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Original Article

Histopathological Spectrum of Salivary Gland Lesions in Tertiary Care Centre at SMS Medical College, Jaipur, Rajasthan

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ABSTRACT

Background: There are a wide spectrum of salivary gland lesions with morphologically and clinically diversity which is a difficult task for histopathological interpretation. Also, there are different and limited epidemiological data especially of rare cases of salivary gland lesions.

Material & Methods: A Laboratory based Descriptive type of Observational study done in Department of Pathology, S.M.S Medical College, Jaipur from January 2014 to December 2015. 100 cases of salivary gland lesions were included and histologically divided into non-neoplastic and neoplastic lesions. Further neoplastic lesions classified according to WHO histological typing of salivary gland tumours and analyzed statically.

Result: Out of 100 cases, 25% cases were non-neoplastic, 52% Benign and 23 % malignant lesions. In non-neoplstic lesions predominantly was chronic sialadenitis. Pleomorphic adenoma and Warthin's tumour were most common benign neoplastic lesions and in malignant neoplastic lesions, mucoepidermoid carcinoma and adenoid cystic carcinoma were common lesions. In age wise distribution male predominance seen in all salivary gland lesions, whereas female predominance seen in benign neoplastic lesions. Age wise distribution showed that non-neoplastic and benign lesions were common below 5th decade, whereas malignant lesions beyond the 5th decade. In site wise distribution non-neoplastic lesions commonly seen in submandibular gland and neoplastic lesions distributed in parotid (60%), submandibular (31%) and minor salivary glands (9%) in order of frequency. Fortunately, we found rare cases of neoplastic lesions.

Conclusion: Histopathological study of salivary gland lesions is the most important method in establishing the final diagnosis.

KEYWORDS: Salivary gland, Histopathology, Immunohistochemistry, Non-Neoplastic lesions, Neoplastic Benign lesion, Neoplastic Malignant lesion.

INTRODUCTION

The spectrum of salivary gland lesion is wide and the relative incidences of neoplastic versus non-neoplastic lesions are variable in different studies. The non-neoplastic conditions range from an inflammatory disorder of infectious, granulomatous or autoimmune etiology to obstructive, developmental and idiopathic disorders. These often present clinically as tumours and may have pathological feature similar to some of the neoplasm.[1]

Salivary gland tumours can show a striking range of morphological diversity between different tumour types and sometimes within an individual tumour mass. In addition, hybrid tumours, dedifferentiation and the propensity for some benign tumours to progress to malignancy can confound histopathological interpretation. These features, together with the relative rarity of a number of tumours, can sometimes make diagnosis difficult, despite the abundance of named tumour entities. The epidemiology of salivary gland tumours is not well documented. In many studies, the data are limited, as some are restricted to parotid gland neoplasm or tumours of major glands. In addition, most salivary gland tumours are benign and some cancer registries have only included malignant tumours.[2]

AIMS & OBJECTIVES

- To study histomorphological (gross and microscopic) aspect of Salivary gland lesions.
- To classify benign and malignant lesions according to WHO Classification.
- To study the age, sex and site distribution of various salivary gland lesions.

MATERIALS AND METHODS

A Laboratory based Descriptive type of Observational study done in Department of Pathology, S.M.S Medical College, Jaipur from January 2014 to December 2015 The sample required for our study was collected from S.M.S and attached hospitals. A total 100 biopsy specimen with clinical details received which processed and stained with routine Haematoxylin and Eosin stain and special stains like Periodic Acid Schiff and Mucicarmine stain etc. and examined microscopically. In selected cases we applied Immunohistochemistry for proper diagnosisThe lesions were differentiated in non-neoplastic and neoplastic lesions. The neoplastic lesions were classified according to the World Health Organization's histological typing of salivary gland tumors (2005). Data was entered in Microsoft office excel and tables were prepared and analyzed in the form of proportion and percentage.

RESULTS

In our study total of 34135 specimens were received for histopathological examinations during the period of two years from January 2014 to December 2015 of which 100 specimens of salivary gland lesions included, representing 0.30%.

In the study out of the total 100 cases, 25 were diagnosed as non-neoplastic lesions and 75 as neoplastic lesions of which 52 were benign and 23 were malignant. Among the all salivary gland lesions, the commonest lesion was pleomorphic adenoma which comprised of 43% of all lesions. Of the non-neoplastic lesions, sialadenitis was commonest and in malignant neoplastic lesions mucoepidermoid carcinoma was more frequent. (Table 1) From age wise distribution, it is observed that non- neoplastic lesions were common in the 3rd to 4th decade of life, benign tumours in 3rd to the 5th decade and malignant tumours were common from 5th decade onwards. Among the benign neoplastic lesions, the pleomorphic adenoma was commonly seen in 3rd to 5th decade. Warthin's tumour and Myoepithelioma were seen in the higher age group and oxyphilic adenoma and solitary fibrous tumour were seen in a lower age group.

In malignant neoplastic lesions, mucoepidermoid carcinoma found between 2nd to 8th decade, adenoid cystic carcinoma in 4th to 6th decade, carcinoma ex-pleomorphic adenoma in 3rd and 6th decade and the rest of the lesions found beyond the 5th decade**.** (Table 2)

In our study male preponderance was seen in overall salivary gland lesions, but in benign neoplastic lesions, female predominance was seen except for Warthin's tumour in which M: F ratio was 1.5:1. In malignant neoplastic lesions, there was an overall male predominance except in carcinoma ex-pleomorphic adenoma where M: F ratio was 0:2. (Table 3)

Table 1: Incidence of salivary gland lesions

LESIONS	Number	Percentage (%)
Chronic sialadenitis	22	22
Mucocele	3	3
Non Neoplastic	25	25
Pleomorphic adenoma	43	43
Warthin's tumour	5	5
Myoepithelioma	2	2
Oxyphilic adenoma	1	1
Solitary fibrous tumour	1	1
Benign Neoplastic	52	52
Mucoepidermoid Carcinoma	8	8
Adenoid cystic carcinoma	5	5
Carcinoma Ex-pleomorphic adenoma	2	2
Acinic cell carcinoma	1	1
Squamous cell carcinoma	1	1
B cell NHL	1	1
Adenocarcinoma	3	3
Carcinosarcoma	1	1
Small cell carcinoma	1	1
Malignant Neoplastic	23	23
Total	100	100

Table 2: Age- wise distribution of salivary gland lesion

Lesions	00-09	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
Chronic sialadenitis	0	2	6	6	3	4	1	0	0
Mucocele	0	1	1	1	0	0	0	0	0
Non-neoplastic	**0**	**3**	**7**	**7**	**3**	**4**	**1**	**0**	**0**
Pleomorphic adenoma	0	6	11	11	10	1	4	0	0
Warthin's tumour	0	0	0	0	2	2	1	0	0
Myoepithelioma	0	0	0	0	1	1	0	0	0
Oxyphilic adenoma	0	0	1	0	0	0	0	0	0
Solitary fibrous tumour	0	1	0	0	0	0	0	0	0
Benign Neoplastic	**0**	**7**	**12**	**11**	**13**	**4**	**5**	**0**	**0**
Mucoepidermoid Car	0	1	1	0	1	1	2	2	0
Adenoid cystic car	0	0	0	1	1	3	0	0	0
Carcinoma Ex-pleomorphic adenoma	0	0	1	0	0	1	0	0	0
Acinic cell carcinoma	0	0	0	0	1	0	0	0	0
Squamous cell carcinoma	0	0	0	0	0	0	0	0	1
B cell lymphoma	0	0	0	0	0	0	1	0	0
Adenocarcinoma	0	0	0	0	2	0	0	1	0
Carcinosarcoma	0	0	0	0	1	0	0	0	0
Small cell carcinoma	0	0	0	0	0	0	1	0	0
MALIGNANT NEOPLASTIC	**0**	**1**	**2**	**1**	**6**	**5**	**4**	**3**	**1**
TOTAL	**0**	**11**	**21**	**19**	**22**	**13**	**10**	**3**	**1**

Table 3: Gender wise distribution of salivary gland lesions

LESIONS	MALE	FEMALE	M:F Ratio
Chronic sialadenitis	17	5	3.4:1
Mucocele	3	0	3:0
NONNEOPLASTIC	**20**	**5**	**4:1**
Pleomorphic adenoma	19	24	1:1.26
Warthin's tumour	3	2	1.5:1
Myoepithelioma	0	2	0:2
Oxyphilic adenoma	0	1	0:1
Solitary fibrous tumour	0	1	0:1
BENIGN NEOPLASTIC	**22**	**30**	**1:1.36**
Mucoepidermoid Carcinoma	6	2	3:1
Adenoid cystic carcinoma	4	1	4:1
Ex-pleomorphic adenoma	0	2	0:2
Acinic cell carcinoma	1	0	1:0
Squamous cell carcinoma	1	0	1:0
B cell NHL	1	0	1:0
Adenocarcinoma	3	0	3:0
Carcinosarcoma	1	0	1:0
Small cell carcinoma	1	0	1:0
MALIGNANT NEOPLASTIC	**18**	**5**	**3.6:1**
TOTAL	60	40	1.5:1

Table 4: Site wise distribution of salivary gland lesions

Sr. No	Site	Total	Non –neoplastic	Neoplastic				% of all lesions
				Benign	Malignant	Total	% of all tumours	
1	**Parotid Gland**	60	5	38	17	55	73.34	60
2	**Submandibular**	31	16	12	3	15	20	31
3	**MSG**	9	4	2	3	5	6.66	9
	Total	**100**	**25**	**52**	**23**	**75**	**100**	**100**

From age wise distribution, it is observed that non-neoplastic lesions were common in the 3rd to 4th decade of life, benign tumours in 3rd to the 5th decade and malignant tumours were common from 5th decade onwards.

Among the benign neoplastic lesions, the pleomorphic adenoma was commonly seen in 3rd to 5th decade. Warthin's tumour and Myoepithelioma were seen in the higher age group and oxyphilic adenoma and solitary fibrous tumour were seen in a lower age group.

In malignant neoplastic lesions, mucoepidermoid carcinoma found between 2nd to 8th decade, adenoid cystic carcinoma in 4th to 6th decade, carcinoma ex-pleomorphic adenoma in 3rd and 6th decade and the rest of the lesions found beyond the 5th decade**.** (Table 2)

In our study male preponderance was seen in overall salivary gland lesions, but in benign neoplastic lesions, female predominance was seen except for Warthin's tumour in which M: F ratio was 1.5:1. In malignant neoplastic lesions, there was an overall male predominance except in carcinoma ex-pleomorphic adenoma where M: F ratio was 0:2. (Table 3)

In the study, the sites of all salivary gland lesions were parotid (60%), submandibular (31%) and minor salivary glands (9%) in order of frequency. Chronic sialadenitis was commonly seen in submandibular gland and mucocele in the minor salivary gland.

In Myoepithelioma, there was an equal distribution in the parotid gland and minor salivary gland. The B-cell NHL was commonly seen in submandibular gland and there was an equal distribution of adenoid cystic carcinoma in parotid and minor salivary gland. (Table 4)

DISCUSSION

In our study total, 100 cases of salivary gland lesions were processed from January 2014 to December 2015 and applied Immunohistochemistry for proper differentiation. During this period, we also found rare cases of salivary glands.

In our study out of 100 cases we found 25% cases of non-neoplastic lesions and among them 88 % were of chronic sialadenitis with the peak incidence of 20 to 40 year and M:F ratio of 3.4:1. This study is similar to study done by Laishram et al[3] where in the non-neoplastic lesions 84.62% of cases were chronic sialadenitis with age incidence of 20-30 years and M:F ratio was 1.2:1.

In Neoplastic lesions benign tumours (69.33%) predominate over the malignant tumours(30.66%) as observed in the present study as well as in previous studies done by Ahmed et al[4] (86% benign and 14% malignant), Nagarkar et al[5] (75% and 25%) and Ito et al[6] (67.5% and 32.5%).

From age wise distribution of neoplastic lesions, it was observed that benign lesion is seen in lower age group (Mean age 36.14 year) than malignant lesion (Mean age 50.43year). This was in contrast to the series reported by Thomas et al[7] (Benign-39 year and Malignant-47year), Ahmed et al[4] (35.7 year and 42.4 year) and Edda et al[8] (33.5 year and 43 year).

In the present study there is a male preponderance (M:F ratio of 3.6:1) in malignant tumours as in most of the studies by Ahmed et al[4] (M:F ratio 1.1:1), Mohd Ayub et al[9] (M:F ratio 2.25:1), and Iqbal MS et al[10] (M:F ratio 2:1), but female predominance in benign tumour (M:F ratio 1:1.36), which correlates with Edda et al[8] (M:F ratio 1:1.4), Mohd Ayub et al[9] (M:F ratio 1:1.98), and Iqbal MS et al[10] (M:F ratio 1:1.53).

In our study parotid gland was the commonest site of neoplasia (73.34%) followed by submandibular gland (20%) and Minor salivary gland (6.66%) which is accordant to other studies by Ahmed et al[4], Pablo et al[11], Rewusuwan et al[12] and Bashir S et al[13]**.**

Pleomorphic adenoma was the most common tumour accounting for 57.33 % of all tumours and 82% of all benign tumours. This correlates to the results of other series by Pablo et al[11] (67% of total tumour and 84% of total benign tumour), Nagarkar et al[5] (52.77% of total tumour and 84.30% of total benign tumour) and Bashir S et al[13] (55% of total tumour and 89% of total benign tumour)

The peak age incidence of pleomorphic adenoma was 20-49 years with a female preponderance with the Male female ratio of 1:1.5. These findings are similar to other

series of Thomas et al[7] (Peak age 30-50 years and M: F ratio of 1:1.1), Rewusuwan et al[12] (14-79 years and 1:2) and Mohd Ayub et al[9] (30-50 years and 1:1.1)

In present study parotid gland is the most common site of pleomorphic adenoma (69.77%) and is consistent with other studies by Pablo et al[11] (69.05%), Rewusuwan et al[12] (79.27%) and Bashir S et al[13] (72.72%).

Warthin's tumour constitutes 6.66% of all tumours and 9.61 of all benign tumour results of which correlates with that of Pablo et al[11] (10.48 % of all tumours and 13% of all benign tumours) and Mohd Ayub et al[9] (5.88% of all tumours and 7.9% of all benign tumours).

Age incidence of Warthin's tumour was seen in between 40-60 years with M:F ratio of 1.5:1 which correlates with that of Rewusuwan et al[12] (Peak age 40-60 year and M:F ratio 2.1:1) and Ito et al (Peak age 40- 70 year with M:F ratio 2:1).

All the cases of Warthin's tumour were limited to parotid gland (100%) which correlates with other studies by Mohd Ayub et al[9], Ito et al[6] and Bashir et al[13].

Two cases of myoepithelioma, accounting for 2.66 % of all tumours seen in 43 and 50 year old female in parotid and minor salivary gland. These cases were positive for IHC markers CK, CK7 and Calponin which is similar to studies done by Kapoor et al[14]

In the study one case of Oxyphilic adenoma found comprising 1.33% of all tumours in 25 year old female in parotid gland correlating to studies by Bashir et al[13] (1.25%), Ito et al[6] (0.6%) and Edda et al[8] (2.8%) with a predominance in the parotid gland.

One case of Solitary fibrous tumour was seen in 18 year old female in the parotid gland accounting 1.33% of all tumours. As this case was diagnosed as intermediate grade but we were including tumours in benign and malignant category according to WHO classification, so we included this case in benign category. This case was positive for CD34 and vimentin on IHC which is similar to study did by O. Chis et al[15.]

Among malignant neoplastic lesion Mucoepidermoid carcinoma was most common lesion comprised of 10.66% of all tumours and 34.78% of malignant tumours. This was Similar to the observation of series by Thomas et al[7] (6.84% of all tumours and 34.73% of malignant tumours) and Iqbal MS et al[10] (11.32% of all tumours and 40% of malignant tumours).

The peak incidence of Mucoepidermoid carcinoma was seen in the higher age group 60 to 80 years with male predominance (M:F ratio of 3:1) which correlates to studies of Iqbal et al[10] (Peak age 40 to 70 years with M:F ratio of 2:1).

In our study parotid gland was the most common site (75%) for mucoepidermoid carcinoma with equal incidence in submandibular gland and minor salivary gland (15.38%) which correlates with the study of Thomas et al[7] (Involvement of Parotid gland 69.23% , Submandibular gland 15.38% and Minor salivary gland 15.38%). In other series of Pablo et al[11] and Bashir S et al[13] where the incidence was high in parotid gland followed by in minor salivary gland and submandibular gland.

In this study 5 cases of Adenoid cystic carcinoma found accounting for 6.66 % of all tumours and 21.73 % of malignant tumours with peaks incidence in 30-59 years which correlate to studies of Nagarkar et al[5] (5.55% of all tumour and 25% of all malignant tumours) and Ito et al[6] (7.9% of all tumours, 24.2% of all malignant tumours).

In most of the studies there is female preponderance and in the present study, there is male predominance with M:F ratio of 4:1. In few studies, there is male predominance as of Thomas et al[7] (1.33:1) and Gurney TA et al[16] (1.36:1)

In the study adenoid cystic carcinoma distributed equally in the parotid gland (40%) and minor salivary glands (40%) more common than submandibular gland (20%) which correlates with the study of Rewusuwan et al[12].

In the present study 3 cases of Adenocarcinoma (Not otherwise specified) were seen comprising of 4% of all tumours and 13.04% of malignant tumours with peak age incidence of 40 to 60 year in males located in the parotid gland which correlates with the study of edda et al[8] and Shrestha et al[17.]

One case of Acinic cell carcinoma was seen accounting for 1.33 % of all tumours and 4.34 % of malignant tumours, seen in a 42 year old male located in the parotid gland which correlates with series of Iqbal MS et al[10] and Ito et al[6.]

Two cases of Carcinoma ex - pleomorphic adenoma were seen comprising 2.66 % of all tumours and 8.69 % of malignant tumours in 26 and 50 year old female located in the parotid gland which similar to studies by Mohd Ayub et al[9] and Pablo et al[11]. In this case, there was a high Ki67 proliferative index (40%) which is similar to study done by Fernanda et al[18].

One case of Carcinosarcoma found in 48 year old male patient in parotid gland comprising 1.33 % of all tumour with CK and vimentin positive on IHC, which correlates with the study of Pang et al[19].

One case of primary neuroendocrine Small cell carcinoma found in 63 year old male in parotid gland comprising 1.33 % of all tumours. This case was positive for CK and Chromogranin and negative for P63, Calponin and LCA which is similar to study done by Liu M et al[20].

In our study one case of B- cell Non hodgkin's lymphoma found in the 60 year old male patient in submandibular gland comprising 1.33 % of all tumours. This case was positive for CD 20 and negative for CD3, CD5 and Cyclin D1 which is similar to study done by Metikurke SH et al[21].

One case of Squamous cell carcinoma was noted in an 82 year old male patient in parotid gland accounting for

1.33 % of all tumours and 4.34 % of malignant tumours. Similar incidence found in Edda et al (1.5% of all tumour and 3.25% of malignant tumours seen in the parotid gland in 75% cases), Bashir et al (2.5% of all tumours and 6.45% of malignant tumour seen in the parotid gland in 50% cases) and Shrestha s et al (2,8% of all tumours and 3.64% of malignant tumours) with high age group.

CONCLUSION

In this study, the findings were more or less similar to those in the previous literature. As we found limited varieties in non-neoplastic lesions where as in neoplastic lesions we, fortunately, found some rare cases of the salivary gland which is showing the diversity of salivary gland lesions.

It is evident that association of histopathological examination and other techniques like IHC is the important method in establishing the final diagnosis, typing, grading and predicting prognosis of neoplasm.

RECOMMENDATIONS

As there is a difference in epidemiological data in different published literature and also there are a limited number of published workup on rare tumours of the salivary glands as we found in our study. So that further more population-based surveys are needed to define the epidemiology of salivary gland neoplasm.

LIMITATIONS

Salivary gland tumors not uncommonly pose problems in diagnosis because of their rarity, broad morphologic spectrum, and morphologic overlap among the different tumor types. Also, there are limited, but important, role of IHC to support the histological interpretations of salivary gland tumors and the result obtained by IHC may be exceptional and unexpected.

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