

A Clinico-pathological Study of Major Salivary Gland Tumours in a Tertiary Health Care Centre of West Bengal, India.

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ABSTRACT

Background: Tumours of the salivary glands are relatively uncommon and comprise 3% to 10% of all head and neck neoplasms. Early diagnosis of salivary gland tumours plays a pivotal role in their management.

Objectives: The study was conducted to find out the prevalence of different benign and malignant tumours of the major salivary glands, to assess their clinical profile, and to find out the correlation between their preoperative FNAC and postoperative histopathological reports.

Methods: The study was carried out over a period of 18 months. Total 50 patients of major salivary gland tumours were included. The specimens were sent for histopathological examination. The preoperative FNAC findings were compared with the histopathological reports.

Results: Out of the total 50 cases, 46 (92%) were benign and 4 (8%) were malignant. Majority of the patients (62%) were 31 to 60 years of age. Parotid tumours were the most common (80%) salivary gland tumours. Parotid tumours were more common in females (57.5%) whereas submandibular gland tumours were more common in males (60%). Pleomorphic adenoma was the most common (85%) of all the benign salivary gland tumours and mucoepidermoid carcinoma was the most common (50%) of all the malignant salivary gland tumours.

Conclusions:

A significant portion of the major salivary gland tumours are found to be malignant. Malignant tumours are more common in the parotid glands. Early diagnosis is the most important part in their management.

Key words:- parotid gland, pleomorphic adenoma, salivary gland tumours, submandibular gland.

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I. INTRODUCTION

Tumours of the salivary glands are relatively uncommon and comprise 3% to 10% of head and neck neoplasms^[1]. Major salivary glands comprise of parotid glands, submandibular salivary glands and sublingual salivary glands. Tumours of the salivary glands are not very frequent. FNAC is an effective method of diagnosing salivary gland tumours. Early diagnosis and treatment of salivary gland tumours play a pivotal role in their management. Genomic alterations and environmental factors play important roles in causing salivary gland neoplasms. Chromosomal rearrangements activate PLAG1 which is attributed to Pleomorphic Salivary Adenoma. PLAG1 and HMAG2 fusions are found in patients of both pleomorphic adenomas and carcinoma ex-pleomorphic adenomas^[2]. Exposure to ionizing radiations acts as a risk factor for development of salivary gland tumours. Radiation therapy of the head and neck possess a significant risk for the development of salivary gland tumours.

Nepal et al.^[3] in their study of 51 cases of salivary gland tumours observed that 16 (31.3%) were males and 35 (68.6%) were females. Out of the total 51 cases, 41 (81%) were benign and 10 (19%) were malignant. Parotid tumours outnumbered all other salivary gland tumours whereas pleomorphic adenoma was the commonest of all salivary gland tumours. In a clinico-pathological study of 59 salivary gland tumours, Bobati et al.^[4] found 43 cases as benign and 16 as malignant. Out of the total 59 cases, 35.6% were male and 64.4% were

females. Pleomorphic adenoma and adenoid cystic carcinoma were respectively the most common benign and malignant neoplasms noted in their study. Venkatesh et al.^[5] in their study of 59 patients with parotid gland tumours found a ratio of 3.5:1 between benign and malignant tumours. Slowly progressive parotid swelling was the common presenting symptom in their study. The most common benign tumour was pleomorphic adenoma and the most common malignant tumour was mucoepidermoid carcinoma. In a clinicopathological study of salivary gland neoplasms, Bommareddy et al.^[6] found that the most frequent age group was 41-50 years. Out of the total 52 cases, 32 were female and 20 were male. Majority of the patients (87%) presented with swelling only whereas 13% of the patients presented with swelling associated with pain. Parotid was the most commonly involved (90%) salivary gland in their study. In another study of 96 cases of salivary gland tumours done by Tejaswini et al.^[7], 61 (63.5%) were male and 35 (36.5%) were female, whereas 51 (53%) were benign and 45 (47%) were malignant. Age of the patients was between 10 and 80 years. Among the benign tumours, pleomorphic adenoma was the most common (74.5%) and among the malignant tumours, mucoepidermoid carcinoma was the most common (49%). Gautam et al.^[8] in their study of 102 cases with parotid swelling found that 55% were male and 45% were female. The most common clinical presentation was swelling in the parotid region only, whereas (17.5%) patients presented with pain associated with swelling. Pleomorphic adenoma (76.5% of all parotid tumours) and mucoepidermoid carcinoma (2.9% of all parotid tumours) were the most common benign and malignant tumours respectively. Saldanha et al.^[9] in their study of 65 patients of salivary gland tumours observed that 48 (74%) were benign and 17 (26%) were malignant. Age of the patients was between 10 to 79 years. Parotid was the most commonly involved (72%) salivary gland. Pleomorphic adenoma (61.5% of all tumours) was the most common benign tumour whereas mucoepidermoid carcinoma (12.3% of all tumours) was the most common malignant tumour. In the study of 23 major salivary gland tumours done by Babu et al.^[10], 19 had parotid and 4 had submandibular salivary gland tumour. Out of the total 23 cases, 19 were benign and 4 were malignant. Pleomorphic adenoma was the most common benign salivary gland tumour and mucoepidermoid carcinoma was the most common malignant tumour.

II. METHODS

This study was conducted in a Medical College over a period of 18 months on 50 patients. Patients from all age groups were included in the study. All neoplastic swellings of the major salivary glands, confirmed by FNAC were included in the study. Autoimmune, inflammatory, granulomatous swelling involving major salivary glands were excluded. Detailed history was taken and thorough examination done in all cases. The specimens obtained after surgery were sent for Histopathological Examination. The pre-operative FNAC findings were compared with Post-operative Histo-pathological findings.

III. RESULTS

In our study, majority of the patients belong to the age group of 31-40 years (22%) followed by the age group of 41-50 years (20%) and the age group of 51-60 years (20%). The minimum and maximum age of the patients in our study was 11 and 79 years respectively. In our study, out of the total 50 patients, 27 (54.0%) were female and 23 (46.0%) were male.

Table -1: Age and sex distribution of Salivary gland tumours

Age-group	Male	Female	Total
0-10	-	-	-
11-20	4	1	5
21-30	-	7	7
31-40	4	7	11
41-50	5	5	10
51-60	5	5	10
61-70	3	1	4
71-80	2	1	3
Total	23	27	50

Out of the total 50 patients, 46 patients (92%) presented with swelling only while 4 patients (8%) presented with pain and swelling.

Parotid Gland was the most common salivary gland to be involved in our study (Figure-1). Out of the total 50 patients, 40 patients had tumours of the parotid gland and 10 patients had tumours of the submandibular gland.



Fig.-1: Clinical photograph of a pleomorphic salivary adenoma of the parotid gland.

In FNAC of the Parotid tumours (Table-2), pleomorphic adenoma was found to be the most common. Out of the total 40 cases, 34 were diagnosed as pleomorphic adenoma (85%). On histopathological examination of the parotid tumours, pleomorphic adenoma was also found to be the most common. Out of the total 40 cases, 29 (72.5%) were diagnosed as pleomorphic adenoma on histopathological examination.

Table 2: Correlation of FNAC and HPE of Parotid Tumours.

FNAC	No & % of Cases	Histopathological Diagnosis	No & % of Cases
High Grade Adenocarcinoma	1 (2.5%)	High Grade Adenocarcinoma	1 (2.5%)
Epithelial Neoplasm	1 (2.5%)	Adenoid Cystic Carcinoma	1 (2.5%)
Mucoepidermoid Carcinoma	4 (10%)	Mucoepidermoid carcinoma	2 (5%)
		Warthin Tumour	2 (5%)
Pleomorphic Adenoma	34 (85%)	Warthin Tumour	3 (7.5%)
		Myoepithelioma	2 (5%)
		Pleomorphic Adenoma	29 (72.5%)

Total	40 (100%)	Total	40 (100%)
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In FNAC of the submandibular salivary gland tumours (Table-3), pleomorphic adenoma was found to be the most common. Out of the total 10 cases, 8 cases were diagnosed as pleomorphic adenoma (80%). On histopathological examination of the submandibular salivary gland tumours, pleomorphic adenoma (Figure-2) was also found to be the most common.

Table 3: Correlation of FNAC and HPE of Submandibular Tumours.

FNAC	No & % of Cases	Histopathological Diagnosis	No & % of Cases
Hemangioma	2 (20%)	Pleomorphic Adenoma	2 (20%)
Pleomorphic Adenoma	8 (80%)	Pleomorphic Adenoma	8 (80%)
Total	10 (100%)	Total	10 (100%)

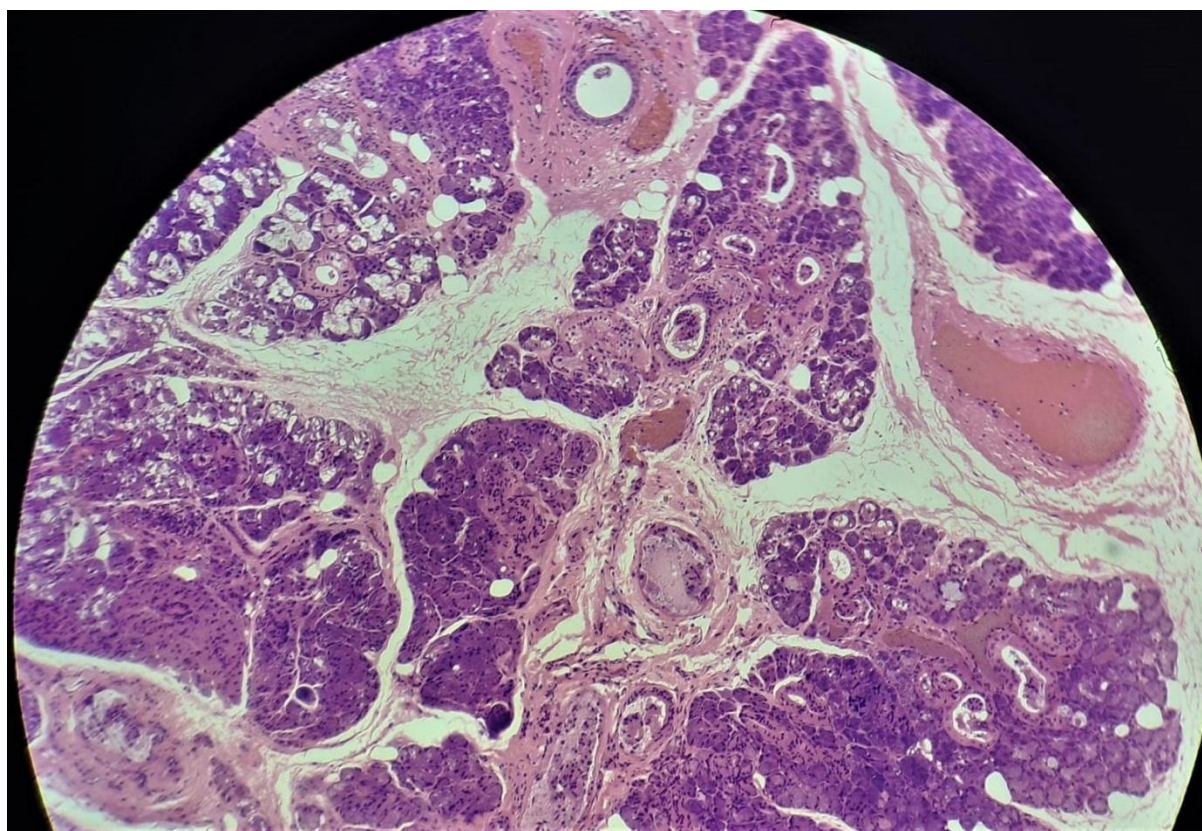


Fig.-2: Microscopic picture of pleomorphic salivary adenoma of the submandibular salivary gland.

Out of the total 50 cases, 40 cases had the same findings in FNAC and histopathological examination (80% cases) whereas in 10 cases, the findings of FNAC and histopathological examination were different. Among the benign tumours, pleomorphic adenoma and myoepithelioma were more common in females. Warthin's tumours were found only in males. Among the malignant tumours, mucoepidermoid carcinoma was found equally in males and females. Adenoid cystic carcinoma and adenocarcinoma were found only in males (Table-4).

Table-4: Sex distribution of different salivary gland tumours.

Sl. No.	Tumours	Number	Percentage	Male	Female
1	Benign Tumours				
	Pleomorphic Adenoma	39	78	15	24
	Warthin's tumour	5	10	5	0
	Myoepithelioma	2	4	0	2
	Total	46	92	20	26
2	Malignant Tumours				
	Mucoepidermoid Carcinoma	2	4	1	1
	Adenoid Cystic Carcinoma	1	2	1	0
	High Grade Adenocarcinoma	1	2	1	0
	Total	4	8	3	1
	Grand Total	50	100	23	27

Out of the total 46 benign tumours, 36 (78.3%) were in the parotid gland and 10 (21.7%) were in the submandibular gland. Pleomorphic adenoma was the most common (85%) benign tumour. Warthin's tumour and myoepithelioma were found only in the parotid gland. Out of the 4 malignant cases in our study, 2 were mucoepidermoid carcinoma (50%). In our study, all the malignant tumours were parotid tumours.

IV. DISCUSSION

In the study done by Torabinia et al.^[1], 51.2% were females and 48.8% were males. Vasconcelos et al.^[11] observed 51.4% were females and 48.6% were males. Cunha et al.^[12] found 55.8% were females and 44.2% were males. In our study, 54% were females and 46% were males, which is similar to the above studies. In contrast, studies done by Tejaswini et al.^[7], Gautam et al.^[8] and Babu et al.^[10], males were more affected than females.

In our study, the parotid tumours were more frequent in females whereas submandibular gland tumours were more frequent in males.

Bommareddy et al.^[6], Saldanha et al.^[9] and Babu et al.^[10] observed in their studies that the most commonly involved salivary gland was the parotid gland. In our study also, parotid was the most commonly involved salivary gland (80%), which corroborates with the above studies.

Saldanha et al.^[9] in their study of 65 cases found that 18.46% had pain in addition to swelling. Bommareddy et al.^[6] in their study found that 86.53% patients presented with only swelling of the involved gland and 13.46% patients presented with swelling associated with pain. In our study, 46 (92%) patients presented with swelling only whereas 4 (8%) patients presented with swelling associated with pain.

Mejía-Velázquez et al.^[13] in their study of 360 cases of salivary gland tumours found 277 were benign, while 83 were malignant. Nepal et al.^[3] in their study of 51 cases found 41 cases (81%) were benign and 10 cases (19%) were malignant. Cunha et al.^[12] observed that 470 cases (79.9%) were benign and 118 cases (20.1%) were malignant. Bommareddy et al.^[6] in their study of 52 cases, found 50 cases (96.15%) were benign and 2 cases (3.8%) were malignant. Babu et al.^[10] found 82.6% cases were benign and 17.4% cases were malignant. In our study, we observed that 46 (92%) cases were benign and 4 (8%) cases were malignant. This is similar to most of the other studies conducted on salivary gland tumours.

Torabinia et al.^[1], Vasconcelos et al.^[11], Venkatesh et al.^[5], Cunha et al.^[12], Tejaswini et al.^[7], Gautam et al.^[8], and Babu et al.^[10] in their studies found pleomorphic adenoma to be the most common benign tumour. In our study also, pleomorphic adenoma was the most common benign tumour.

Cunha et al.^[12], Tejaswini et al.^[7], Gautam et al.^[8], Saldanha et al.^[9], and Babu et al.^[10] in their study observed that mucoepidermoid carcinoma was the most common malignant tumour. In our study also, mucoepidermoid carcinoma was the most common malignant tumour.

V. CONCLUSION

Although salivary gland tumours are relatively uncommon, a significant portion (8%) is found to be malignant. Malignant tumours are more common in the parotid glands (10% of all parotid tumours). Few of the benign tumours can also transform into malignant lesions. Early diagnosis is the key to their effective management. A thorough clinical examination along with FNAC and imaging are of utmost importance in the diagnosis of salivary gland tumours. However, it must be kept in mind that certain tumours like myoepithelioma may not be detected in FNAC.

Conflict of Interest: None.

REFERENCES

- [1]. Torabinia N, Khalesi S. Clinicopathological study of 229 cases of salivary gland tumors in Isfahan population. *Dent Res J (Isfahan)*. 2014 Sep;11(5):559-63. PMID: 25426146; PMCID: PMC4241608.
- [2]. Stenman G. Fusion oncogenes in salivary gland tumors: molecular and clinical consequences. *Head Neck Pathol*. 2013 Jul;7 Suppl 1(Suppl 1):S12-9. doi: 10.1007/s12105-013-0462-z. Epub 2013 Jul 3. PMID: 23821214; PMCID: PMC3712096.
- [3]. Nepal A, Chettri ST, Joshi RR, Bhattarai M, Ghimire A, Karki S. Primary salivary gland tumors in eastern Nepal tertiary care hospital. *J Nepal Health Res Counc*. 2010 Apr;8(1):31-4. PMID: 21879011.
- [4]. Bobati SS, Patil BV, Dombale VD. Histopathological study of salivary gland tumors. *J Oral Maxillofac Pathol*. 2017 Jan-Apr;21(1):46-50. doi: 10.4103/0973-029X.203762. PMID: 28479686; PMCID: PMC5406818..
- [5]. Venkatesh S, Srinivas T, Hariprasad S. Parotid Gland Tumors: 2-Year Prospective Clinicopathological Study. *Ann Maxillofac Surg*. 2019 Jan-Jun;9(1):103-9. doi: 10.4103/ams.ams_179_18. PMID: 31293936; PMCID: PMC6585209
- [6]. Bommarreddy, R. R., Gogineni, R. C., Adusumalli, R. S., Mallavarapu, D., & Dunga, S. (2022). Clinicopathological study and management of salivary gland neoplasms in a tertiary care hospital. *International Surgery Journal*, 9(2), 388-91. <https://doi.org/10.18203/2349-2902.isj20220328>
- [7]. V Sai Tejaswini, Swagathika Mishra, N. Kavya Keerthika, Koya Srikanth and Ch. Santoshi. A Clinicopathological study of salivary gland neoplasms in a tertiary care hospital: A three year study. *Int. J. Appl. Dent. Sci*. 2022;8(3):243-5. DOI: 10.22271/oral.2022.v8.i3d.1597
- [8]. Gautam SK, Kumar S, Singh HP, Singh AB, Chandra M. Clinico-pathological profile of parotid gland tumors at a tertiary care center in North India. *Natl J Maxillofac Surg*. 2023 Sep-Dec;14(3):438-43. doi: 10.4103/njms.njms_111_22. Epub 2023 Nov 10. PMID: 38273931; PMCID: PMC10806317.
- [9]. Dr Crysle Saldanha, Dr ParasappaYaranal, & Dr Krishnaraj Upadhyaya. A clinicopathological study of salivary gland tumors. *Tropical Journal of Pathology and Microbiology*. 2018;4(7):532-8. <https://doi.org/10.17511/jopm.2018.i07.09>
- [10]. Babu N., S., Mahadev, N. H., & V., K. G. A clinical study of the incidence of salivary gland tumors in a tertiary care teaching hospital. *International Surgery Journal*, 2019;6(6):2110-3. <https://doi.org/10.18203/2349-2902.isj20192376>
- [11]. Vasconcelos AC, Nör F, Meurer L, Salvadori G, Souza LB, Vargas PA, Martins MD. Clinicopathological analysis of salivary gland tumors over a 15-year period. *Braz Oral Res*. 2016;30:S1806-83242016000100208. doi: 10.1590/1807-3107BOR-2016.vol30.0002. Epub 2015 Dec 15. PMID: 26676198
- [12]. Cunha JL, Coimbra AC, Silva JV, Nascimento IS, Andrade ME, Oliveira CR, Almeida OP, Soares CD, Sousa SF, Albuquerque-Júnior RL. Epidemiologic analysis of salivary gland tumors over a 10-years period diagnosed in a northeast Brazilian population. *Med Oral Patol Oral Cir Bucal*. 2020 Jul 1;25(4):e516-e522. doi: 10.4317/medoral.23532. PMID: 32388524; PMCID: PMC7338061.
- [13]. Mejía-Velázquez CP, Durán-Padilla MA, Gómez-Apo E, Quezada-Rivera D, Gaitán-Cepeda LA. Tumors of the salivary gland in Mexicans. A retrospective study of 360 cases. *Med Oral Patol Oral Cir Bucal*. 2012 Mar 1;17(2):e183-9. doi: 10.4317/medoral.17434. PMID: 22143697; PMCID: PMC3448317.