

A Hospital-Based Study to Assess the Occurrence, Distribution and Histo-Morphological Aspect of Various Salivary Gland Lesions**Manish Kumar Jha¹, Madhu Bharti², Md. Imteyaz Alam³, Poonam Kumari⁴**¹Tutor, Department of Pathology, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India²Tutor, Department of Pathology, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India³Tutor, Department of Pathology, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India⁴Associate Professor and HOD, Department of Pathology, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India

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Conflict of interest: Nil

Abstract**Aim:** The objective of this study was to assess the occurrence, distribution and histo-morphological aspect of various salivary gland lesions.**Material & Methods:** This was an observational, single institutional study and materials required for the study were collected from the Department of Pathology, The surgically resected salivary gland specimens between the period of one year. The study procedure was in accordance with the principles of the Declaration of Helsinki. A total of 50 specimens of salivary gland lesions were analyzed, this study included both the non-neoplastic and neoplastic lesions of the salivary gland.**Results:** According to that the commonest tumor was pleomorphic adenoma which accounted for 66% (33) of all cases followed by mucoepidermoid carcinoma, accounting for 14% (7) of all cases. And the least common tumors were cavernous haemangioma (2%), adeno cystic carcinoma (4%) and SCC (2%). In present study the distribution of all cases according to age shows that 40 – 49 years of age was the commonest age group with 30% (15) of total cases were from this group followed by 30 – 39 years of age [28% (14)]. The Warthin tumors were commonly seen in 60 – 69 years of age. Also the frequency of malignant tumors was high after 40 years of age. Gender wise incidence of salivary gland tumors in males was 48% and in female was 52%. Among benign tumours, female preponderance was seen in pleomorphic adenoma. Among malignant tumours mucoepidermoid carcinoma showed a female preponderance. Parotid was commonest salivary gland involved with 74% of all tumors, followed by submandibular with 24% and minor salivary glands with 1 (2%) of salivary gland tumors.**Conclusion:** This study observed that parotid is most common site for the SGT. And pleomorphic adenoma and the Warthin tumors are the common benign tumors involve parotid gland the most. Among malignant tumors mucoepidermoid carcinoma are the commonest with female preponderance. While other carcinoma like adenoid cystic carcinoma and SCC are also common.**Keywords:** Salivary Gland, Benign Tumors, Malignant Tumors.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Salivary glands are important structures which secrete saliva, that take part in food digestion process. Saliva, apart from carrying some digestive enzymes, also has concentration of antibodies that participate in the body's defense system. The constant flow of saliva in the mouth reduces the accumulation of bacteria on intra oral structures, therefore reducing the chances of infection. Its lubrication effect makes speech and mastication easy and comfortable. [1]

Salivary gland neoplasms are rare lesions and represent less than 1% of all tumors and 3-5.5% of all head and neck tumors. [2,3] Salivary gland tumors (SGTs) are rare and their annual incidence

is <1/100,000 inhabitants, without noticeable geographical gap, and they represent <5% of head and neck tumors [4] There is a male predominance and a peak incidence in the third

decade of life. [5] The spectrum of salivary gland lesions is wide and the relative incidence of neoplastic versus non neoplastic lesions is variable in different studies. 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, constituting 70% of

benign tumours. [6] Salivary gland tumors are 12 times more frequent in parotid gland than in submandibular gland. The majority are benign and largely represented by pleomorphic adenoma. [7,8] Parotid gland accounts for nearly 80% of the salivary gland tumors followed by the submandibular gland accounting for approximately 10-15% of the tumors. 80-85% of the tumors are benign in nature with Pleomorphic adenoma being the most common tumor constituting 70% of benign tumours [9] followed by Warthin tumor. [10]

The most common malignant salivary gland tumour is the Mucoepidermoid carcinoma which involves mostly the parotid gland followed by the minor and submandibular gland. [11] Adenoid cystic carcinoma (originally known as cylindroma) is a generally slow growing but highly malignant neoplasm with a remarkable capacity for recurrence. In the parotid gland it is less common than the mucoepidermoid carcinoma and acinic cell carcinoma, but in the minor salivary glands it is the most common malignant tumour. [12] Acinic cell carcinoma comprises of 1-3 % of all salivary gland tumour. Although fine needle aspiration cytology (FNAC) is a tool for pre-operative evaluation, histopathology still remains the gold standard in giving the final diagnosis. [13]

Hence the aim of study was to assess the age, sex and site distribution of various salivary gland lesions and to study the spectrum of histomorphological features of various salivary gland lesions in correlation with the clinical diagnosis at a tertiary care center.

Material & Methods

This was an observational, single institutional study and materials required for the study were collected from the Department of Pathology, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India. The surgically resected salivary gland specimens between the period of one year and study procedure was in accordance with the

principles of the Declaration of Helsinki. A total of 50 specimens of salivary gland lesions were analyzed, this study includes both the non-neoplastic and neoplastic lesions of the salivary gland. The specimens consisted of open biopsies, superficial parotidectomies and total parotidectomies with or without resection of the draining lymph nodes.

Methodology

In the retrospective part of the study history and clinical details were collected from the biopsy register, the blocks and slides were retrieved and studied. In the prospective part of the study patient's history and clinical details were noted from the original request forms, specimens were fixed in formalin and sections were processed and embedded in paraffin after the gross examination. The sections were taken from the lesion, its margins, surrounding tissues and lymph nodes if any. The paraffin blocks were serially cut to get sections of 3-5 μ m thickness. These sections were stained with hematoxylin and eosin stains, and in selected cases special stain like PAS was done.

These slides were examined under low power and high-power magnification. The details of cellular architecture, encapsulation, perineural and vascular patterns and surrounding areas were studied. The tumors were classified according to World Health Organization's (WHO) histologic typing of salivary gland tumors.

Statistical Analysis

Data acquired from examination of each specimen were tabulated using a proforma in a systematic sequence. The data obtained were then processed using the Statistical package for social sciences (SPSS) software version 20. The processed data were then analyzed and the results obtained were compared with the existing studies in literature.

Results

Table 1: Distribution of all salivary gland tumors according to their morphological types

Types of Lesions	Total No of Cases	Percentage
Pleomorphic Adenoma	33	66
Warthin Tumor	5	10
Basal Cell Adenoma	1	2
Mucoepidermoid Carcinoma	7	14
Adenoid Cystic Carcinoma	2	4
SCC	1	2
Cavernous Haemangioma	1	2
Total	50	100%

According to that the commonest tumor was pleomorphic adenoma which accounted for 66% (33) of all cases followed by mucoepidermoid carcinoma, accounting for 14% (7) of all cases. And the least common tumors were cavernous haemangioma (2%), adeno cystic carcinoma (4%) and SCC (2%).

Table 2: Age wise distribution of all salivary gland tumors

Tumours	Age in year								Total
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	
Pleomorphic Adenoma	0	04	06	11	10	00	02	0	33
Warthin Tumor	0	0	0	0	02	0	02	01	5
Basal Cell Adenoma	0	0	0	0	0	0	02	0	1
Mucoepidermoid Carcinoma	0	0	01	03	02	01	0	0	7
Adenoid Cystic Carcinoma	0	0	0	0	0	01	01	0	2
SCC	0	0	0	0	1	0	0	0	1
Cavernous Haemangioma	0	0	1	0	0	0	0	0	1
Total	0	4	7	14	15	2	7	1	50

In present study the distribution of all cases according to age shows that 40 – 49 years of age was the commonest age group with 30% (15) of total cases were from this group followed by 30 – 39 years of age [28% (14)]. The Warthin tumors were commonly seen in 60 – 69 years of age. Also the frequency of malignant tumors was high after 40 years of age.

Table 3: Gender wise distribution of all salivary gland tumours

Tumour	Male	Female	Total
Benign			
1.Pleomorphic Adenoma	15	18	33
2.Warthin Tumor	0	5	5
3. Basal Cell Adenoma	1	0	1
4.Cavernous Haemangioma	0	1	1
Total	16	24	40
Malignant			
1. Mucoepidermoid Carcinoma	5	2	7
2. Adenoid Cystic Carcinoma	2	0	2
3.SCC	1	0	1
Total	8	2	10
Grand total	24 (58%)	26 (52%)	50

Gender wise incidence of salivary gland tumors in males was 48% and in female was 52%. Among benign tumours, female preponderance was seen in pleomorphic adenoma. Among malignant tumours mucoepidermoid carcinoma showed a female preponderance.

Table 4: Site wise distribution of all salivary gland tumors

Tumors	Numbers	Parotid	Submandibular	Minor salivary
Pleomorphic Adenoma	33	23	10	0
Warthin Tumor	5	4	1	0
Basal Cell Adenoma	1	1	0	0
Mucoepidermoid Carcinoma	7	6	1	0
Adenoid Cystic Carcinoma	2	2	0	0
SCC	1	0	0	1
Cavernous Haemangioma	1	1	0	0
Total	50	37	12	1

Parotid was commonest salivary gland involved with 74% of all tumors, followed by submandibular with 24% and minor salivary glands with 1 (2%) of salivary gland tumors.

Discussion

Salivary gland tumors (SGTs) are rare comprising approximately 3% to 10% of neoplasm of head and neck region. [14] The worldwide annual incidence of SGT ranges from 0.4 to 13.5 cases per 100000 population. [15] Benign tumors observed in

third and fourth decade and malignant tumors fourth and fifth decades. In infants’ mesenchymal tumors like Hemangioma, lymphangioma, sialoblastoma, and salivary gland anlage tumor is most common. [16] Female are more commonly affected than men, except for warthin tumor and high grade carcinomas. Major salivary glands are involved more frequently and out of them parotid being the most common site of involvement, followed by submandibular, sublingual and minor salivary glands. [17] FNAC is not a substitute of histomorphology but it could guide us whether lesion is salivary or non salivary, benign or

malignant. Histochemical studies have only a limited role in diagnosis of SGT. e.g. diagnosis of high grade mucoepidermoid carcinoma by intracytoplasmic mucin, PAS-diastase in basal cell or myoepithelial cell neoplasm, PTAH stain in clear cell variant of oncocytoma.

According to that the commonest tumor was pleomorphic adenoma which accounted for 66% (33) of all cases followed by mucoepidermoid carcinoma, accounting for 14% (7) of all cases. And the least common tumors were cavernous haemangioma (2%), adeno cystic carcinoma (4%) and SCC (2%). In present study the distribution of all cases according to age shows that 40 – 49 years of age was the commonest age group with 30% (15) of total cases were from this group followed by 30 – 39 years of age 28% (14). The Warthin tumors were commonly seen in 60 – 69 years of age. Also the frequency of malignant tumors was high after 40 years of age which was comparable to other studies like Vargas et al and Shresha et al, in which average age for benign/malignant tumors were 47.7/ 48.8 years and 44.7/56.0 years respectively. [18,19] Gender wise incidence of salivary gland tumors in males was 48% and in female was 52%. Among benign tumours, female preponderance was seen in pleomorphic adenoma. Among malignant tumours mucoepidermoid carcinoma showed a female preponderance. Thus, the slight female predominance in the present study was in accordance with the study of Rajdeo et al (2015) [20], Stewart et al (2000). [21] However, some authors like Shrestha et al [19] and Rajesh et al [22] found male preponderance in their studies.

Parotid was commonest salivary gland involved with 74% of all tumors, followed by submandibular with 24% and minor salivary glands with 1 (2%) of salivary gland tumors. The findings are similar to other studies like Shrestha et al [19] and Vargas et al. [18] However study by Zohreh et al [23] had more incidence of tumor in minor salivary glands as compare to submandibular glands.

Conclusion

This study observed that parotid is most common site for the SGT. And pleomorphic adenoma and the Warthin tumors are the common benign tumors involve parotid gland the most. Among malignant tumors mucoepidermoid carcinoma are the commonest with female preponderance. While other carcinoma like adenoid cystic carcinoma and SCC are also common.

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