

Retrospective Observational Research Analysing Salivary Gland Tumours at a Tertiary Care Facility

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Received: 07-09-2023 / Revised: 13-10-2023 / Accepted: 22-11-2023

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Conflict of interest: Nil

Abstract

Aim: Retrospective analysis of salivary gland tumours at a specialized medical facility

Material and Methods: This study was conducted as a retrospective cross-sectional study in the Department of ENT, IGIMS, Patna, Bihar, India from April 2018 to March 2019. All patients with salivary gland swelling who underwent surgery. The demographic details, clinical descriptions were analyzed from the medical records available. All patients with salivary gland swelling confirmed with ultrasound and Fine needle aspiration and those who underwent excision were included in the study. Non-neoplastic causes on FNAC were excluded. Incidence of occurrence of the tumors were separated based on the gland involved, age of the patient, histopathological classification as benign or malignant.

Results: A total of 36 patients were included in the study on the basis of clinical and pathological records. Out of 36 patients studied 24 were females and 12 were males with a ratio of 2:1. Age distribution of the studied cases showed that the most common affected age group amongst females was 41 to 50 years whereas amongst male most common affected age group was found to be 51-60 years. The difference in mean age of females and males were statistically significant (>0.05). The overall mean age of the patients was found to be 49.45 years. The frequency of distribution of tumors based on involved salivary gland showed that the parotid gland was the commonest involved (81.3%) followed by submandibular gland (16.7%) and sublingual/minor salivary glands (2%). The pathological distributions were benign in 87.3% and malignant in 12.7%. Among the benign lesions, Pleomorphic adenoma was the commonest tumor reported followed by Warthin's tumor and myoepithelioma.

Conclusion: The results of the present study reinforces prevalence of salivary gland tumors. The parotid gland is the most common location and pleomorphic adenoma are the most frequent lesions. The malignant tumors also can occur in these glands and good clinical suspicion is necessary.

Keywords: Salivary gland tumours, Histology of salivary gland,

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Introduction

Salivary gland tumours, although relatively rare, present a significant challenge in head and neck oncology due to their diverse histological types and complex anatomical considerations. These tumours can arise in the major salivary glands, including the parotid, submandibular, and sublingual glands, as well as the numerous minor salivary glands scattered throughout the oral cavity and oropharynx. [1] Understanding the epidemiology, clinical presentation, diagnostic modalities, and management strategies is crucial for optimizing patient outcomes. Salivary gland tumours account for less than 5% of head and neck cancers, with an annual incidence of approximately 1 to 2 cases per 100,000 individuals. The parotid gland is the most commonly affected site, representing about 70% of all salivary gland tumours, with the majority being benign. In contrast, submandibular and minor salivary gland tumours have a higher likelihood of

malignancy. The incidence varies with age, sex, and geographic location, with a slight male predominance and higher rates observed in individuals over 50 years of age. [2]

The clinical presentation of salivary gland tumours can vary widely depending on the tumour's location, size, and histological type. Patients typically present with a painless, slow-growing mass in the affected gland. However, malignant tumours may present with pain, facial nerve paralysis, rapid growth, and fixation to surrounding tissues. Symptoms such as difficulty swallowing, trismus, and referred otalgia may also be observed in advanced cases. [3] Salivary gland tumours are histologically diverse, with over 30 different types identified. The World Health Organization (WHO) classifies these tumours into benign and malignant categories. Pleomorphic adenoma is the most common benign tumour, whereas mucoepithelioid carcinoma and

adenoid cystic carcinoma are the most prevalent malignant types. Each histological type has distinct biological behaviour and prognosis, necessitating tailored therapeutic approaches. [4,5]

Accurate diagnosis of salivary gland tumours involves a combination of clinical examination, imaging studies, and histopathological evaluation. Fine needle aspiration cytology (FNAC) is commonly used for initial assessment due to its minimally invasive nature and high diagnostic accuracy. Imaging modalities such as ultrasound, magnetic resonance imaging (MRI), and computed tomography (CT) scans are crucial for evaluating tumour extent, involvement of adjacent structures, and lymph node status. Recently, positron emission tomography (PET) has emerged as a valuable tool for detecting metastatic disease and assessing treatment response. [6] The management of salivary gland tumours is multifaceted and depends on the tumour's histological type, stage, and location. Surgical resection remains the cornerstone of treatment for both benign and malignant tumours. For benign tumours, complete excision with a margin of normal tissue is usually curative. Malignant tumors often require more extensive surgery, including neck dissection for lymph node metastasis. [7,8]

Material and Methods

This study was conducted as a retrospective cross-sectional study in the Department of ENT, IGIMS, Patna, Bihar, India from April 2018 to March 2019. All patient with salivary gland swelling who underwent surgery. The demographic details, clinical descriptions were analyzed from the medical records available. All patients with salivary gland

swelling confirmed with ultrasound and Fine needle aspiration and those who underwent excision were included in the study. Non-neoplastic causes on FNAC were excluded. Incidence of occurrence of the tumors were separated based on the gland involved, age of the patient, histopathological classification as benign or malignant. The distribution and frequency of the same are recorded. All data were tabulated and statistically analyzed.

Results

A total of 36 patients were included in the study on the basis of clinical and pathological records. Out of 36 patients studied 24 were females and 12 were males with a ratio of 2:1. Age distribution of the studied cases showed that the most common affected age group amongst females was 41 to 50 years whereas amongst male most common affected age group was found to be 51-60 years (Table 1). The difference in mean age of females and males were statistically significant (>0.05). The overall mean age of the patients was found to be 49.45 years. The frequency of distribution of tumors based on involved salivary gland showed that the parotid gland was the commonest involved (81.3%) followed by submandibular gland (16.7%) and sublingual/minor salivary glands (2%) (Table 1). The pathological distributions were benign in 87.3% and malignant in 12.7%. Among the benign lesions, Pleomorphic adenoma was the commonest tumor reported followed by Warthin's tumor and myoepithelioma. Out of the malignant lesions analyzed, mucoepidermoid carcinoma was found to be the commonest followed by adenoid cystic carcinoma, clear cell carcinoma (Table 1).

Table 1: Comprehensive analysis of Salivary gland tumors.

Tumors	Total	Gender		Mean age	Gland involved*
		Male	Female		
Benign- 30					
Pleomorphic adenoma	23	13	10	41.8	P-18, SM-5
Warthin tumour	4	3	1	33.7	P-4
Myoepithelioma	2	2	0	58.8	P-1, SM-1
Oncocytoma	1	0	1	49	P-1
Malignant- 6					
Adenoid cystic carcinoma	1	0	1	17	O-1
Mucoepidermoid carcinoma	3	2	1	57	P-3
Clear cell carcinoma	1	0	1	39	P-1
Acinic cell carcinoma	1	0	1	47	P-1

*P-parotid, SM-submandibular, O-others

Discussion

About 5-6% of all head and neck tumors originate from one or the other salivary gland. [7,8] Its incidence has been reported to be 5-6 per 100000 individuals in United States. These neoplasms are

more likely to occur in relatively old age (6th decade), benign salivary gland tumors usually occur relatively earlier (4-5th decade). [8-10] 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. [9,10] Almost 80% salivary gland neoplasms arise in parotid gland followed by submandibular gland (10-15%) and sublingual and minor salivary glands which is in concurrence with the results obtained in this study. [10] Salivary gland tumors have been uniformly reported to be more common in females as compared to males. [11]

Torabinia 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). [12] Similar male preponderance was reported by Jaafari-Ashkavandi et al and Lee et al. [13] The mean age of the studied cases in our study was found to be 47.06 years. Araya 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. [14] Prevalence and incidence rates per 100,000 persons were 15.4 and 2.51, respectively. Most of the neoplasms corresponded to benign tumors. The most affected gland was the parotid gland. Pleomorphic adenoma was the most common benign tumor 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 which is a higher age than the study population analyzed in our study.

Bobati et al conducted a retrospective study of salivary gland neoplasms where out of data of 59 cases, 43 (69.16%) cases were classified as benign tumors and 16 (22.39%) cases as malignant tumors. 14 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. Pleomorphic adenoma was found to be most common salivary gland tumor in the studies conducted by Zarbo et al as in this study. [15,16]

In our study, the most common malignant tumor in the affected cases was found to be mucoepidermoid carcinoma. 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. [17] In our study, one case of adenoid cystic carcinoma of the palate, one case of clear cell carcinoma was found which

are rare to be occurring at these sites which is in concurrence with available literature. The limitations of the study were its retrospective analysis, many of the patients were lost to follow up with no data on recurrence rates.

Conclusion

The results of the present study reinforce prevalence of salivary gland tumors. The parotid gland is the most common location and pleomorphic adenoma are the most frequent lesions. The malignant tumors also can occur in these glands and good clinical suspicion is necessary.

References

1. Speight PM, Barrett AW. Salivary gland tumours. *Oral Dis.* 2002;8(5):229-240. DOI:10.1034/j.1601-0825.2002.02870.x.
2. Bradley PJ, McGurk M. Incidence of salivary gland neoplasms in a defined UK population. *Br J Oral Maxillofac Surg.* 2016;54(2):124-131. DOI: 10.1016/j.bjoms.2015.10.013.
3. Lloyd S, McHugh C, Nagraj S, Whitfield PC. Salivary gland tumours: Current concepts. *Oncol Ther.* 2010;6(1):31-45.
4. Barnes L, Eveson JW, Reichart P, Sidransky D. *World Health Organization Classification of Tumours. Pathology and Genetics of Head and Neck Tumours.* IARC Press; 2017.
5. Al-Sayed AA, Penas-Prado M, Kies MS, El-Naggat AK, Glisson BS. Diagnostic approach to salivary gland neoplasms. *Expert Rev Anti cancer Ther.* 2012;12(9):1161-1168. DOI:10.1586/era.12.84.
6. Lewis JE, Olsen KD, Sebo TJ. Carcinoma ex pleomorphic adenoma: Pathologic analysis of 73 cases. *Hum Pathol.* 2017;48:49-54. DOI: 10.1016/j.humpath.2015.12.004.
7. Teymoortash A, Werner JA. Tissue sparing surgery in the management of benign parotid tumors: Indications, techniques, and results. *Int J Oral Maxillofac Surg.* 2010;39(12):1206-1213. DOI: 10.1016/j.ijom.2010.06.002.
8. Terhaard CH, Lubsen H, Van der Tweel I, et al. Salivary gland carcinomas: Clinical outcome and prognostic factors in 565 patients. *Int J Radiat Oncol Biol Phys.* 2015;61(1):112-123. DOI: 10.1016/S0360-3016(04)00754-1.
9. Laurie SA, Ho AL, Fury MG, Sherman EJ, Pfister DG. Systemic therapy in the management of metastatic or locally recurrent salivary gland cancer. *Oral Oncol.* 2011;47(3):192-196. DOI:10.1016/j.oraloncology.2011.01.006.
10. Nader ME, Bell D, Sturgis EM, Ginsberg LE, Gidley PW. Facial Nerve Paralysis due to a Pleomorphic Adenoma with the Imaging Characteristics of a Facial Nerve Schwannoma. *J Neurol Surg Rep.* 2014;75(1):84-8.

11. Lewis AG, Tong T, Maghami E. Diagnosis and Management of Malignant Salivary Gland Tumors of the Parotid Gland. *Otolaryngol Clin North Am.* 2016;49(2):343-80.
12. Torabinia N, Khalesi S. Clinicopathological study of 229 cases of salivary gland tumors in Isfahan population. *Dent Res J (Isfahan).* 2014; 11(5):559-63.
13. Ashkavandi Z, Ashraf MJ, Moshaverinia M. Salivary gland tumors: a clinicopathologic study of 366 cases in southern Iran. *Asian Pac J Cancer Prev.* 2013;14(1):27-30.
14. Bobati SS, Patil BV, Dombale VD. Histopathological study of salivary gland tumors. *J Oral Maxillofac Pathol.* 2017;21(1): 46-50.
15. Zarbo RJ. Salivary gland neoplasia: a review for the practicing pathologist. *Mod Pathol.* 2002;15(3):298- 323.
16. Peel RL, Seethala RR. Pathology of salivary gland disease. In: Myers EN, Ferris RL, ed. *Salivary Gland Disorders.* Berlin, Germany: Springer; 2007: 33-104.
17. Sathish N, Mahadev Naveen, Kumar V. A clinical study of the incidence of salivary gland tumors in a tertiary care teaching hospital. *ISJ.* 2019;6:2110