

## A Histopathological Study of Salivary Gland Lesions

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**Abstract:** Lesions of the salivary glands present an interesting subject matter because of their great histologic diversification. This study was carried out to study the histopathological spectrum of salivary gland lesions and to know their pattern of distribution. The study was done with retrospective data from August 2012 to September 2014 and in the department of Pathology Siddhartha Medical College, Vijayawada. Out of total 53 cases, 41(77.35%) were neoplastic and 12(22.64%) were non neoplastic. Predominance of females was observed with M: F ratio of 0.8:1. The mean age observed was 46.7 years with age range of 12 to 75 years. Benign tumors outnumbered the malignant ones. Parotid was the most common site for the location of tumors (73.5%) and Pleomorphic adenoma was the commonest salivary gland tumor observed in both sexes. Muco-epidermoid carcinoma was the most common among the malignant salivary gland tumors followed by adenoid cystic carcinoma. Owing to the complex features exhibited by salivary gland lesions histopathological examination is the mainstay for diagnosis and categorization.

**Keywords:** Histopathology, Salivary gland, Pleomorphic adenoma, Mucoepidermoid carcinoma.

### I. Introduction

Salivary gland lesions are not so common, especially neoplasms, which constitute less than 1% of all tumors and about 4 percent of all epithelial neoplasms encountered in the head and neck region [1]. These comprise a wide variety of benign and malignant neoplasms, non-neoplastic lesions which exhibit difference not only in biological behavior but in prognosis as well. Tumours of salivary gland have continuously interested medical profession, pathologists in particular because of a number of peculiarities of the subject. Approximately 80% of the salivary gland tumors are found in the Parotid gland and 10 to 15% in the submandibular gland. Majority of Salivary gland tumours are of benign histology (80-85%), with pleomorphic adenoma being the most common, (2) constituting 70% of benign tumours. The probability of malignancy is relatively inversely proportional to the size of the gland. Overall, benign tumours of the salivary glands tend to present somewhat earlier than malignant ones. The etiology, prognostic factors and risk factors are poorly defined. Many of these lesions behave in an indolent fashion and some of the histologic types tend to recur late. Thus there is a call for follow up to improve the ability of the clinician to draw conclusion about the efficacy of treatment. Due to a lack of long term follow up, screening and registration, risk factors and prevention are poorly known [2]. A diagnosis of salivary gland neoplasm must be considered in any patient who presents with a mass in the parotid or submandibular region or a sub mucosal mass in the oral cavity or pharynx. A preoperative sonography combined with FNAC, CT scan and MRI in some cases provides necessary clues prior to surgery [1]. Although FNAC is a tool for pre-operative evaluation, Histopathology still remains the gold standard in giving the final diagnosis.

### I. Aim And Objectives

1. To study the morphological appearances of salivary gland lesions.
2. To observe the prevalence of salivary gland lesions.
3. To evaluate the incidence, age at occurrence, sex ratio among the patients with salivary lesions who attended Government general hospital, Vijayawada.
4. To compare and observe the results of this study with other studies in the contemporary literature.

### II. Materials And Methods

#### Type of study:

A retrospective and cross sectional study to study the histopathological changes of biopsies of lesions of salivary glands that were conducted in Department of Pathology, Siddhartha medical college, Vijayawada from August 2012 to September 2014.

#### Source of data:

The present study titled "A Histopathological study of salivary gland lesions" was conducted in the Department of Pathology, Siddhartha medical college, Vijayawada from 1st August 2012 to September 30th 2014. The source of data is from the biopsies of lesions of salivary glands that were received at Department of Pathology through The Government General hospital, Vijayawada. A total of 53 cases were studied.

**Sample size:**

The study comprised of 53 cases that were received during the period August 2012 to October 2014.

**Methods of collection of data:**

The study was made according to the pre designed proforma. A brief history was taken and a thorough clinical examination including general, systemic and local examination was done. The history and other details of clinical examination of the salivary glands was done and sent for histopathological examination. The biopsies were carefully labeled, subjected to processing and stained with H&E.

**Inclusion criteria:**

1. Non neoplastic disorders of major and minor salivary glands.
2. Benign lesions of major and minor salivary glands.
3. Malignant lesions of major and minor salivary glands.

**Exclusion criteria:**

1. Inadequate and improperly fixed tissue biopsies.

**III. Results / Observations**

The present study includes all the cases of salivary gland lesions that are reported in the Dept. of Pathology, Siddhartha Medical College Vijayawada over a period of two years that is from August 2012 to September 2014. This study includes a total of 53 cases.

**Table 1: Showing Site Of Lesion**

Maximum number of cases are seen in Parotid gland constituting 39 cases (73.5%) followed by Submandibular gland constituting 9 cases (16.9%).

	Parotid Gland	Submandibular Gland	Minor salivary Gland	Total
<b>Total</b>	39	9	5	53
<b>Percentage</b>	73.5	16.9	9.4	

**Table 2: Age And Sex Incidence**

Maximum number of cases are seen in 41-50 year age group (24.52%) followed by 31-40 year age group (16.98%) and 61-70 years age group (16.98%).

	No: Of Cases	Percentage
<b>Male</b>	24	45.28
<b>Female</b>	29	54.71
<b>Total</b>	53	

The above table shows female preponderance with M: F Ratio - 0.8:1.

**Table 3: Nature Of Salivary Gland Lesions**

Maximum numbers of salivary lesions are neoplasms - 41 cases (77.35%)

	Nonneoplastic	Neoplastic	Total
<b>No: Of Cases</b>	12	41	53
<b>Percentage</b>	22.64	77.35	

**Table 4: Incidence Of Salivary Neoplasms**

Maximum numbers of salivary neoplasms are benign neoplasms - 31 cases (75.61%).

	No: Of Cases	Percentage
<b>Benign</b>	31	75.61
<b>Malignant</b>	10	24.39
<b>Total</b>	41	

**Table 5: Morphological Spectrum Of Lesions**

Pleomorphic adenoma constitutes the most common lesion with 24 cases (45.28%) followed by cystic lesion - 9 cases (16.98%).

Lesion	No Of Cases	Percentage
<b>Cysts</b>	9	16.98
<b>Sialadenitis</b>	3	5.66

<b>Pleomorphic adenoma</b>	24	45.28
<b>Monomorphic adenoma</b>	3	5.66
<b>Myoepithelioma</b>	1	1.88
<b>Warthin's</b>	3	5.66
<b>Mucoepidermoid carcinoma</b>	5	9.43
<b>Adenoid cystic carcinoma</b>	2	3.77
<b>Salivary Duct carcinoma</b>	1	1.88
<b>Carcinoma- ex Pleomorphic</b>	1	1.88
<b>Poorly differentiated carcinoma</b>	1	1.88
<b>TOTAL</b>	53	100

**Table 8: Morphological Spectrum Of Benign Neoplasms**

Lesion	Number	Percentage
<b>Pleomorphic adenoma</b>	24	77.41
<b>Monomorphic adenoma</b>	3	9.67
<b>Warthin's</b>	3	9.67
<b>Myoepithelioma</b>	1	3.22
<b>TOTAL</b>	31	

**Table 9: Morphological Spectrum Of Malignant Neoplasms**

Out of the total 10 malignant neoplasms, maximum cases are Muco-epidermoid carcinoma-5 cases (50%) followed by Adenoid cystic carcinoma 2 cases (20%).

Lesion	Number	Percentage
<b>Mucoepidermoid carcinoma</b>	5	50
<b>Adenoid cystic carcinoma</b>	2	20
<b>Salivary duct carcinoma</b>	1	10
<b>Carcinoma ex pleomorphic adenoma</b>	1	10
<b>Poorly differentiated carcinoma</b>	1	10
<b>TOTAL</b>	10	

**Table – 10: Site Wise Distribution Of Salivary Lesions**

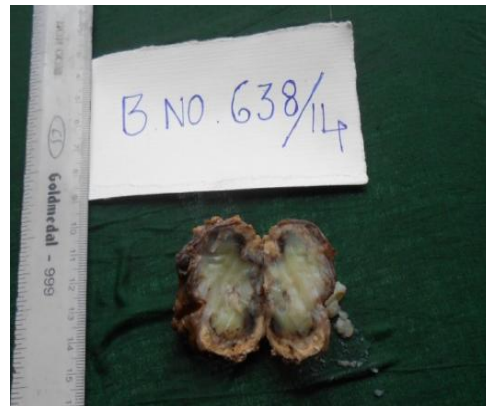
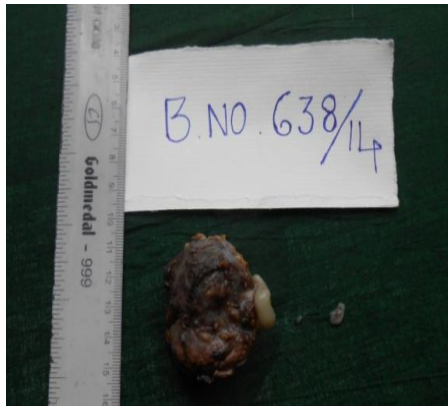
Majority of cases are seen in the Parotid gland -39 cases, of which pleomorphic adenoma constitute the maximum number of cases in parotid gland-28 cases (71.79%) followed by mucoepidermoid carcinoma 5 cases (12.82%).

Lesion	Parotid	Submandibular	Minor	Total
Cysts	3(5.66%)	1(1.88%)	5 (9.43%)	9 (16.9%)
Sialadenitis	-	3(5.66%)	-	3(5.66%)
Pleomorphic adenoma	28(52.83%)	5(9.43%)	1(1.88%)	34(45.28%)
Monomorphic adenoma	3(5.66%)	-	-	3(5.66%)
Myoepithelioma	1(1.88%)	-	-	1(1.88%)
Warthin's	3(5.66%)	-	-	3(5.66%)
Mucoepidermoid	5(9.43%)	-	-	5(9.43%)
Adenoid cystic	1(1.88%)	-	1(1.88%)	2(3.77%)
Salivary duct carcinoma	1(1.88%)	-	-	1(1.88%)
Carcinoma ex pleomorphic adenoma	1(1.88%)	-	-	1(1.88%)
Poorly differentiated	1(1.88%)	-	-	1(1.88%)
<b>TOTAL</b>	39	9	5	53

**Gross Pictures**



Basal Cell Adenoma: Gross And Cut Section

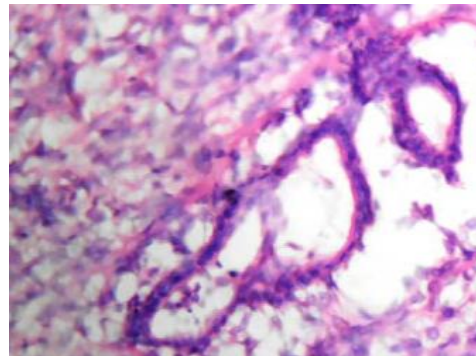
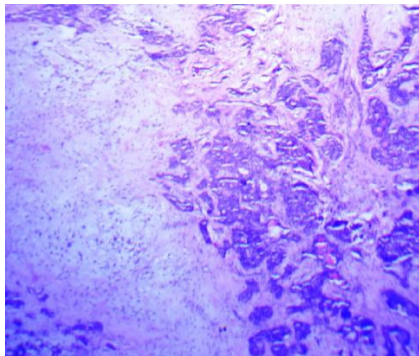


Muco Epidermoid Carcinoma: Gross And Cut Section

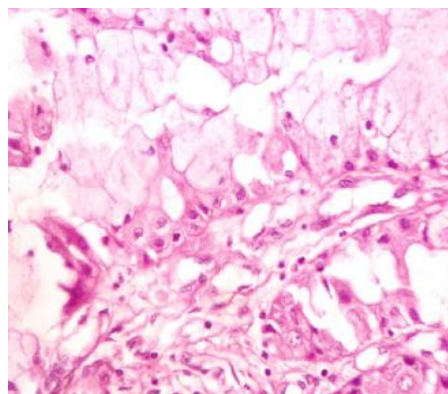
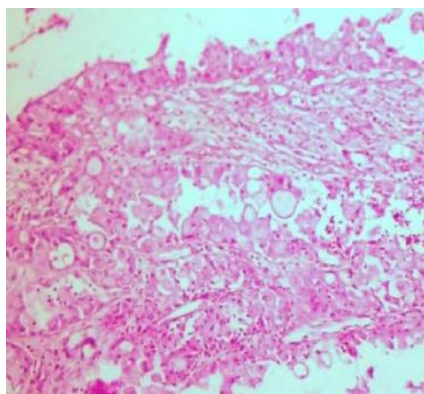


Salivary Duct Carcinoma

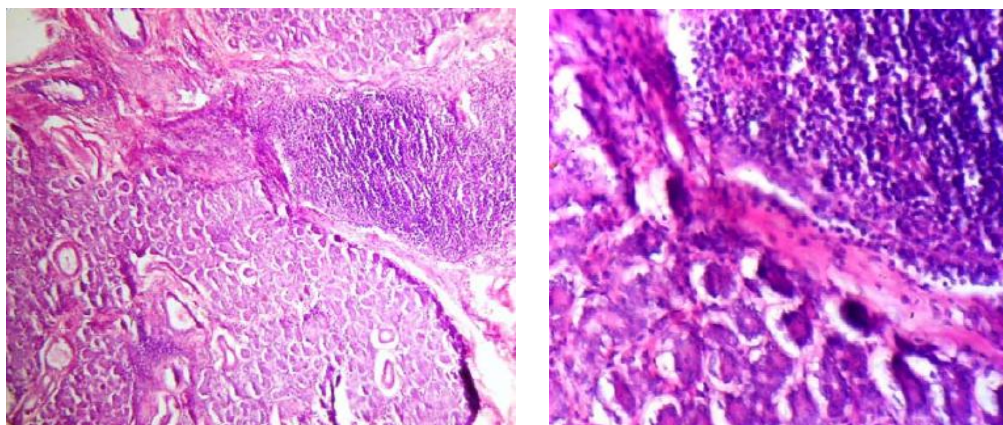
**Microscopy**



Pleomorphic Adenoma: Showing Tubular Structures And Myxoid Stroma (Lp) And Glands In Myxoid Stroma (Hp)



Mucoepidermoid Carcinoma: Showing Squamous And Mucinous Components (Lp), Showing Mucinous Components (Hp)



Chronic Sialadenitis showing Glands And Lymphoplasmacytic Infiltrate

#### IV. Discussion

The salivary gland disorders represent a distinct group of disorders affecting both the major and minor glands. These conditions range from inflammatory disorders of infectious, granulomatous, auto immune etiology to obstructive, developmental, idiopathic disorders and neoplasm.

Among the salivary lesions studied, maximum cases were neoplasms - 41 cases (77.35%) and the non-neoplastic cases were 12 (22.64%). Among the neoplasms studied, 31(75.61%) cases were benign and 10 (24.39%) were malignant. This observation was comparable to most of the studies including case series by Nepal et al [3], Ali N Set al. [5], and Moghadam SA et al. [4] where they noted a predominance of benign tumors over the malignant ones. The Table 11 shows that majority of the lesions were benign neoplasms and is similar to the other studies in literature.

Among the neoplastic lesions, maximum incidence was seen with benign neoplasms. Among the neoplasms, pleomorphic adenoma was frequently seen followed by Warthin's and monomorphic adenoma. Muco-epidermoid carcinoma was the most common malignancy studied.

	Shrestha S et al, (2014) <sup>[6]</sup>	Bashir S et al, (2013) <sup>[7]</sup>	Naeem Sultan Ali (2011) <sup>[5]</sup>	Present study
<b>Benign</b>	62.5%	61.5%	73.21%	75.61%
<b>Malignant</b>	37.5%	38.75%	26.78%	24.39%

In this study of 53 lesions, among the neoplastic lesions pleomorphic adenoma was the commonest while among non-neoplastic lesions commonest were cysts. Out of 12 non neoplastic cases there were 9 cystic lesions (75%) & 3 inflammatory lesions (25%). Majority of cystic lesions occurred in parotid gland. Among the cysts in the minor salivary glands, mucus retention cysts were common. Benign salivary gland tumors were more common in age group of 41 to 50 years with a mean age of 43.63 years. The youngest age of occurrence of benign salivary neoplasms was 12 years and the oldest age observed was 75 years. Both the cases were Pleomorphic adenomas. The peak age incidence observed for malignant salivary gland tumours was 61 to 70 years. The mean age for malignant tumours is 52.7 years. The youngest age for the occurrence of malignancy observed in the present study was 33 years and the oldest age observed was 70 years.

**Table 12:** Showing Comparison Of Age Incidence Of Salivary lesions

Age	Shrestha S et al. (2014) <sup>[6]</sup>	Bashir. S. et al (2013) <sup>[7]</sup>	Present study
<b>0-10y</b>	0	0	0
<b>11-20y</b>	5.68	6.25	15.09
<b>21-30y</b>	12.5	16.25	13.20
<b>31-40y</b>	21.59	12.5	16.98
<b>41-50y</b>	26.13	22.5	24.52
<b>51-60y</b>	12.5	27.5	11.32
<b>61-70y</b>	13.63	15	16.98
<b>71-80y</b>	7.95	0	1.88
<b>Total</b>	100	100	100

Shrestha S et al. (2014)<sup>[6]</sup> Have done a retrospective study of 176 cases of salivary gland tumors at B.P.Koirala Memorial Cancer Hospital, Nepal. The mean age observed was 44.76 years with age range of 12 to 75 years. Pleomorphic adenoma was found to be the commonest benign tumor (72.7 %), followed by Warthin tumor (15.1%), monomorphic adenoma (3.0 %) and basal cell adenoma (3.0 %). Dr. Shazia Bashir et al conducted a combination study was done with retrospective data of eight years and prospective data of two

years. Out of total 80 cases, 49 (61.25%) were benign and 31 (38.75%) were malignant. Predominance of males was observed with M: F ratio of 2.3:1. The mean age observed was 44.76 years with age range of 12 to 75 years. Benign tumors outnumbered the malignant ones. Parotid was the most common site for the location of tumors (65%) followed by submandibular (25%) and minor salivary glands (10%). Pleomorphic adenoma was the commonest salivary gland tumor observed in both sexes. Mucoepidermoid carcinoma was the most common among the malignant salivary gland tumors followed by adenoid cystic carcinoma. The sex incidence varied with respect to different lesions of the salivary glands. In the present study there were 24 males (45.28%) and 29 females (54.71%), with a Male:Female ratio of 0.8:1. Dandapat et al.<sup>[8]</sup> and Rewsuwan et al.<sup>[9]</sup> also reported a female preponderance in their series. Parotid was the commonest site of lesion (73.5%) in this series followed by submandibular gland (16.9%) and minor salivary glands (9.4%). This is in conformity with other workers, viz., Gore et al.<sup>[10]</sup>, Richardson et al [90] and Dandapat et al<sup>[8]</sup>. Among the lesions of parotid gland majority were benign tumors (66.03%). Pleomorphic adenoma was the most common lesion with 28 cases (52.83%).

**Table 13:** Comparison Of Site Of Salivary Lesions

	Bashir, S. et al (2013) <sup>[7]</sup>	Erik G. Cohen et al (2004) <sup>[15]</sup>	T.Chatterjee et al (2000) <sup>[13]</sup>	Present study
<b>Parotid gland</b>	65.30%	74	77	73.5
<b>Submandibular gland</b>	20.40	26	9	16.9
<b>Minor gland</b>	4.08	-	14	9.4

The above table shows that Parotid gland is the frequent site in the present series among the salivary glands to have lesions as compared to the similar studies in literature. T. Chatterjee et al conducted a retrospective study for 23 years and 315 salivary gland specimens were received. There were 192 (61%) benign neoplasms and 123 (39%) malignancies. Among the benign ones, Pleomorphic adenoma was common and among malignancies, Adenoid cystic carcinoma was common. Parotid gland is the frequent site followed by Submandibular gland. Maximum Benign cases were seen in the third decade and malignancies in the 5th decade. Out of 53 cases studied there were 24 cases of pleomorphic adenoma, 9 cases were of cysts, 5 cases were mucoepidermoid carcinoma, 3 cases were monomorphic adenoma and warthin's tumour, 2 cases of Adenoid cystic carcinoma. There was 1 case each of myoepithelioma, salivary duct carcinoma, poorly differentiated carcinoma, carcinoma ex Pleomorphic adenoma. Out of 9 cysts received 3 cases were seen in the parotid gland, 1 case was in the submandibular gland, and 5 cases were in the minor salivary gland. Most of the cysts were of mucus retention type and mostly occurred in the minor salivary glands. Those in the major salivary glands were salivary duct cysts and retention cysts. In the present study, mean age for the occurrence of cysts was 41.1 years with age range of 12 to 70 years. There were 41 cases of salivary tumors, out of which 31 cases were benign tumors and 10 cases were malignant tumors.

Table 13 shows that pleomorphic adenoma is the most frequently encountered neoplasm of the salivary glands in the present study and is comparable to the similar studies by Sreshta et al, Erik G. Cohen et al, Naeem Sultan Ali. According to Foote and Frazell (1954)<sup>[12]</sup> and G.G.Potdar,<sup>[13]</sup> 65 to 75 % of the tumours are pleomorphic adenomas. 24 cases (45.28%) encountered in parotid, submandibular and minor salivary glands. Most of these cases occurred in the parotid gland (82.35%). Potdar and Paymaster<sup>[13]</sup> reported 183 cases of pleomorphic adenomas, out of which 101 were involving parotid gland. In the present study, mean age for pleomorphic adenoma was 43.53. In the present study, mean age for pleomorphic adenoma was 43.53 years with age range of 13 to 75 years. Out of all reported cases of pleomorphic adenoma, 32 were males and 12 were females with a male to female ratio of 2.6:1. There were 10 cases of malignant salivary neoplasms, of which 5 were Mucoepidermoid carcinoma, 2 were Adenoid cystic carcinoma, 1 case each of Salivary duct carcinoma, Poorly differentiated carcinoma, carcinoma ex Pleomorphic adenoma. Mucoepidermoid carcinoma was the most common malignant salivary gland tumor occurring in the salivary glands constituting 5 (50%) of all malignant salivary gland tumors in the present study. Mucoepidermoid carcinoma was reported to be the most common malignant salivary gland tumor of parotid by Richardson et al<sup>[11]</sup> and Ali et al<sup>[5]</sup>. There were 2 cases of Adenoid cystic carcinoma. It is the second most common malignancy of the salivary glands in the present study. It was also reported to be the second most common malignant salivary gland tumour in the series reported by Vergas et al<sup>[14]</sup>. In contrast to the present study, Lima et al and Rewsuwan et al<sup>[9]</sup> reported adenoid cystic carcinoma to be the most common malignant salivary gland tumor in their series. 1 case each was seen in the Parotid and in the minor salivary glands. It is the only malignancy which is reported in the minor salivary glands in the present study.

## V. Summary & Conclusion

The Present study is a prospective study of lesions of salivary glands carried out in the Department of Pathology, Siddhartha Medical College, Vijayawada, of the cases that attended to Government General Hospital, Vijayawada from August 2012 to September 2014. The approach was to study the various

histopathological types of salivary gland lesions, their classification and thorough study of lesions of salivary glands and to compare the observed findings to similar studies in relation to incidence, age, sex and risk factor distribution. Following observations are noted.

1. During the specified period, total of 53 cases of salivary gland lesions were studied.
2. Mean age observed was 46.7 years with an age range of 12 to 75 years.
3. There were 24 males (45.28%) and 29 females (54.71%), with a male:female ratio of 0.8:1.
4. Parotid was the commonest site of lesion (73.5%)
5. Maximum cases were neoplasms - 41 cases (77.35%) and the non-neoplastic cases were 12 (22.64%).
6. Majority of cases among non-neoplastic lesions were cysts,
7. Among the neoplasms studied, 31 (75.61%) cases were benign and 10 (24.39%) were malignant.
8. Pleomorphic adenoma was the most frequent histological type of benign neoplasm.

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