Histopathological Typing and Topographic Distribution of Head and Neck Lesions: An Eight-Year Retrospective Study

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Abstract

Objective: To analyze the histopathological pattern of head and neck lesions with respect to demographic findings referred to the histopathology lab of Peshawar Medical College (PMC).

Study Design: Descriptive cross-sectional study.

Place and Study duration: Histopathology laboratory of PMC, Peshawar, Pakistan. Jan 2010 to Dec 2018.

Materials and Methods: A retrospective study was conducted on a total of 743 specimens submitted to the histopathology lab for diagnosis. Variables like age, gender, site, and histopathological spectrum were evaluated. Statistical Package for Social Sciences (SPSS) version 19 was used for descriptive and inferential statistics considering *p*-value ≤0.05 significant.

Results: In our study <30 age group was common for head and neck lesions. Females were frequently affected than males. A maximum number of diagnosed lesions was benign in nature with goiter as the most common lesion. Oral squamous cell carcinoma (OSCC) was a widespread malignant neoplasm. According to the site, the thyroid showed 36% of lesions followed by 9.5% lip and oral cavity and lymph nodes respectively.

Conclusion: This study concluded a variety of head and neck lesions with respect to age, gender, and site in our region that can help in improved understanding, management, and control of the disease.

Keywords: Head and Neck, Histopathology, Benign tumors, Malignant tumors.

Introduction

Head and neck cancers represent the sixth most common cancer occurring in the world.[1] Globocan 2018 estimated 650,000 incidences and 330,000 deaths per year worldwide.[2] Pakistan being a third-world country is facing a rise in the burden of these cancers. 90% of head and neck lesions are malignant in nature with OSCC as frequently encountered neoplasia.[1]

The Head and neck region is composed of different types of tissues giving rise to a variety of lesions unique in their histological presentation. These lesions include developmental cysts, odontogenic cysts, inflammation, goiter, salivary gland swellings, oral potentially malignant disorders (OPMDs), swellings of soft tissue, and malignancies like squamous cell carcinoma (SCC), basal cell carcinoma (BCC), and melanoma.[3,4,5]

The distribution of sub-sites in head and neck cancers are related to the type of risk factors in various regions. Common sites included are lips, oral cavity, upper aero-digestive tracts, salivary glands, thyroid glands, eye, ear, and neck. Several etiological factors are associated among which alcohol has a major role in upper aero-digestive tract lesions. Besides, tobacco (smoked and smokeless), viral (HPV and EBV) infection, fungal infection, and mutations are other risk factors.[6,7,8]

Being a developing country we are lacking in data registry of various diseases so, this study aims to document different types of head and neck lesions commonly reported to our center. The review of the histopathological spectrum concerning demographic details might be helpful to see changing trends of the diseases.

Materials and Methods

The present retrospective descriptive analysis was carried out at the histopathology lab of PMC after Institutional Review Board (IRB) clearance. Non-probability consecutive sampling technique was adopted. The total 743 biopsies referred to our lab were diagnosed on H&E slides as head and neck lesions from 2010 to 2018. Histochemical staining and immunohistochemistry were performed required for confirming the diagnosis. All cases were reviewed concerning demographic findings and histopathological types by two histopathologists. The sub-sites of the head and neck included were maxilla, mandible, oral cavity, lip, salivary glands, lymph nodes, eye, ear, nose, and thyroid gland. World Health Organization (WHO) criteria were used for histopathological diagnosis of all lesions. Any missing required information of the patient like demographic data and histopathology were excluded.

The data was assessed with SPSS version 19. Mean and standard deviations were measured for a continuous variable like age. The Chi-square test was used to compare categorical variables. A probability value of less than and equal to 0.05 (P≤0.05) was considered statistically significant.

Results

This study consisted of a total number of 743 head and neck lesions commonly presenting in the age range of < 30 years followed by 31-40 age groups with mean age (34.9) and ± S.D 18.5. Females (62%) were more affected than males (38%) with male to female ratio of 1:1.7. The relationship between gender and age was found to be statistically significant (P-value< 0.05). (Table 1)

Table 1: Distribution of cases according to age groups and gender

		Gender		*Total*
		Male N (%)	Female N (%)	N (%)
Age Groups	<30	126 (45)	211 (45)	337 (45)
	31-40	28 (10)	112 (24)	140 (19)
	41-50	41 (15)	77 (17)	118 (16)
	51-60	52 (18)	43 (9.2)	95 (13)
	61-70	24 (8)	16 (3.4)	40 (5.3)
	71-80	9 (3.2)	2 (0.4)	11 (1.4)
	>80	0	2 (0.4)	2 (0.3)
Total		280 (38)	463 (62)	743

The maximum number of benign tumors were identified in the age group of <30 followed by inflammatory lesions. No oral potentially malignant disorder was reported in the present study in the age range of <30 and 31-40 years. The age group of 51-60 showed a high number of head and neck cancers while in > 80 years age group only two malignant tumors were diagnosed. The relationship between the histopathological spectrum and age was found to be statistically significant (P-value< 0.05). (Figure 1)

Of all the sites thyroid gland (36%) was the most common site involved. The second frequent site was the lip and oral cavity (9.5%) and lymph nodes (9.5%).

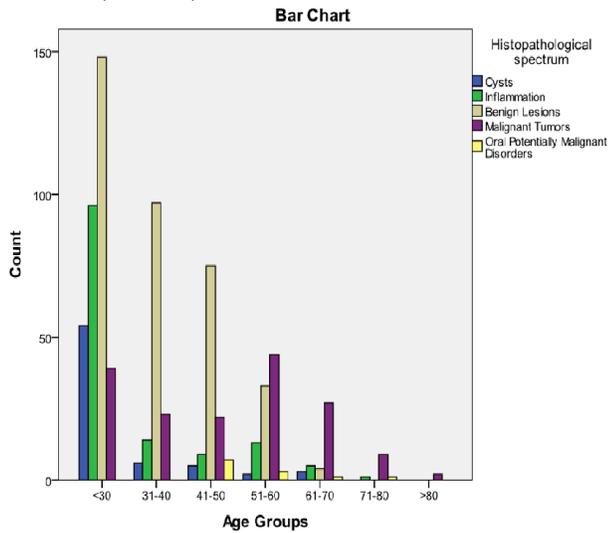Lymph nodes showed a high number of inflammatory lesions. (Table 2)

Figure 1: Histopathological spectrum with respect to age groups

Among lip and the oral cavity, the highest number of cases was found on the lip (29%). Tongue (18%) was the second affected site followed by buccal mucosa (10%). OPMDs (leukoplakia) were common in the lip and oral cavity. (Table 2)

The submandibular gland (53%) was frequently involved site among salivary glands followed by the parotid gland (39%). The relationship between site and histopathology was found to be statistically significant (P-value< 0.05). (Table 2)
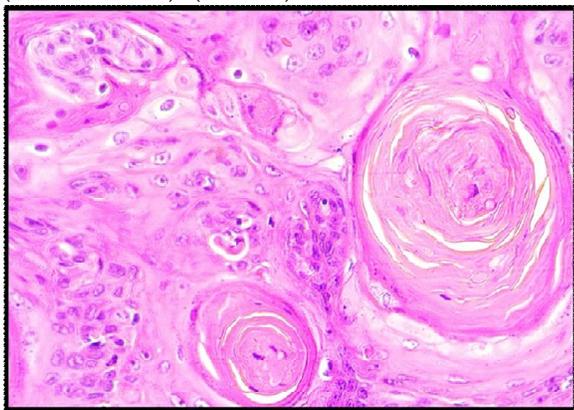

Figure 2: Photomicrograph of well-differentiated squamous cell carcinoma (H&E, 40X)

As far as the histopathological spectrum of the head and neck is concerned, benign lesions (48%) were more often diagnosed in our analysis (Table 2). Goiter (60%) was the most common benign lesion followed by a

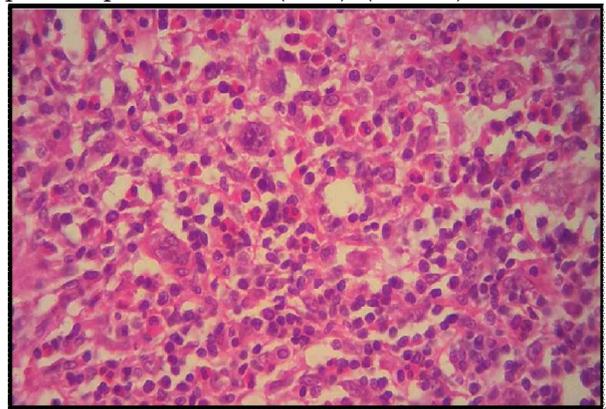lipoma (7.3%), follicular adenoma (7.3%), and pleomorphic adenoma (6.2%). (Table 3)

Figure 3: Photomicrograph of Hodgkin lymphoma (H&E, 40X)

Cancers (22%) were the second common neoplasm (Table 2). Among head and neck cancers, SCC comprised a high number of cases (35%) with BCC at the second place (23%). (Table 3)

In the present study, reactive lymphadenitis (27%) was a commonly observed inflammatory lesion while developmental cyst was a common head and neck cyst (56%). (Table 3)
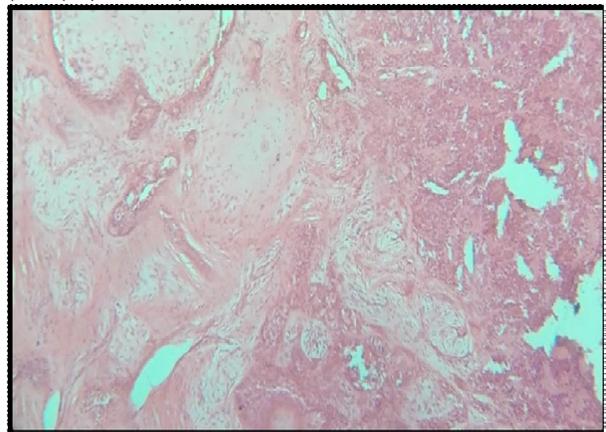

Figure 4: Photomicrograph of pleomorphic adenoma (H&E, 4X)

Table 2: Distribution of head and neck lesions based on sites

Sites n (%)	Sub-sites	Cysts	Inflammations	Benign lesions	Potentially malignant	Malignant tumors	Total (%)
Lip & Oral cavity 71 (9.5)	Alveolarmucosa	0	1	0	3	2	6 (8.4)
	Buccal mucosa	0	3	3	3	1	10 (14)
	Gingiva	0	4	2	1	0	7 (9.8)
	Hard palate	0	1	0	0	2	3 (4.2)
	Tongue	0	5	3	0	5	13 (18)
	Lip	2	7	3	0	9	21 (29)
	Not mentioned	1	4	3	0	3	11 (15)
Maxilla 31 (4.1)		15	4	10	0	2	31
Mandible 41 (5.5)		14	8	17	1	1	41
Salivary glands 41 (5.5)	Parotid gland	0	0	11	0	5	16 (39)
	Submandibular gland	0	7	11	0	4	22 (53)
	Sublingual glands	0	1	0	0	0	1 (2.4)
	Minor salivary glands	0	0	1	0	1	2 (4.8)
Larynx 17 (2.2)	Supra-glottic	0	2	0	0	0	2 (11)
	Sub-glottic	0	1	0	0	0	1 (5.8)
	Vocal cords	0	5	3	0	2	10 (58)
	Not mentioned	0	0	0	1	3	4 (23)
Oropharynx 1 (0.1)	Tonsil	0	1	0	0	0	1
Hypopharynx 1 (0.1)		0	0	0	0	1	1
Nasopharynx 5 (0.6)		0	1	1	0	3	5
Face 38 (5.1)		10	2	5	1	20	38
Nose 44 (5.9)		3	11	4	1	25	44
Eyes 23 (3)		3	1	4	0	15	23
Ear 11 (1.4)		2	3	3	0	3	11
Scalp 16 (2.1)		1	5	7	1	2	16
Thyroid gland 274 (36)		0	4	241	0	29	274
Parathyroid gland 2 (0.2)		0	0	2	0	0	2
Lymphnodes 71 (9.5)		0	43	0	0	28	71
Neck 56 (7.5)		19	14	23	0	0	56
Total		70 (9.4)	138 (18)	357 (48)	12 (1.6)	166 (22)	743 (100%)

Table 3: Frequency of histopathological types of most common Head and Neck Lesions

Common lesions	Number of cases N (%)	Total number of cases N
Goiter	215 (60)	357
Squamous cell carcinoma	59 (35)	166
Developmental cyst	39 (56)	70
Basal cell carcinoma	38 (23)	166
Reactive lymphadenitis	37 (27)	138
Inflammatory polyp	28 (20)	138
Lipoma	26 (7.3)	357
Follicular adenoma	26 (7.3)	357
Pyogenic granuloma	23 (17)	138
Pleomorphic adenoma	22 (6.2)	357
Papillary carcinoma	18 (11)	166
Hodgkin lymphoma	17 (10)	166

Discussion

Head and neck lesions include diverse pathologies ranging from inflammation to malignant tumors. These lesions are sometimes challenging due to their unique presentation in terms of epidemiology, topography, and pathology. Based on the findings of the present analysis, females (62%) were more affected than males (38%). The majority of the studies conducted across the globe showed conflicting results with head and neck lesions generally seen in males.[5, 9, 10] But studies from different regions like Brazil and India were in accordance with our evaluation with female predominance.[11-14] The possibility of more females in our study might be due to variation in sample size and may reflect regional differences.

These lesions can be diagnosed in any age group but are usually present in young adults. Our research also concluded the same outcome with the <30 age group seen as the most common.[4,9,11,15,16] One of the studies conducted in Iran showed the maximum number of cases in the age group of ≥40 years differing from our analysis.[17] A high number of malignant neoplasms were identified in the age group of 51-60 years which showed that chances of getting malignancy increase with age.[3,18,19]

Head and neck lesions showed involvement of different sites with the greatest number of cases identified in the thyroid gland (36%). These findings are also supported by other studies.[9,17] Some of the research work found lymph nodes as the most common site for head and neck lesions contrary to present results.[20,21,22] Lip and oral cavity and lymph nodes were equally involved (9.5%). However, lip (29%) was the commonest sub-site of involvement followed by the tongue (18%) and buccal mucosa (14%) for malignant lesions.[22,23]

Nose (5.9%), the mandible (5.5%), and salivary glands (5.5%) were also found to be frequently involved sites.[4,20,24]

Our data suggested that maximum cases were benign (48%) in nature with head and neck cancers (22%) in second place. Comparable observations were reported by different studies.[4,16,21,24] However Lie *et al* showed a fewer number of benign lesions.[5] Contradictory results by other studies were also found presenting the greatest number of inflammatory lesions.[25,26]

Among all biopsies, a wide variety of benign lesions were recognized. The most frequent was goiter (60%), common in the age range of 41-50 years with female predominance. Benign tumors like follicular adenoma (7.3%), lipoma (7.3%), and pleomorphic adenoma (6.2%) were common. Irani S, Urooj A and Sharma M *et al* findings were in line with our work[3,9,17] while few documented literature concluded reactive lymphadenitis and epidermoid cyst as numerous lesions.[11,16,21,24]

Head and neck cancer remains alarming and the fourth most health burden in developing countries like Pakistan. In our evaluation, frequently encountered cancer was SCC (35%) presented in the age group of 51-60 years commonly in males which are in synchronization with documented literature.[4,5,19,27,28,29,30] Increase in the number of cancer cases in Khyber Pakhtunkhwa (KP) might be attributed to the common consumption of smokeless tobacco (naswar) in addition to other risk factors.

BCC (23%) was the next frequently seen malignancy in our patients followed by papillary carcinoma (11%) and Hodgkin lymphoma (10%).[17,29] In Iran, BCC, and Brazil, mucoepidermoid carcinoma was prevalent in malignant neoplasms respectively.[12,15]

The common inflammatory lesion analyzed in this study was reactive lymphadenitis (27%). Among the rest of the lesions, inflammatory polyps (20%) and pyogenic granuloma (17%) were often diagnosed.[11,21]

Limitation

This study is confined to a single institute so it cannot reflect the entire population.

Conclusion

The current study highlighted the prevalence of various head and neck lesions in KPK referred for histopathological diagnosis. Our study concludes <30 age range is the commonest with a female predilection. Histological diagnosis showed goiter as the most common benign lesion and squamous cell carcinoma as prevalent malignancy. It is a small effort that might help promote the need for establishing a national population-based registry in Pakistan which will help pathologists and surgeons in updating their knowledge and planning of treatment of these lesions. Further studies are recommended to see the patterns of head and neck lesions along with their changing trends to establish a better control scheme.

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