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Original Article

A Study on Clinical and Pathological Aspects of Salivary Gland Swellings

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Abstract

Introduction: Salivary gland swellings can be broadly classified into inflammatory, non- inflammatory, and neoplastic swellings. Most of primary epithelial tumors occur in parotid glands. About 7–11% in the submandibular glands are malignant. Less than 1% occurs in the sublingual glands. About 9–23% occur in the minor glands. About 15–30% of tumors of parotid gland are malignant. About 40% in the submandibular gland are malignant. About 50% in the minor salivary gland are malignant. About 70–90% of sublingual glands are malignant. Appropriate treatment management should be planned earlier, local excision for benign neoplasm, or radical surgery for malignancy. With non-neoplastic lesions, metastasis and lymph proliferative disorders, conservative management, chemotherapy, or radiotherapy might be respectively preferable.

Methodology: In this study, an attempt has been made to present various conditions of the salivary gland swellings admitted in surgical units in tertiary centers Osmania General Hospital and surgical oncology unit MNJ Cancer Hospital, Hyderabad, from December 2018 to November 2020. All the cases are analyzed and compared to the data available in literature.

Results: The incidence of salivary gland swellings is highest in the 3rd and 4th decade of life. In this series, 17 patients were male (34%) and 33 (66%) patients were female, with male-to-female ratio of 1:1.9. The most common salivary swellings were seen in parotid gland with 32 cases (64%). Out of 50 cases, 18 cases (36%) were due to non-inflammatory and non-neoplastic swellings. Out of which, 14 cases (77.8%) were due to submandibular sialolithiasis and 3 cases (16.7%) were due to ranula of the sublingual glands and 1 (5.6%) case of sublingual retention cyst. Thirty-two cases (64%) were due to salivary gland tumors. Out of 32 tumors, pleomorphic adenoma is seen in 27 cases (84.4%), Warthin's tumor is seen in 4 cases (12.5%), and one case of adenoid cystic carcinoma (3.1%). Incidence of tumors was highest in the parotid. Incidence of benign tumors is 31 (96.8%) and malignant tumors are 1 (3.1%). Patients presented with a history of swellings varying from 4 months to 5 years. Swelling is the most common symptom. Pain was the second most common symptoms. Pain was noticed in 52% of the cases and tenderness was noticed in 56% of the cases. History and physical examination complement fine-needle aspiration cytology (FNAC) and help in diagnosis. FNAC is the reliable and sensitive tool for diagnosing salivary gland tumors. There was an overall diagnostic accuracy of 100%. Surgery is the treatment in all the cases of salivary swelling. Out of 32 cases of parotid tumor, superficial parotidectomy was done in 28 cases (87.5%) and total parotidectomy for 4 cases (12.5%). For all the submandibular gland lesions, sialadenectomy was done. Sublingual gland excision was carried out for three cases of ranula and one retention cyst excision. Wound infection was the major complication with 5 cases (62.5%) and three cases of facial nerve paralysis (37.5%) were observed. The results were compared with previously published studies, with respect to objectives.

Conclusion: With proper diagnosis and appropriate treatment Salivary gland swelling can be cured with almost 100%. Successful management of the salivary gland neoplasm depends on accurate clinical assessment and diagnosis, with appropriate use of fine-needle aspiration and computed tomography or magnetic resonance imaging. Since the most malignant tumors are asymptomatic and long-standing benign tumors can undergo malignant change, community awareness and early referral are necessary, as prognosis is good if treated early.

Key words: Salivary gland tumors, Pleomorphic adenoma, Fine-needle aspiration cytology, Parotid, Submandibular gland, Sublingual glands, Ranula, Sialoadenectomy, Facial nerve paralysis

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INTRODUCTION

Salivary gland swellings can be broadly classified into inflammatory, non-inflammatory, and neoplastic swellings such as benign tumors or malignant tumors and connective tissue diseases such as hemangioma, lymphangioma, and neurofibroma, and other autoimmune diseases

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such as Sjogren's syndrome and Mikulicz disease.[1] Accurate pathological diagnosis is necessary for proper management of neoplastic disorders. Most of primary epithelial tumors occur in parotid glands. About 7–11% in the submandibular glands are malignant. Less than 1% occurs in the sublingual glands. About 9–23% occur in the minor glands. About 15–30% of tumors of parotid gland are malignant. About 40% in the submandibular gland are malignant. About 50% in the minor salivary gland are malignant. About 70–90% of sublingual glands are malignant.[2-4] These salivary gland tumors usually occur in adults with a female predominance. Warthin's tumor (WT) is more common in males.[5,6] Fine-needle aspiration cytology (FNAC) of salivary gland tumors is helpful to both the patient and the clinician. Its immediate results, accuracy, lack of complications, and economy are favorable. Appropriate treatment management can be planned earlier, local excision for benign neoplasm, or radical surgery for malignancy. With non-neoplastic lesions, metastasis and lymph proliferative disorders, conservative management, chemotherapy, or radiotherapy might be respectively preferable.[7] In this study, an attempt has been made to present various conditions of the salivary gland swellings admitted in tertiary centers Osmania General Hospital and MNJ Cancer Hospital, Hyderabad,

Table 1: Incidence of salivary gland swellings at Osmania General Hospital and MNJ Cancer Hospital, Hyderabad

Year	Total no. of surgical admissions	Total no. of salivary gland swellings	Percentage
December 2018–November 2020	12,361	50	0.4%

Table 2: Age incidence of salivary gland swellings

Age	Frequency	Percent
Below 20	6	12
21–30	4	8
31–40	15	30
41–50	9	18
51–60	6	12
61–70	8	16
71–80	2	4

Table 3: Correlation of age with HPE

Age in years	Number (%)	Histopathologic examination result				Total	*P* value
		Pleomorphic adenoma of parotid	Warthin's tumor of parotid	Adenocarcinoma parotid	Retention cyst		
Below 20	Count	4	0	0	1	5	0.052
	% within age in years	80.0%	0.0%	0.0%	20.0%	100.0%	
	% within histopathologic examination result	14.8%	0.0%	0.0%	100.0%	15.2%	
21–30	Count	1	0	0	0	1	
	% within AGE IN YEARS	100.0%	0.0%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	3.7%	0.0%	0.0%	0.0%	3.0%	
31–40	Count	8	1	0	0	9	
	% within AGE IN YEARS	88.9%	11.1%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	29.6%	25.0%	0.0%	0.0%	27.3%	
41–50	Count	6	0	0	0	6	
	% within AGE IN YEARS	100.0%	0.0%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	22.2%	0.0%	0.0%	0.0%	18.2%	
51–60	Count	2	2	0	0	4	
	% within age in years	50.0%	50.0%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	7.4%	50.0%	0.0%	0.0%	12.1%	
61–70	Count	5	1	0	0	6	
	% within age in years	83.3%	16.7%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	18.5%	25.0%	0.0%	0.0%	18.2%	
71–80	Count	1	0	1	0	2	
	% within age in years	50.0%	0.0%	50.0%	0.0%	100.0%	
	% within histopathologic examination result	3.7%	0.0%	100.0%	0.0%	6.1%	
Total	Count	27	4	1	1	33	
	% within age in years	81.8%	12.1%	3.0%	3.0%	100.0%	
	% within histopathologic examination result	100.0%	100.0%	100.0%	100.0%	100.0%	

from December 2018 to November 2020. All the cases are analyzed and compared to the data available in literature.

Aims and Objectives of the Study

The aims and objectives of the study were as follows:

1) To study the age and sex distribution among cases of salivary gland swellings.
2) To study the mode of clinical presentation of various salivary gland swellings.
3) To study the accuracy of FNAC in the diagnosis of salivary gland swellings
4) To study the methods of current surgical treatment of salivary glands swellings.

METHODOLOGY

This prospective study of consecutive cases of salivary gland swellings is based on 50 cases admitted in various surgical units in Osmania General Hospital and MNJ Cancer Hospital, Hyderabad, from December 2018 to November 2020. Fifty cases of salivary gland swelling are studied and data are presented here, which were analyzed and conclusion drawn, presented in tabular form with explanatory notes below each table. The statistics has been compared with different standard studies conducted on same subject by various authors around world.

Table 4: Sex incidence

Sex	No. of patients	Percentage
Male	17	34
Female	33	66

Inclusion Criteria

- All patients admitted to surgical and surgical oncology wards of Osmania General Hospital and MNJ Cancer Hospital, Hyderabad, with salivary gland swellings due to obstructions of the salivary duct and neoplasia.
- Patients who are willing for investigation and treatment were included in the study.

Exclusion Criteria

- All salivary gland swellings arising as a result of congenital conditions.
- Salivary gland swellings arising as a result of inflammation (e.g., mumps and parotitis). Salivary swellings associated with systemic diseases (Sjogren's syndrome).

All patients admitted were evaluated by documenting the history, through clinical examination, routine laboratory investigations, and specific investigations such as FNAC and X-rays of mandible were done for all patients in the study group. After evaluation of the swellings by clinical examination and by specific investigations, a surgical plan was formulated. The final decision was taken peroperatively by the surgeon. The required specimen was sent for histopathological examinations. Appropriate antibiotics and analgesics are administered postoperatively for all cases. Drainage tube was removed when the drain was <20 ml and sutures were removed on the 5th day. The adjuvant treatment was decided depending on the final HPE report. Different modalities of treatment adopted in this study are as follows: (1) Surgery alone and (2) surgery and post-operative radiotherapy. The follow-up period

Table 5: Correlation of sex with HPE reports

Sex	Number (%)	Histopathologic examination result				Total	*P* value
		Pleomorphic adenoma of parotid	Warthin's tumor of Parotid	Adeno carcinoma parotid	Retention cyst		
Male	Count	8	1	1	1	11	
	% within sex	72.7%	9.1%	9.1%	9.1%	100.0%	
	% within histopathologic examination result	29.6%	25.0%	100.0%	100.0%	33.3%	
Female	Count	19	3	0	0	22	0.232
	% within sex	86.4%	13.6%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	70.4%	75.0%	0.0%	0.0%	66.7%	
Total	Count	27	4	1	1	33	
	% Within Sex	81.8%	12.1%	3.0%	3.0%	100.0%	
	% within histopathologic examination result	100.0%	100.0%	100.0%	100.0%	100.0%	

of these patients ranged from 1 month to 10 months. All patients were asked for follow-up after 15 days of surgery then every month to detect morbidity and recurrence. Long-term follow-up is necessary to study the actual prognosis of the patients and tumor recurrence and to know the ideal mode of treatment for each condition which was not possible in this study. Statistical analysis was done with SPSS software.

Table 6: Mode of clinical presentation

Mode	No. of cases	Percentage
Swelling	50	100.0
Pain	26	52.0
Fever	3	6.0
Increased salivation	1	2.0
Tenderness	28	56.0
Fixity of swelling	7	14.0
Ear lobe elevation	24	48.0
Deep lobe involvement	5	10.0
Facial nerve paralysis	3	6

Table 7: Site for various salivary gland swellings

No. of cases	Parotid	Submandibular	Sublingual
50	32	14	4
%	64	28	8

RESULTS

A total number of admission to the department of general surgery and surgical oncology were 12,361, 50 cases of salivary gland swellings were admitted during November 2018–August 2020. This constitutes 0.4% of total admissions as shown in Table 1.

In our study, age of the patients varied from 18 years to 80 years, average age of the patient was 40 years. The case of lowest age group, that is, 18 years was of non-inflammatory swelling and the case of highest age, that is, 80 years was of tumor swelling as shown in Table 2.

On descriptive statistical analysis, of age in year with HPE reports, *P* value was found to be = 0.052, which was > 0.050 and hence *P* value was not significant. It indicates not significant between age group and HP reports in our study. Graph 1 shows the age incidence with hpe and table-3 shows the correlation of age with hpe.

In our study of salivary gland swelling due to various causes, out of 50 cases, 17 (34%) cases were of male and 33 (66%) cases of female. as shown in Table 4. On descriptive statistical analysis, of sex distribution with HPE reports,

Table 8: Correlation of site with HPE reports

Gland involvement	Number (%)	Histopathologic examination result				Total	*P* value
		Pleomorphic adenoma of parotid	Warthin's tumor of parotid	Adenocarcinoma parotid	Retention cyst		
Parotid	Count	21	4	1	0	26	
	% within gland involvement	80.8%	15.4%	3.8%	0.0%	100.0%	
	% within histopathologic examination result	77.8%	100.0%	100.0%	0.0%	78.8%	
Submandibular duct	Count	6	0	0	0	6	
	% within gland involvement	100.0%	0.0%	0.0%	0.0%	100.0%	
	% within histopathologic examination result	22.2%	0.0%	0.0%	0.0%	18.2%	<0.001
Sublingual gland	Count	0	0	0	1	1	
	% within gland involvement	0.0%	0.0%	0.0%	100.0%	100.0%	
	% within histopathologic examination result	0.0%	0.0%	0.0%	100.0%	3.0%	
Total	Count	27	4	1	1	33	
	% within gland involvement	81.8%	12.1%	3.0%	3.0%	100.0%	
	% within histopathologic examination result	100.0%	100.0%	100.0%	100.0%	100.0%	

Table 9: Various causes of salivary gland swellings

Lesions	No. of cases	Percentage
Non-inflammatory, non-neoplastic	18	36.0
Neoplastic	32	64.0
Total	50	100.0

Table 10: Incidence of non-inflammatory, non-neoplastic swellings

Lesions	No. of cases	Percentage
Sialolithiasis	14	77.8
Ranula	3	16.7
Retention cyst	1	5.6

Table 11: site involvement in non-inflammatory, non-neoplastic swellings

No. of cases	Parotid		Submandibular		Sublingual	
	R	L	R	L	R	L
18	-	-	6	8	4	-

Table 12: Incidence of benign and malignant salivary gland tumors

Lesions	No. of cases	Percentage
Benign	31	96.88%
Malignant	1	3.1%

Table 13: Incidence of various salivary glands tumors

Lesion	No. of cases	Percentage
Pleomorphic adenoma	27	84
Warthin tumor	4	14
Adenoid cystic carcinoma	1	2
Total	32	100

Table 14: Correlation of FNAC and histopathology

Lesion	No. of cases	FNAC (%)	Biopsy (%)
Pleomorphic adenoma	27	100	100
Warthin tumor	4	100	100
Adenoid cystic Ca.	1	100	100

Table 15: Surgical procedures adopted for various salivary gland swellings

Procedures	No. of cases	Percentage
Excision of submandibular gland	15	30%
Superficial parotidectomy	26	52%
Total parotidectomy	5	10%
Excision ranula	3	6%
Retention cyst	1	2%
Total	50	100

Table 16: Post-operative complications

Nature of complications	No. of patients	Percentage
Facial nerve paralysis	3	37.5
Wound infection	5	62.5

Table 17: Occupation

Occupation	Frequency	Percent
Agri	5	10.0
Coolie	3	6.0
EMPL	1	2.0
Farmer	7	14.0
H.W	23	46.0
STU	6	12.0
Vendor	5	10.0

Table 18: Incidence per year of salivary gland tumors in different series

Series	No. of tumors	Period of study	No. of cases per year
Potdar *et al.*,[8]1969	188	10	18
Gupta *et al.*,[9] 1975	113	21	05
Khazanchi *et al.*,[10] 1988	88	6	15
Fennetal,[11] 1982	57	15	04
Renehan *et al.*,[12] 1996	1194	45	27
Present study	32	0.9	28

Table 19: Incidence of sialolithiasis in various studies

Series	No. of cases	parotid	Submandibular	Sublingual
Antognini *et al.*,[13] 1971	396	8.3	91.4	0.3
Pizzirani *et al.*,[14] 1985	102	7.8	92.2	-
Lustmann *et al.*,[15] 1990	245	4.5	94.3	0.4
Present study	14	-	100	-

Table 20: Frequency of benign and malignant salivary tumors in different series

Series	No. of tumors	Benign	Malignant
Foote *et al.*,[16] 1954	730	68.30%	31.70%
Skolnik *et al.*,[17] 1977	435	59340%	30.60%
Khazanchi *et al.*,[10] 1988	88	63.60%	36.40%
Renehan *et al.*,[12] 1996	1194	80.00%	0.00%
Present study	32	96.8%	3.1%

Table 21: Location of various tumors in different series

Series	Parotid	Submandibular	Sublingual
Budhraja *et al.*,[18] 1974	82.10%	12.40%	5.5%
Sharkey *et al.*,[19] 1977	80.50%	6.00%	9.0%
Everson *et al.*,[20] 1985	72.90%	10.70%	16.4%
Renehan *et al.*,[12] 1996	91.00%	4.0%	5%
Present study	100%	-	-

Table 22: Incidence of superficial and deep lobe involvement of parotid gland tumors in different series

Series	Total no. of cases	Superficial	Deep
H. Leverstein *et al.*, 1997[21]	245	192 (78.3%)	54 (22%)
H. Laccourreve *et al.*,[22] 1994	229	118 (51.5%)	111 (48.4%)
Present series	32	27 (88.46%)	5 (11.53%)

Table 23: Average age incidence of salivary gland tumors in different series

Series	Average age in years	
	Benign	Malignant
Potdar *et al.*,[8] 1969	40	49
Budhraj *et al.*,[18]1947	41	41
Skolnik *et al.*,[17]1977	45	56
Khazanchi *et al.*,[10] 1988	44	50
Renehan *et al.*[12] 1996	55	59
Present study	47	80

Table 24: FNAC comparison with pathologic diagnosis in different series

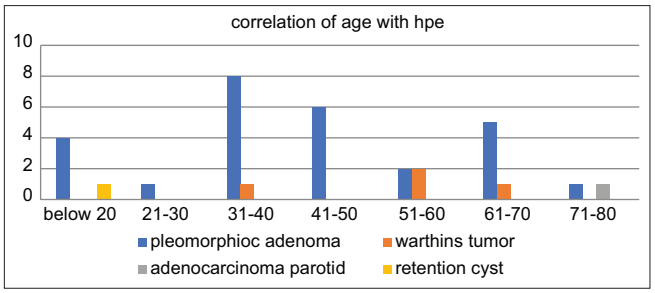
Series	Benign	Malignant
Frable and Frable, 1982[23]	91%	92%
Spiro *et al.*, 1974[24]	98%	93%
Present study	100%	100%

P value was found to be = 0.232 (>0.05) so not significant as represented in Table 5. Graph 2 shows the correlation of sex with hpe reports.

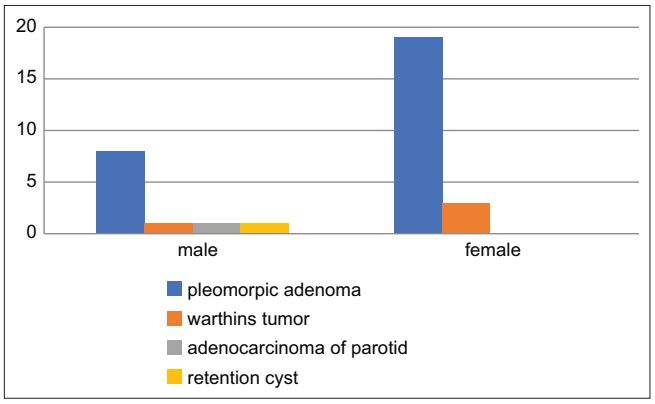
In our study, all cases presented with symptoms of swelling (100%), 52% (26) presented with pain. About 56% (28) presented with tenderness. Five cases were with deep lobe involvement (10%), 24 cases of ear lobe elevation (48%). Facial nerve paralysis occurred in 3 cases (6%) as shown in Table 6. Graph 3 below shows the various mode of clinical presentation.

In our study, 64% (32 cases) were found in the parotid gland, 28% of cases (14) in submandibular gland, and 8% of cases (4) in the sublingual gland as shown in Table 7 and Graph 4.

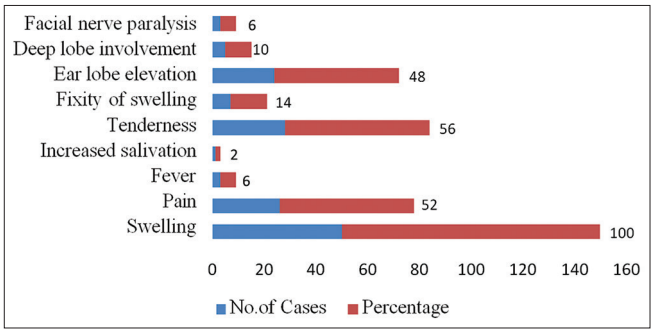
On the descriptive statistical analysis of gland involvement with HP reports, *P* value was found to be = to 0.000 (<0.01) highly significant. Therefore, correlation of gland involvement with HP reports was highly significant shown in Graph 5 and Table 8.



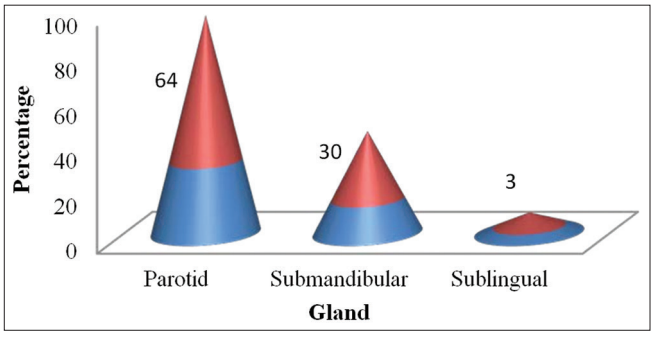
Graph 1: Age incidence with HPE



Graph 2: Correlation of sex with HPE reports

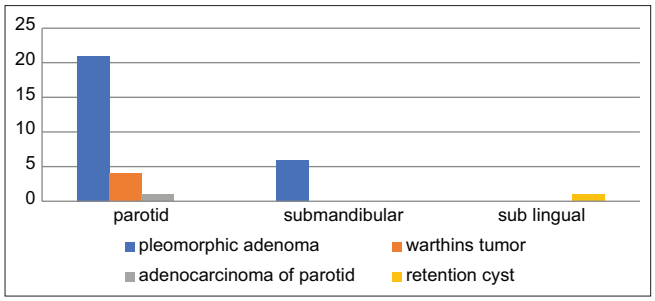


Graph 3: Mode of clinical presentation

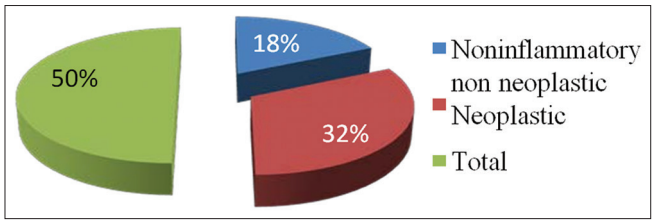


Graph 4: Sites of various salivary swellings

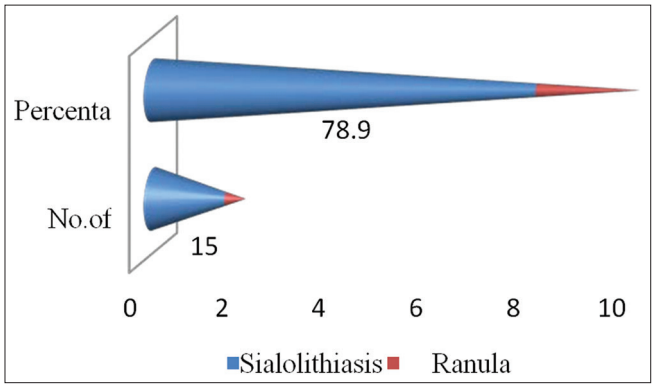
In our study, out of 50 cases, neoplastic lesions of 64.0% (32 cases) and non-inflammatory, non-neoplastic lesions of 36% (18 cases) were seen as shown in Table 9 and Graph 6.



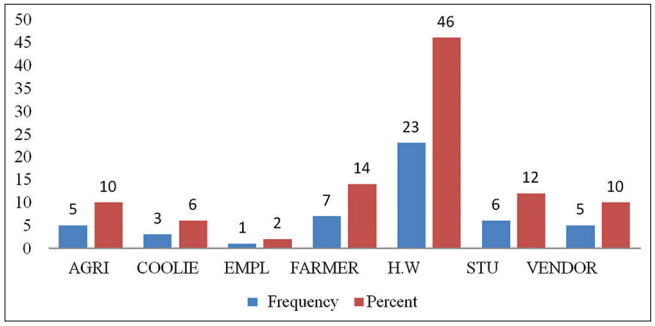
Graph 5: Correlation of site with HPE reports



Graph 6: Causes of salivary swellings



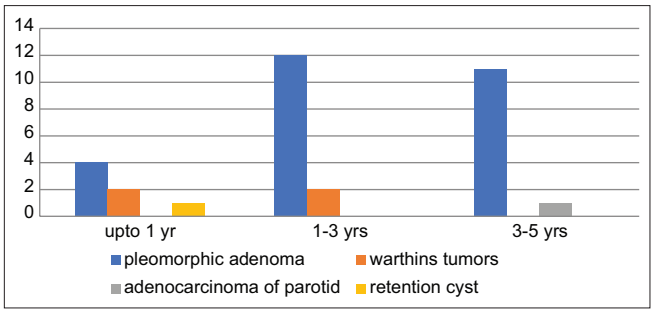
Graph 7: Incidence of non-inflammatory, non-neoplastic swelling



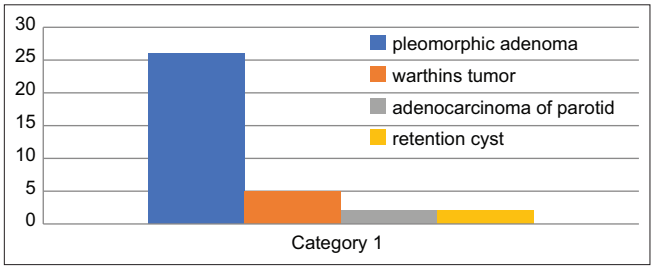
Graph 8: Occupation

In our study, out of 19 cases, 14 (78.9%) were sialolithiasis and 3 cases (21.1%) of sublingual ranula and one retention cyst as shown in Table 10 and Graph 7.

In our study, six cases of sialolithiasis were in the right submandibular gland, eight cases in the left submandibular gland, and four cases of ranula were seen in the right sublingual gland only as shown in Table 11.



Graph 9: Correlation of the duration of swelling in years with HPE reports



Graph 10: Correlation of clinical diagnosis with HPE reports

In our study, out of 32 salivary tumors, 93.75% (30) were benign and 6.25% (2) were malignant malignant as shown in Table 12.

In our study, out of 25 salivary gland tumors, pleomorphic adenoma was 84% (27), 14% (4) of Warthin tumor, and 1 case (2%) of adenoid cystic carcinoma as shown in Table 13.

In our study, the accuracy of FNAC was 100% in case of benign salivary gland tumors, for pleomorphic adenoma, Warthin tumor, and adenoid cystic Ca as shown in Table 14.

In our study, surgery was the treatment for all cases of tumors. Superficial parotidectomy was done in all the 26 cases of parotid tumor (52%) without deep lobe involvement and total parotidectomy was done in 5 cases (10%) with deep lobe involvement. In all the cases of submandibular gland lesions, excision of submandibular gland was done. Excision of the sublingual gland was done in three cases of ranula and one retention cyst excision as shown in Table 15.

Post-operative complications are my study of 50 cases which were low. Three cases of facial nerve paralysis occurred after parotid tumor surgery and wound infection was noticed in five cases. On correlation of occupation with HP reports P value = 0.458 (>0.05) and hence not significant as shown in Table 16.

On the bases of occupation, housewife was more commonly affected (46%) followed by farmers (14%). Least common were employees 2%.

On descriptive analysis of duration of swelling with HPE reports P value = 0.161 (>0.05) therefore not significant. On distributive analysis, 1–3 years swellings were common followed by 3–5 years. Up to 1 year was less common as shown in Graph 9.

On descriptive analysis of clinical diagnosis with HPE reports P value = 0.000 (<0.01) therefore highly significant. as shown in Graph 10 Therefore, there is a strong association between clinical diagnosis and HP reports.

DISCUSSION

Comparison of Our Present Series of 50 Cases with Various Series of Other Authors

In our series, mean incidence is 28 cases per year. This incidence correlates with most of studies by other authors as shown in Table 18.

In our study, incidence percentage of sialolithiasis, that is, 14 cases was found in submandibular gland which correlates with most of the authors in the above table series.

In accordance with the observation in other series, the benign tumors predominate in our study as shown in Table 20.

In our study, all the salivary gland tumors were observed in parotid gland. Comparative study was in accordance to Renehan *et al.* Tumors of sublingual glands are extremely rare and no cases were recorded with submandibular gland, because of small number of cases and short study period as shown in Table 21.

In our study, out of 32 parotid tumors, 27 (88.46%) were seen in superficial lobe of parotid and 5 (11.53%) in deep lobe which is in accordance with the Leverstein *et al.* series as shown in Table 22.

In our series of salivary gland tumors out of 32 cases, 31 cases were benign with mean age 45 and one case was malignant of 80 years age. The results observed in our study are consistent with other studies shown in the Table 23. In our study of 50 cases of salivary gland swelling, shows that, surgery is the treatment of choice in all cases of salivary gland swellings. FNAC plays an important role in the diagnosis of salivary gland tumors and accuracy rate was 100% in our series. In our study, there were no recurrence and nil mortality. Benign swelling of the salivary gland found in lower decade of life, whereas, malignant swelling was found in the 8th decade of life, which correlates with many authors in other series.

In our study of 50 cases, FNAC was in accordance with the other author's series shown in above Table 24.

CONCLUSION

Following the study of 50 cases of salivary gland swellings, the following conclusions can be made.

- Diagnosis of the salivary gland tumors must be considered in any patient presenting with salivary gland swelling
- Salivary gland swelling occur more commonly in the 3rd and 4th decades of life and seen most common in females
- Neoplastic salivary gland swellings were more common than non-inflammatory swellings.
- Sialolithiasis is the predominant non-inflammatory swelling.
- Sialolithiasis occurs more commonly in the submandibular salivary glands.
- Salivary gland tumors occur more commonly in the parotid gland, most often benign, pleomorphic adenoma constitute majority of all neoplasm
- History and physical examination complement FNAC and help in diagnosis. FNAC has good accuracy in diagnosing salivary gland swellings.
- Surgery is the main modality of treatment in salivary gland sialolithiasis. Most commonly done surgery is excision of submandibular salivary gland. Most commonly done surgery is superficial parotidectomy.
- Since the most malignant tumors are asymptomatic and long-standing benign tumors can undergo malignant change, community awareness and early referral are necessary, as prognosis is good if treated early.

SUMMARY

- The clinical material in this study includes the details of 50 cases of salivary gland swellings admitted in surgical units, surgical oncology of Osmania General Hospital and MNJ Cancer Hospital, Hyderabad, from December 2018 to November 2020.
- The incidence of salivary gland swellings is highest in the 3rd and 4th decade of life.

  Benign tumors were more common in 20–50 years and malignancy was seen in one patient of age 80 years.
- In this series, 17 patients were male (34%) and 33 (66%) patients were female, with male-to-female ratio of 1:1.9
- The most common salivary swellings were seen in parotid gland with 32 cases (64%)
- In this series, 18 cases (36 %) of salivary swellings were due to non-inflammatory and non-neoplastic swellings and 32 cases (64%) was due to neoplastic swellings.
- Incidence of non-inflammatory, non-neoplastic swellings was most often seen in submandibular salivary glands.

About 80% (14) were seen affecting the submandibular gland and 20% (4) were seen affecting the sublingual glands.

- Incidence of tumors was highest in the parotid. Incidence of benign tumors is 31 (96.8%) and malignant tumors are 1 (3.1%). Pleomorphic adenoma is the most common benign tumor and adenoid cystic carcinoma was the only malignant tumor.
- Patients presented with a history of swellings varying from 4 months to 5 years. Swelling is the most common symptom. Pain was the second most common symptoms. Pain was noticed in 52% of the cases and tenderness was noticed in 56% of the cases.
- Patient with malignant tumor had other symptoms in addition to the swelling, like pain, facial asymmetry due to facial nerve paresis.
- Final diagnosis was arrived at by physical examination and FNAC. FNAC is the reliable and sensitive tool for diagnosing salivary gland tumors. There was an overall diagnostic accuracy of 100%
- Surgery is the treatment in all the cases of salivary swelling. Out of 32 cases of parotid tumor, superficial parotidectomy was done in 28 cases (87.5%) and total parotidectomy for 4 cases (12.5%). For all the submandibular gland lesions, sialadenectomy was done. Sublingual gland excision was carried out for three cases of ranula and one retention cyst excision.
- Wound infection was the major complication with 5 cases (62.5%) and three cases of facial nerve paralysis (37.5%) were observed.
- Out of 50 cases, 18 cases (36%) were due to non-inflammatory and non-neoplastic swellings. Out of which, 14 cases (77.8%) were due to submandibular sialolithiasis and 3 cases (16.7%) were due to ranula of the sublingual glands and 1 (5.6%) case of sublingual retention cyst. Thirty-two cases (64%) were due to salivary gland tumors. Out of 32 tumors, pleomorphic adenoma is seen in 27 cases (84.4%), Warthin's tumor is seen in 4 cases (12.5%), and one case of adenoid cystic carcinoma (3.1%).
- With proper diagnosis and appropriate treatment, salivary gland swelling can be cured with almost 100%.
- Successful management of the salivary gland neoplasm depends on accurate clinical assessment and diagnosis, with appropriate use of fine-needle aspiration and computed tomography or magnetic resonance imaging. Moreover, knowledge of the particular behavior of each tumor type guides the development of an appropriate treatment plan for each individual patient.
- There was no mortality in our study of 50 cases after follow-up for 1 months–10 months. However, follow-up period was inadequate as salivary gland tumors are known for their late recurrence. The adequacy of treatment cannot be commented because of short period of follow-up.
- The study group in this series is small, as compared to large series in Western literature.

Hence, statistical data in this series may not represent the actual data quoted in Western literature.

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