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ORIGINAL ARTICLE

A Study of Clinicopathological Profile of Salivary Gland Swellings

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Abstract Salivary gland diseases usually present as a swelling of the affected gland. These lesions are commonly encountered in day to day practice. A salivary gland swelling can present in a variety of locations, depending on the salivary gland affected. The purpose of the study is to know the incidence of salivary gland swellings and the usefulness of FNAC in evaluating these swellings. The present study is a time bound prospective study of fifty consecutive cases of salivary gland swellings admitted in our hospital during the period November 2014–August 2016. Most of the patients underwent pre-operative work up with FNAC and patients indicated for surgery underwent surgery and HPE. Salivary gland swelling occurred more commonly in 3rd decade of life and equal number of cases were seen in both genders. Most of the patients presented with salivary gland swelling (98%). 21 (42%) were non neoplastic, 29 (58%) were neoplastic swellings, 18 (36%) were benign of which pleomorphic adenoma was the most common and 11 (22%) were malignant of which adenoid cystic carcinoma was the most common. Parotid gland was the most common gland involved. Fine needle aspiration cytology was highly sensitive for benign tumours and highly specific for malignant tumours. FNAC should be first choice of investigation in evaluating the salivary gland pathologies. Early diagnosis and subsequent appropriate management carries good prognosis.

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Introduction

Salivary glands are the exocrine organs for the production and secretion of saliva. There are three pairs of major salivary glands, the parotid, submandibular and sublingual glands. There are hundreds of minor salivary glands situated in the mucosal lining of the upper aerodigestive tract [1].

A mass in the region of the salivary glands presents a diagnostic challenge with regards to its site of origin, histological behaviour, and tissue diagnosis [2].

Fine needle aspiration cytology (FNAC) is an accurate, rapid, inexpensive, well tolerated investigation [3]. The superficial location of the salivary gland, easy accessibility and high diagnostic accuracy makes FNAC a popular method for evaluating them. Hence, the appropriate therapeutic management could be planned earlier, whether it is local excision for benign neoplasms, conservative management for non-neoplastic lesions, radical surgery for malignant tumours and chemotherapy or radiotherapy for metastasis [4].

Hence this study helps us to understand the clinical and pathological characteristics of the salivary gland swellings in our regional population, as limited studies have been conducted in Indian population.

Aim of the Study

To study the clinicopathological characteristics of salivary gland swellings.

Objectives of the Study

1. To know the incidence of non neoplastic and neoplastic salivary gland swellings.
2. To study the efficacy of FNAC in diagnosing salivary gland swellings.

Materials and Methods

This is a Prospective Hospital based study.

A total of 50 patients with features suggestive of salivary gland swellings from November 2014 to August 2016 were included in the study. Patients not willing for the study were excluded.

Results

In our study, non neoplastic swellings were seen more commonly in less than 50 years of age and pleomorphic adenoma was the most common benign tumor seen in less than 50 years. Warthin's tumor was the most common benign tumour in more than 50 years. In our study the malignant tumors were distributed equally in all age groups.

49 patients (98%) presented with swelling, 21 patients (42%) with pain, 5 each (10%) with trismus and fever and 2 (4%) with ulceration.

It was found that most common gland to be involved was parotid (64%).10% of the salivary gland swellings were of minor salivary gland origin. The frequency of occurrence of the various pathologies related to salivary gland swellings in our study showed 21 non neoplastic and 29 cases neoplastic. Among 29 neoplastic cases 18 were benign and 11 were malignant (Tables 1, 2).

Table 1 Distribution of salivary gland swellings according to age

Age (years)	Non neoplastic	Benign	Malignant
10–20	2	0	1
21–30	6	5	3
31–40	1	4	0
41–50	6	2	2
51–60	5	3	2
61–70	0	4	1
71–80	0	0	2
> 80	1	0	0
Total	21	18	11

Out of 50 patients 46 underwent FNAC and 4 cases were diagnosed clinically as acute inflammatory conditions associated with severe pain. The various pathological diagnosis based on FNAC is shown in Table 3.

Out of 46 patients who 'underwent FNAC, histopathology was available only in 42 patients, as rest of the cases were managed conservatively. Table 4 Shows pathological diagnosis based on histopathology.

In our study, out of 50 patients 46 underwent FNAC and only 42 patients underwent biopsy (Table 5).

The Sensitivity, specificity, PPV, NPV and Diagnostic accuracy of FNAC for non neoplastic lesions were 100, 93, 86.7,100 and 95.23%, respectively, and for neoplastic lesions, they were 93, 100, 100,86.7 and 95.23%, respectively (Table 6).

The Sensitivity, specificity, PPV, NPV and Diagnostic accuracy of FNAC for benign lesions were 94.4, 79.16, 77.3, 95 and 85.71%, respectively, and for malignant lesions, they were 45.5, 100, 100, 83.78 and 85.71%, respectively (Table 7).

Discussion

This study was conducted at a tertiary hospital from November 2014 to August 2016. The salivary gland swellings were classified as non neoplastic and neoplastic swellings which included benign and malignant tumours. The results thus obtained from the study were compared with studies done previously.

A total of 50 cases of salivary gland swellings were observed in the present study. 21 non-neoplastic and 29 neoplastic salivary gland swellings is compared.

Our study showed a male to female ratio of 1:1, similar to study done by Naz et al. [5].

The maximum incidence of salivary gland lesions was observed in 3rd decade of life followed by 5th and 6th decade. The results are similar to studies done by Ashraf et al. [6], where the commonest age group involved was 21–40.

In our study 64% of the swellings were from the parotid gland similar to studies done by Singh Nanda et al. [7], 26% were of the submandibular gland similar to study done by Ashraf et al. [6] and minor salivary gland accounted for 10% of the swellings similar studies done by Singh Nanda et al. [7] and Omhare et al. [8]. Our study correlates with all the above mentioned studies where the occurrence of salivary gland lesions are common in parotids followed by the submandibular glands and the minor salivary glands. We did not have any swellings involving the sublingual gland.

In our study the most common non neoplastic swelling was abscess and the most common malignant tumor was

Table 2 Distribution of salivary gland swellings based on pathology

	Number (%)	Non neoplastic	Neoplastic	
			Benign	Malignant
Parotid gland	32 (64)	11	14	07
Submandibular gland	13 (26)	10	01	02
Minor salivary glands	05 (10)	00	03	02
Total	50 (100)	21	18	11

Table 3 Diagnosis of salivary gland swellings based on FNAC

Type	FNAC	Percentage
Abscess	7	15.2
Adeno cystic carcinoma	1	2.17
Adeno carcinoma	2	4.3
Benign lympho epithelial cyst	1	2.17
Mucoepidermoid carcinoma	2	4.34
Pleomorphic adenoma	19	41.3
Parotitis	2	4.3
Sialedenitis	9	19.56
Sialolithiasis	1	2.17
Warthin's tumor	2	4.3
Total	46	100

Table 4 Diagnosis of salivary gland swelling based on histopathology

Type	Histopathology	Percentage
Abscess	5	11.9
Adeno carcinoma	2	4.7
Adenoid cystic carcinoma	4	9.5
Invasive carcinoma ex pleomorphic adenoma	1	2.4
Invasive squamous cell carcinoma	1	2.4
Mucoepidermoid carcinoma	1	2.4
Myoepithelioma	1	2.4
Pleomorphic adenoma	14	33.3
Sialadenitis	5	11.9
Sialadenitis with calculi	2	4.7
Salivary duct carcinoma	1	2.4
Sialolithiasis	1	2.4
Small cell carcinoma	1	2.4
Warthin's tumor	3	7.1
Total	42	100

adenoid cystic carcinoma unlike the results of other studies. But the commonest benign tumor was pleomorphic adenoma similar to all the studies [5, 9].

Out of 50 cases, 46 underwent FNAC and 4 cases were diagnosed clinically as acute inflammatory conditions

Table 5 Incidence of various salivary glands swellings (based on final diagnosis)

Pathology	Number	Percentage
Abscess	8	16
Adeno carcinoma	2	4
Adenoid cystic carcinoma	4	8
Invasive carcinoma ex pleomorphic adenoma	1	2
Invasive squamous cell carcinoma	1	2
Muco epidermoid carcinoma	1	2
Myoepithelioma	1	2
Pleomorhpic adenoma	14	28
Parotitis	3	6
Sialadenitis	5	10
Sialadenitis with calculi	2	4
Salivary duct carcinoma	1	2
Sialolithiasis	3	6
Small cell carcinoma	1	2
Warthin's tumor	3	6

Table 6 Diagnostic characteristics of FNAC for determining salivary gland disease

	Non neoplastic (%)	Neoplastic (%)
Sensitivity	100	93
Specificity	93	100
Positive predictive value	86.7	100
Negative predictive value	100	86.7
Diagnostic accuracy of the test	95.23	95.23

Table 7 Diagnostic characteristics of FNAC for determining benign and malignant neoplasm

	Benign (%)	Malignant (%)
Sensitivity	94.4	45.45
Specificity	79.16	100
Positive predictive value	77.3	100
Negative predictive value	95	83.78
Diagnostic accuracy of the test	85.71	85.71

associated with severe pain. Only 42 cases underwent HPE, rest of them were managed conservatively.

The Sensitivity, specificity, PPV, NPV and Diagnostic accuracy of FNAC for non neoplastic lesions were 100, 93, 86.7, 100 and 95.23%, respectively, and for neoplastic lesions, they were 93, 100, 100, 86.7 and 95.23%, respectively.

The Sensitivity, specificity, PPV, NPV and Diagnostic accuracy of FNAC for benign lesions were 94.4, 79.16, 77.3, 95 and 85.71%, respectively, and for malignant lesions, they were 45.5, 100, 100, 83.78 and 85.71%, respectively.

The overall sensitivity in detecting neoplastic lesion has ranged from 64 to 94.4, Our study has shown overall sensitivity of 93 which correlates well with most of the above mentioned studies [5, 9]. The overall specificity ranged from 80.95 to 99.5. Our study has a specificity of 100 percentage and correlates well with most of the

studies. The diagnostic accuracy in our study is 95.23 which correlates well with the other studies which have a diagnostic accuracy ranging from 73 to 95.3 [6].

The sensitivity of FNAC in detecting benign tumors was similar to study done by Ashraf et al. [6]. Whereas that for malignant tumors was similar to study done by Mallon et al. [10]. The specificity of FNAC in detecting benign tumors was similar to study done by Henry et al. [11]. Whereas that for malignant tumors was similar to study done by Liu et al. [12]. The diagnostic accuracy of FNAC in detecting benign and malignant tumors was similar to study done by Arshad et al. [13]. The positive predictive value of FNAC in detecting benign tumors was similar to study done by Mallon et al. [10]. The negative predictive value of FNAC in detecting benign tumors was similar to study done by Henry et al [11].

In our study, FNAC was highly sensitive in detecting benign tumors and highly specific for malignant tumors.

Conclusion

We conclude that males and females have equal predisposition to develop salivary gland diseases.

FNAC should be first choice of investigation in evaluating the salivary gland pathologies.

History and physical examination complement FNAC and help in diagnosis. FNAC is an accurate, simple, rapid, inexpensive investigation and well tolerated by the patient. Hence, the appropriate therapeutic management could be planned earlier, whether it is, conservative management for non-neoplastic lesions, surgery for tumours and radiotherapy and /or chemotherapy for metastasis.

The histopathological study of salivary gland neoplasms is complex and diverse. Histopathological examination is the gold standard method of diagnosis, predicting prognosis by typing, staging and grading in case of malignant neoplasms of salivary gland.

Diagnosis of the salivary gland tumors must be considered in any patient presenting with salivary gland swelling. Accurate diagnosis is essential as salivary gland neoplasms have diverse clinical and prognostic outcomes.

Since most malignant tumors are asymptomatic, and long standing benign tumors can undergo malignant change, community awareness and early referral is necessary, as prognosis is good if treated early.

Limitations of the Study

1. Small sample size, a bigger sample would yield a better result.
2. Short duration of study.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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