathological features, they are four types: Solid / Multicystic type, Unicystic, Desmoplastic and Peripheral.

The benign lesions of the nose and paranasal sinuses accounted to about 6 cases with 5 cases being in nasal cavity and one case affecting paranasal sinuses. In the study done by Khan et al,[24] 28 cases were of nasal cavity and 4 cases were of paranasal sinuses.

The most common age group among benign neoplasms in the present study was 61-70 years. In the study by A. Lathi et al on 19 cases of benign neoplasms, the common age group was 41-50 years.

The present study showed a male preponderance among the benign neoplasms with 4 cases seen in males and 2 cases in females with a male tofemale ratio of 2:1. According to the study done by A. Lathi et al,[13] out of 19 cases of benign neoplasms, 12 cases were seen in males and 7 cases in females, showing male preponderance with sex ratio of 1.7:1. In contrary, female preponderance was observed among 19 cases of benign neoplasms in the study done by Parajuli S et al.[14]

Inverted papilloma was the commonest benign neoplasm in this study constituting 4 cases out of 6 benign lesions that is of 66.6%. According to the study done by Jyothi A Raj et al,[12] there were 2 cases of inverted papilloma (16.67%) and in the study done by Seema K Modh et Al,[18] this benign lesion accounts for 4 cases (11.1%). These lesions were common in males which is similar to the incidence of this lesion in the studies conducted by Jyothi A Raj et al[12] and Seema K. Modh et al.[18]

Inverted papillomas approximately accounts for 47-73% of all Schneidarian papillomas with male preponderance commonly affecting 40-70 years. Most common location being the lateral wall of the nose and are typically unilateral. Histologically, they have endophytic growth pattern with thickened squamous epithelium and mixed inflammatory infiltrate seen in all layers of the surface epithelium. Approximately, 38% show positive for HPV 6 and 11.[23]

In the present study, two cases of capillary hemangioma which were seen in males and in the study conducted by Kalpana Kumari et al,[19] similar results were obtained. But in contrast to both the studies, there were 7 cases of capillary hemangioma in the study conducted by Khan et al.[24]

There were no benign lesions observed of middle ear or mastoid in our study. In pharynx, a single benign lesion was observed in our study that is nasopharyngeal angiofibroma in a 55 year old male but in contrast to our study, nasopharyngeal angiofibroma constituted to about 24 cases in the study done by Khan et al,[24] and 6 cases were seen in study done Jyothi A Raj et. al.[12]

Angiofibromas appear as sessile or lobulated masses but may occasionally be polypoidal or pedunculated. Histologically, angiofibromas are unencapsulated and characterized by a fibrocollagenous stromal proliferation with an admixture of variably sized vascular spaces. Mitotic figures are rare and the stroma may be focally myxoid.[25]

The benign lesions of larynx constituted to about 5 cases in the present study but in the study conducted by Om Prakash et al,[21] it was only of 2 cases. In our study, the most common age group affected was 41-

50 years and there was male preponderance with 3 cases affecting them and two cases affecting females. The most common benign lesion observed in our study was squamous papilloma constituting to about 4 cases (80% of all benign lesions in larynx) but in the study conducted by Om Prakash et al,[21] this lesion constituted to only a single case (50%).

In the present study we had a case of angiofibroma of larynx which is a rare lesion at this site in a 55 year old female. In the study conducted by Connie Angel et al,[26] it was seen in a 51 years old male. According to study conducted by Renukananda et al,[27] it was seen in a 65 years old male.

In the present study, the total number of malignant neoplasms were 113 occurring in the upper aerodigestive tract. But in the study conducted by David P.

Skarsgard et al,[1] the total number of cases were 16,577 in Ontario (Canada) and 42,990 cases in USA between 1982-1994.

The most common age group affected in this study were of 51-60 years that is of 25.6% of cases and followed by 41-50 years along with 61-70 years old constituting to 22.12% each respectively. According to the study done by Mir Sajad et. al,[4] the most common age group affected was also 51-60 years. But in the study conducted by David P. Skarsgard et al,[1] it was 61-70 years both in Ontario and USA.

There was male preponderance in the study, with male to female ratio of 2.2:1. Both the studies done by Mir sajad et al,[4] and Sabageh et al,[2] showed male preponderance in the cases of malignant neoplasms of upper aerodigestive tract which accounts to sex ratio of 1.8:1 and 3.1:1 respectively. This male preponderance has been putatively attributed to various environmental factors including cigarette smoking, alcohol consumption, tobacco and nut chewing which are known to be more prevalent among males.[2]

The most common site involved in the development of malignant neoplasms in the upper aerodigestive tract was oral cavity including tongue which constitutes to about 50% of cases followed by pharynx (including oropharynx, nasopharynx and hypopharynx) accounting to about 24.77% of cases. Among the malignant neoplasms in upper aerodigestive tract, the most common histological type was squamous cell carcinoma which accounts for 104 cases constituting to about 92.03% which is followed by 4 cases each of Non- Hodgkin's Lymphoma and nasopharyngeal carcinoma constituting to 3.53% each. There was a single case each of sinonasal carcinoma and adenocarcinoma (0.88% each).

In the study conducted by David P Skarsgard et al,[1] the most common histological type of malignant neoplasms in the upper aerodigestive tract region was of squamous cell carcinoma accounting for 94.1% in Ontario and 94.6% in USA. Glandular malignancies accounted to 3.9% and 3.8% in Ontario and USA respectively and sarcomas constitute about 0.9% and 0.5% in Ontario and USA respectively. Rare tumors like Esthesioneuroblastoma, Melanoma etc. accounted for 1.1% each in Ontario and USA respectively.

Squamous cell carcinomas in these anatomical sites showed keratinizing and non-keratinizing types and verrucous, microinvasive and basaloid variants were observed in this study. Among the various anatomical sites present in upper aerodigestive tract the most common site for the development of squamous cell carcinoma was Oral cavity.

In this study, the squamous cell carcinomas of the oral cavity accounted for 52 cases that is 50% of all squamous cell carcinomas that occurred in upper aerodigestive tract. In the study conducted by Kyong Ja Cha et al,[3] it accounted for 29.3% and in the study conducted by David P. Skarsgard et al,[1] squamous cell carcinomas occurring in oral cavity accounted for 27.7% in Ontario and 27.4% of all squamous cell carcinoma cases in USA. But in contrast to above

According to the studies conducted by Mir Sajad et al,[4] Kyong Ja Cho et al,[3] and Sabegah et al,[2] the most common site involved in the development of malignant neoplasms in upper aerodigestive tract was pharynx which accounts to 42.39%, 30.47% and 38.70% respectively.

In this study, the squamous cell carcinomas of the oral cavity accounted for 52 cases that is 50% of all squamous cell carcinomas that occurred in upper aerodigestive tract. In the study conducted by Kyong Ja Cha et al,[3] it accounted for 29.3% and in the study conducted by David P. Skarsgard et al,[1] squamous cell carcinomas occurring in oral cavity accounted for 27.7% in Ontario and 27.4% of all squamous cell carcinoma cases in USA. But in contrast to abovementioned studies, they accounted for about 6.52% and 9.67% only in the studies conducted by Mir Sajad et al,[4] and Sabageh et al,[2] respectively.

In this study, there were three variants of squamous cell carcinoma namely, verrucous carcinoma accounting for 2 cases in oral cavity, microinvasive squamous cell carcinoma and basaloid variant, both of which accounted for one case each in oral cavity. Verrucous carcinoma accounted for 5% of all oral cancers. It appears as a relatively well-circumscribed, elevated, nodular mass with a surface that may be pebbled, papillary, verrucous, or smooth. Microscopically, it is well-differentiated squamous epithelium that exhibits orderly maturation in both upward and downward neoplastic growth. Typically, the epithelial downgrowth is made up of broad, blunt rete pegs that appear to be "pushing" into submucosa.

In this study, the most common malignant lesion in nose and paranasal sinuses was also squamous cell carcinoma and adenocarcinoma each of 2 cases respectively out of 6 malignant lesions at this site. These malignant lesions accounted for 33.3% of all malignant lesions at this particular site. According tothe study done by Mir Sajad et al,[4] squamous cell carcinoma at nose and paranasal sinuses accounts for about 9 cases, that is 45% of all malignancies occurring at that particular site and 3 cases of adenocarcinoma which accounts to 15% of malignant

tumors at nose and paranasal sinuses. In the study done by Sabageh et al,[2] there were 6 cases of squamous cell carcinoma and 3 cases of adenocarcinoma which accounts to 50% and 25% respectively occuring at nose and paranasal sinuses.
In the study done by Khan et al,[24] the total number of adenocarcinoma cases were two with sex ratio of 1:1 and in the study conducted by Seema K Modh et al,[18] there was only one male case.
In this study, there was a single case of Non-Hodgkin's Lymphoma affecting the nose and paranasal sinuses that is of extranodal NK / T Cell Lymphoma type. It was seen in a 55 year old male presented with a growth at tip and ala of nose. The histopathological diagnosis was confirmed by immunohistochemistry markers.
In the study done by Kalpana Kumari et al,[19] the total number of Non- Hodgkin's Lymphoma cases were 3 of which two were males and one was female and in the study conducted by Dasgupta et al,[16] there were 2 cases with one case each in male and female respectively.
In this study, there were no malignant lesions that involved the middle ear and mastoids. In pharynx (including all three parts), the most common malignant lesion was squamous cell carcinoma accounting for 23 cases that is 22.11% of all squamous cell carcinoma cases occurring in upper aerodigestive tract. In the study conducted by Kyong Ja Cha et al,[3] there were 603 cases of squamous cell carcinoma at this region accounting for about 27.7% of all squamous cell carcinoma cases in upper aerodigestive tract.
The total number of cases affected by squamous cell carcinoma in oropharynx were 10 cases, in nasopharynx only one case and in hypopharynx there were 12 cases. Hence, the most common portion involved in pharynx was hypopharynx accounting for 52.17% of all squamous cell carcinomas in pharynx. In the study conducted by Kyong Ja Cha et. al,[3] the total number of cases affecting oropharynx were 222, nasopharynx were 144 and in hypopharynx it was 237 which accounted for 39.30% making it the most common affected site by squamous cell carcinoma in pharynx. According to the study done by Mir Sajad et al,[4] out of 32 squamous cell carcinoma cases, 12 were seen in nasopharynx, 4 in oropharynx and 16 in hypopharynx which accounted for 50% of all squamous cell carcinoma cases in pharynx.
In the present study, larynx constituted 27 malignant cases out of total 113 malignancies in upper aerodigestive tract. The most common age group affected was 61-70 years of age constituting 9 cases followed by 41-50 and 51-60 years age each with 7 cases. There was male preponderance with 23 cases affecting males and only 4 cases occurred in females with sex ratio of 5.75:1.
In this study all the 27 cases of malignant lesions of larynx were squamous cell carcinomas and they constituted about 25.96% of all squamous cell carcinoma cases of upper aerodigestive tract. In the study conducted by Kyong Ja Cha et al,[3] the malignant lesions in larynx accounted for 739 (26%) of which 727 cases were of squamous cell carcinomas constituting about 33.4% of all squamous cell carcinoma cases in upper aerodigestive tract.According to the study done by Mir Sajad et al,[4] the malignant lesions in larynx accounted for 19 cases (20.65%) of which 18 were of squamous cell carcinoma constituting to 26.86% of all squamous cell carcinoma in upper aerodigestive tract. In the study done by Sabageh et al,[2] the total number of malignant cases seen in larynx were 19 of which all of them were of squamous cell carcinoma constituting to about 47.5% of all squamous cell carcinoma which occurred in upper aerodigestive tract.

CONCLUSION

The present study concluded that, as most non-neoplastic and neoplastic lesions of the upper aerodigestive tract have similar clinical manifestations and radiological appearances, only provisional diagnosis can be made in these cases. Many of these lesions are inaccessible to FNAC and some are not recommended for fear of hemorrhage. The correct and final diagnosis can be made only by histopathological examination. Therefore, histopathological diagnosis is mandatory for proper early treatment and to assess the prognosis of these patients.

REFERENCES

1. Skarsgard David P, Groome PA, MAckillop WJ, Zhou S, Rothwell D, Dixon PF, et al. Cancers of the upper aerodigestive tract in Ontario, Canada, and the United States. Cancer 2000;88:1728-1738.
2. D Sabageh, TO Solaja, BJ Olasode. Malignant tumors of the upper aerodigestive tract as seen in a Nigerian tertiary health institution. Nigerian Journal of Clinical Practice 2015;18(2):231-235.
3. Kyung-Ja Cho, Shin-Kwang Khang, Seung-Sook Lee, Jae-Soo Koh, Jin-Haeng Chung, Yong-Sik Lee, Yoon-Sang Shim. Cancers of the Upper Aerodigestive Tract in Korea. J Korean Med Sci 2002;17:18-22.
4. Mir Sajad, J B Singh, Shujata Ali, Naseema Chanda, Shafaqat Ahmed, Masood Ahmed, Mohammad Lateef. Cancers of the Upper Aerodigestive tract in Kashmir (A Clinico-Pathological Study). JK-Practitioner 2004;11(1):17-20.
5. Adeyemi BF, Adekunle LV, Kolude BM, Akang EE, Lawoyin JO. Head and neck cancer – A clinicopathological study in a tertiary care centre. J Natl Med Assoc 2008;100:690-697.
6. Altumbabic H, Salkic A, Ramas A, Burgic M, Kasumovic M, Brkic F. Pattern of head and neck malignant tumours in a Tuzla ENT clinic – A five year experience. Bosn J Basic Med Sci 2008;8:377-380.
7. Modi D., Singh R., Sharma L. C., DeBnath K. Pattern of oral cavity lesions in a tertiary care hospital in Manipur. J Med Soc. 2013;27(3):199–202.
8. Kosam S., Kujur P. Pattern of oral cavity lesions: A retrospective study of 350 cases. Int J Sci Study. 2016;4(3):65–69.
9. Meltzer EO, Szhwarcberg J, Pill MW. Allergic rhinitis, asthma and rhinosinusitis: diseases of the integrated airway. J Manag Care Pharm 2004;10:310-317.
10. Juan Rosai. Chapter 5, In: Rosai and Ackerman's Surgical Pathology. 10th edition; Vol I; 2012:237-252.

11. Jaison J., Tekwani D. T. Histological lesions of nasal cavity, paranasal sinuses and nasopharynx. Ann Appl Bio Sci. 2015;2(2):41–46.
12. Raj J. A., Sharmila P. S., Shrivastava M., Mahantachar V., Rajaram T. Morphological spectrum of lesions in the sinonasal region. J Evol Med Dent Sci. 2013;2(37):7175–7186.
13. Lathi M. M. A., Syed P., Kalakoti P., Qutub D., Kishve S. P. Clinicopathological profile of sinonasal masses: a study from a tertiary hospital in India. Acta Otorhinolaryngol Ital. 2011;31:327–377.
14. Parajuli S., Tuladhar A. Histomorphological spectrum of masses of the nasal cavity, paranasal sinuses and nasopharynx. J Pathol Nepal. 2013;3:351–355.
15. Kulkarni A. M., Mudholkar V. G., Acharya A. S., Ramteke R. V. Histopathological study of lesions of nose and paranasal sinuses. Indian J Otolaryngol Head Neck Surg. 2012;64(3):275–289.
16. Dasgupta A., Ghosh R. N., Mukherjee C. Nasal polyps – Histopathologic spectrum. Indian J Otolaryngol Head Neck Surg. 1997;49:32–36.
17. Wenig B. M. Chapter 3. In: Atlas of Head and Neck Pathology. 2nd ed. 2008:12–38.
18. Modh Seema. K., Delwadia K. N., Gonsai R. N. Histopathological spectrum of sinonasal masses – A study of 162 cases. Int J Curr Res. 2013;5(3):83–91.
19. Kalpana Kumari M. K., Mahadeva K. C. Polypoidal lesions in the nasal cavity. J Clin Diagn Res. 2013;7(6):1040–1042.
20. Neeru Agarwal . M., Popat V. C., Traviad C., Srivastava A. Clinical and histopathological study of mass in ear. Indian J Otolaryngol Head Neck Surg. 2013;65(3):520–525.
21. Om Prakash, Singh P., Sharma M., Kapoor M. Pattern of benign lesions of larynx. Int J Med Sci Public Health. 2016;5(9):1808–1813.
22. Christopher Fletcher D. M. Chapter 6. In: Diagnostic Histopathology of Tumors. Vol 1. 2013:255–257.
23. Bruce Wenig M. Chapter 4. In: Atlas of Head and Neck Pathology. 2nd ed. 2008:65–130.
24. Khan N., Zafar U., Afrozi N., Ahmad S. S., Hafan S. A. Masses of nasal cavity, paranasal sinuses and nasopharynx: a clinicopathological study. Indian J Otolaryngol Head Neck Surg. 2006;58:233–237.
25. Christopher Fletcher D. M. Chapter 4. In: Diagnostic Histopathology of Tumors. Vol 1. 2013:101–102.
26. Connie Angel J, Joseph M. C., Chua A. H. Extranasopharyngeal angiofibroma of larynx. Philipp J Otolaryngol Head Neck Surg. 2010;25(1):23–25.
27. Renukananda G. S., Basavaraja P. K. Angiofibroma of larynx. Indian J Otolaryngol Head Neck Surg. 2008;60:51–52.