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Salivary Gland Tumors - A Three Year Retrospective Study

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ABSTRACT

Background: Neoplastic lesions of salivary gland are uncommon and shows varied morphology. It comprises 5-6 % of all tumors of head and neck. Salivary neoplasms are more likely to occur in relatively old age (6th decade). Benign salivary gland tumors usually occur relatively earlier (4th-5th decade) than malignant tumors. Tumors of salivary glands usually present as mass in otherwise normal gland. Uncommon presenting complaints such as facial paralysis in presence of neoplastic growth usually suggest malignant tumor invading facial nerve. Our aim is to study the epidemiology, clinical presentation and distribution of various salivary glands in relation to their histopathology. **Methods:** This was a retrospective cross-sectional study conducted in the department of pathology of a tertiary care medical centre situated in an urban area. All the salivary gland tumor specimens which were received in the department over these years were studied by analyzing records from the department. Distribution of benign and malignant salivary gland tumors, their morphology and prognostic histological parameters were studied. Statistical analysis was done using SSPS 17.0 software, with P value being less than 0.05 as statistically significant. **Results:** Out of 80 studied cases there were 32 males and 48 females with a M:F ratio of 1:1.5. The mean age in male and female patients was found to be 47.41 ± 15.18 and 46.72 ± 13.68 respectively. The difference in mean age of males and females was found to be statistically insignificant (P>0.05). parotid gland was most commonly involved site (68.75%) followed by submandibular gland (23.75%) and minor salivary glands (5%). Amongst benign pathologies pleomorphic adenoma was found to be the most common lesion encountered(31.25%) followed by warthin's tumor (11.25%) and myoepithelioma (5%). The most common malignant tumor was mucoepidermoid carcinoma which was seen in 12 (17.50%) patients. **Conclusion:** Amongst all salivary glands, parotid gland was found to be most commonly affected. Most common benign and malignant tumors were found to be pleomorphic adenoma and mucoepidermoid carcinoma respectively.

Keywords: Salivary gland tumors, Histopathology.

INTRODUCTION

The salivary glands are responsible for the production, modification and secretion of saliva, which aid mastication, deglutition, digestion and protection of teeth and soft tissues. These are exocrine glands, organized into major bilaterally paired major glands (parotid, submandibular and sublingual glands) and minor glands, located throughout the oral and the oropharyngeal mucosa.[1] Ectopic salivary glands have also been reported commonly in the periparotid and intraparotid lymph nodes, soft tissue and other organs in the head, neck and chest region, rectum, vulva, stomach, pterygopalatine fossa and cellebello-pontine angle.[2]

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These glands recapitulate normal salivary glands. Salivary glands often give rise to different pathologic conditions, ranging from cystic, inflammatory, tumor-like and neoplastic lesions.[3] Salivary gland tumors (SGT) are particularly important to the pathologist and the head and neck surgeons because of their associated morbidity and mortality, and more specially because important head and neck structures like the facial nerve transverse these glands.[4]

Despite the relatively simple morphology of the salivary gland, over 35 different neoplasms have been associated with them. Considering the diverse anatomical sites and histological subtypes, it is easy to understand why otolaryngologists, head and neck surgeons, oncologists and pathologists accumulate only restricted exposure to specific types of SGTs. Heterogeneity within the individual histological subtype also poses further diagnostic challenge to the pathologist.[5]

About 5-6% of all head and neck tumors originate from one or the other salivary gland. Its incidence has been reported tone 5-6 per 100000 individuals in united states.[6] These neoplasms are more likely to occur in relatively old age (6th decade), benign salivary gland tumors usually occur relatively earlier (4th-5th decade).[7] Benign salivary gland neoplasms are more common in females whereas malignant tumors show equal distribution amongst males as well as females. The most common salivary glands to be involved in neoplastic pathology include parotid gland followed by submandibular gland and sublingual gland.[8] Almost 80% salivary gland neoplasms arise in parotid gland followed by submandibular gland (10-15%) and sublingual and minor salivary glands.[9]

It is interesting to note that as the size of gland decreases the chances of a neoplasm being malignant increases. For example, 60% of neoplastic growths in the largest salivary gland i.e. parotid glands are likely to be pleomorphic adenoma which is a benign tumor.[10]

Most of the patients with salivary gland neoplasms presents with slowly growing painless mass. Tumors of major salivary glands such as parotid gland usually present as mass in otherwise normal gland. Minor salivary glands may have varied presentation depending upon the site of neoplasm and may vary from just a palpable swelling in the floor of the mouth (submandibular neoplasms) to serious manifestations such as airway obstruction and dysphagia (laryngeal salivary gland tumors). Uncommon presenting complaints such as facial paralysis in presence of neoplastic growth usually suggest malignant tumor invading facial nerve.[11]

The diagnosis usually depends upon physical examination, Imaging (ultrasound, computerized tomography and magnetic resonance imaging) and histopathological examination. Management may consist of from simple excision to radical dissection and chemotherapy and radiotherapy depending upon the histopathology of tumours.[12]

With these facts in mind we conducted this study to epidemiology, clinical presentation and distribution of various salivary glands in relation to their histopathology.

MATERIALS AND METHODS

This was a retrospective cross-sectional sectional study conducted in the department of pathology of a tertiary care medical centre situated in an urban area. The duration of study was 3 years. All the salivary gland tumor specimen which were received in the department over these years were studied by analyzing records of the department.

The demographic details of the patients such as age, sex and occupation were noted from the case records obtained from department of ENT. Systemic examination findings were also noted from clinical case records. The relevant clinical details were taken from the case files of the concerned patients. If available imaging studies such as high frequency ultrasound of neck, computerized tomography and magnetic resonance imaging reports were also reviewed so as to be able to correlate imaging and histopathological diagnosis. Gross and histology findings were noted from the records of Department of pathology whereas the clinical details were obtained from department of ENT clinical record files. THE Histopathological section and paraffin blocks were retrieved from pathology department and sections were remounted whenever it was necessary to do so. The histological features of the slides were reviewed.

Incidence of various salivary gland tumors in accordance with age of the patients were noted and analyzed. Distribution of salivary glands in terms of benign as well as malignant pathologies was also noted down. Finally, the salivary gland tumors were classified on the basis of histopathology and their frequency and distribution was noted. The incidence of benign and malignant neoplasms in relation to age and sex was also studied. The patients whose case records were incomplete were excluded from the study.

The statistical analysis was done using Statistical Package for the social sciences version 17. (SSPS Inc, Chicago, IL, USA). P value less than 0.05 was taken as statistically significant.

RESULTS

A total 80 specimens were included in this study on the basis of pathology and clinical records. Out of 80 studied cases there were 32 males and 48 females with a M:F ratio of 1:1.5.

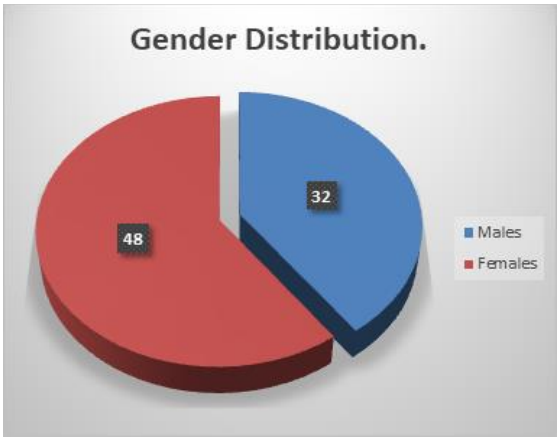

Figure 1: Gender Distribution of the studied cases.

Age distribution of the studied cases showed that the most common affected age group amongst males was 61-70 years whereas amongst female most common affected age group was found to be 51-60 years. The mean age in male and female patients was found to be 47.41 ± 15.18 and 46.72 ± 13.68

respectively. The difference in mean age of males and females was found to be statistically insignificant (P>0.05). The overall mean age of the patients was found to be 47.06 years.

Table 1: Age Distribution of the studied cases.

Age Groups	Males		Females	
	N	%	N	%
Up to 20 years	1	1.25%	2	2.50%
21-30 years	3	3.75%	7	8.75%
31-40 years	2	2.50%	9	11.25%
41-50 years	4	5.00%	10	12.50%
51-60 years	10	12.50%	15	18.75%
61-70 years	12	15.00%	5	6.25%
Total	32	40.00%	48	60.00%
Mean ± SD	47.41 ± 15.18		46.72 ± 13.68	
P>0.8330 (Not Significant), 95% CI= -7.1849 to 5.8049				

The Distribution of tumors on the basis of involved salivary gland showed that the parotid gland was most commonly involved (68.75%) followed by submandibular (23.75%) and minor salivary glands (5%). Only in 2 cases (2.5%) sublingual glands were found to be affected.

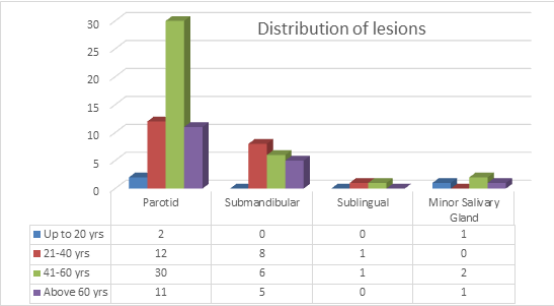

Figure 2: Distribution of lesions in various salivary glands.

Out of 80 studied specimens 46 (57.50%) specimens were found to be belonging to patients having benign pathologies. Amongst benign pathologies pleomorphic adenoma was found to be the most common (31.25%) followed by Warthin's tumor (11.25%) and myoepithelioma (5%).

Table 2: Frequency distribution of the benign salivary gland tumors.

Benign salivary gland tumors	No. of cases	%
Pleomorphic adenoma	25	31.25%
Basal cell adenoma	3	3.75%
Myoepithelioma	4	5.00%
Warthin tumor	9	11.25%
Oncocytoma	2	2.50%
Canalicular adenoma	1	1.25%
Sebaceous adenoma	2	2.50%
Total	46	57.50%

The analysis of the cases on the basis of gender distribution amongst benign lesions showed that All benign pathologies were common in females as compared to males. The most common pathology amongst male as well as females was found to be Pleomorphic adenoma (31.25%) followed by Warthin's tumor (11.25%).

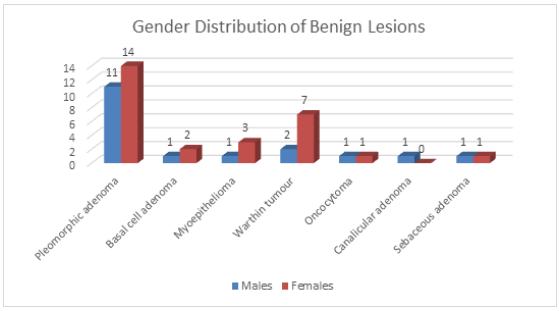

Figure 3: Gender distribution of benign salivary gland tumors.

Malignant salivary gland lesions were found in 34 (42.50%) specimens. The most common malignant tumor in the affected cases was found to be mucoepidermoid carcinoma which was seen in 12 (17.50%) patients. Other malignant tumors in the studied specimens were found to be Acinic cell carcinoma (7.50%), Polymorphous low-grade adenocarcinoma (3.75%) and Basal cell adenocarcinoma (3.75%).

Table 3: Frequency distribution of the Malignant salivary gland tumors.

Malignant salivary gland tumors	No. of cases	Percentage
Acinic cell carcinoma	6	7.50%
Mucoepidermoid carcinoma	12	17.50%
Adenoid cystic carcinoma	2	2.50%
Polymorphous low-grade adenocarcinoma	3	3.75%
Epithelial myoepithelial carcinoma	2	2.50%
Clear cell carcinoma	1	1.25%
Basal cell adenocarcinoma	3	3.75%
Sebaceous carcinoma	2	2.50%
Salivary duct carcinoma	1	1.25%
Total	34	42.50%

The distribution of malignant salivary gland tumors on the basis of gender showed that All malignant pathologies were common in females as compared to males except sebaceous carcinoma. The most common pathology amongst male as well as females was found to be Mucoepidermoid carcinoma (17.50%) followed by Acinic cell carcinoma (7.50%).

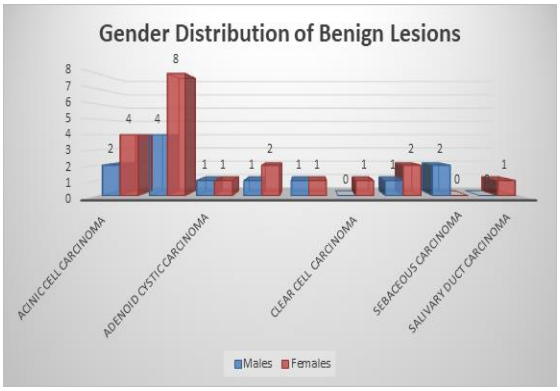

Figure 4: Gender distribution of malignant salivary gland tumors.

The analysis of histopathology of the malignant lesions showed that intraneural invasion was seen in mucoepidermoid carcinoma (3/9), acinic cell carcinoma (1/5), PLGA (1/2) and basal cell adenocarcinoma (1/2). Perineural invasion was common n mucoepidermoid carcinoma which was seen in 5 out of 12 cases. Vascular invasion and capsular invasion were seen in 2 and 5 patients out of 12 cases of mucoepidermoid carcinoma. Distant metastases were seen in mucoepidermoid carcinoma (2/10), Epithelial Myoepithelial carcinoma (1/1) and sebaceous carcinoma (1/1).

Table 4: Prognostic histological parameters of malignant salivary gland tumors

Malignant salivary gland tumors	Intraneural invasion (Y/N)	Perineural invasion (Y/N)	Vascular invasion (Y/N)	Capsular invasion / Invasion of adjacent tissue (Y/N)	Lymph node metastases (Y/N)	Distant metastases (Y/N)
Acinic cell carcinoma	1/5	2/4	0/6	3/3	2/4	0/6
Mucoepidermoid carcinoma	3/9	5/7	2/10	5/7	3/9	2/10
Adenoid cystic carcinoma	0/2	0/2	0/2	1/1	0/2	0/2
Polymorphous low-grade adenocarcinoma	1/2	1/2	1/2	2/1	1/2	0/3
Epithelial myoepithelial carcinoma	0/2	0/2	1/1	1/1	1/1	1/1
Clear cell carcinoma	0/1	0/1	0/1	0/1	0/1	0/1
Basal cell adenocarcinoma	1/2	1/2	1/2	3/0	0/3	0/3
Sebaceous carcinoma	0/2	0/2	1/1	1/1	1/1	1/1
Salivary duct carcinoma	0/1	0/1	0/1	1/0	0/1	0/1

DISCUSSION

This was a retrospective cross-sectional sectional study. In this study all the salivary gland tumor specimen which were received in the department over these years were studied by analyzing records of the department. In our study Out of 80 studied cases there were 32 males and 48 females with a M:F ratio of 1:1.5. Salivary gland tumors have been uniformly reported to be more common in females as compared to males. Torabinia N et al conducted an epidemiological study of 229 medical records of patients with salivary gland neoplasms for 10 years duration. The authors found that salivary gland neoplasms were more common in females. In this study, 48.8% of affected patients were male (112) and 51.2% were female (117).[13] Similar male preponderance was reported by Jaafari-Ashkavandi Z et al and Lee WH et al.[14,15]

The mean age of the studied cases in our study was found to be 47.06 years. Araya J et al conducted a retrospective review of salivary gland tumors diagnosed over a period of 10 years. study sample consisted of 279 salivary gland tumours. Prevalence and incidence rates per 100.000 persons were 15.4 and 2.51, respectively. Most of the neoplasms corresponded to benign tumors (70.3%). The most affected gland was the parotid gland. Pleomorphic adenoma was the most common benign tumor (53.8%) and mucoepidermoid carcinoma was the most common malignant tumor (7.2%). The mean age for benign and malignant tumors in this study was found to be 53.3 ± 19.09 and 60.9 ± 26.6 years respectively.[16]

In our study 46 (57.50%) specimens were found to be belonging to patients having benign pathologies. Amongst benign pathologies pleomorphic adenoma was found to be the most common (31.25%) followed by Warthin's tumor (11.25%) and myoepithelioma (5%). Bobati SS et al conducted a retrospective study of salivary gland neoplasms. All the cases of SGTs, which had been recorded in a 3-year period were enrolled in the study. In this study data of 59 cases of SGTs were recorded, of which 43 (69.16%) cases were classified as benign tumors and 16 (22.39%) cases as malignant tumors. Male to female ratio (M/F) and the mean age of patients were 1:1.8 and 43 years, respectively. Pleomorphic adenoma (60.71%) and adenoid cystic carcinoma (14.94%) were the most common benign and malignant neoplasms.[17] Pleomorphic adenoma was found to be most common salivary gland tumor in the studies conducted by Zarbo RJ and Peel RL et al.[18,19]

In our study Malignant salivary gland lesions were found in 34 (42.50%) specimens. The most common malignant tumor in the affected cases was found to be mucoepidermoid carcinoma (17.50%). Mucoepidermoid carcinoma has been reported to be the most common malignant salivary gland tumors by many authors. It is reported to be the most common salivary gland malignancy, accounting for approximately 30% to 35% of all malignant neoplasms of the major as well as minor salivary glands. In this regard our findings were found to be similar to the findings of the study conducted by Sathish Babu et al.[20]

CONCLUSION

Parotid gland was found to be most commonly affected. Most common benign and malignant tumors were found to be pleomorphic adenoma and mucoepidermoid carcinoma respectively. Analysis

of Prognostic histological parameters may give a fair idea about the prognosis of malignant salivary gland tumors.

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