

**Role of FNAC in the Diagnosis of Salivary Gland Tumours**Naima Aziz<sup>1\*</sup>, Roop Rekha Das<sup>2</sup>, Antariksha Sharma<sup>3</sup>, Mayuri Saikia<sup>4</sup><sup>1</sup>Associate Professor, Department of Pathology, Gauhati Medical College and Hospital, Assam, India<sup>2</sup>Assistant Professor, Department of Pathology, Gauhati Medical College and Hospital, Assam, India<sup>3</sup>Demonstrator/Registrar, Department of Pathology, Gauhati Medical College and Hospital, Assam, India<sup>4</sup>Post Graduate Trainee, Department of Pathology, Gauhati Medical College and Hospital, Assam, India

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Conflict of interest: Nil

**Abstract:**

**Background:** Tumours of salivary gland constitute 1% to 5% of all head and neck tumours. Fine needle aspiration cytology (FNAC) is a cytodiagnostic method used for initial diagnosis of salivary gland swelling which is rapid, reliable, safe and inexpensive where individual or group of cells are studied to arrive at a pre-operative diagnosis. The aim of this study is to evaluate cytological spectrum of salivary gland tumours and its correlation with age, gender and anatomical site. We have done a retrospective study of FNAC of salivary gland tumours for a period of 1 year (2020-2021) in a tertiary care center of Northeast India.

**Results:** Out of 46 cases of salivary gland tumours, 65.2% were benign lesions and 34.8% malignant tumours. The majority of benign lesions were seen in the age group of 31 to 40 years. The male to female ratio of salivary gland lesions was 1.9:1 and parotid gland (65.2%) was found to be the most commonly involved site. Pleomorphic adenoma was the most common benign tumour (52.2%) and mucoepidermoid carcinoma was the most common malignant tumour (17.4%) among all the neoplasms.

**Conclusion:** Fine needle aspiration cytology is a rapid, cost-effective, and safe diagnostic procedure useful in the initial preoperative diagnosis of salivary gland tumours to plan for appropriate treatment. However, it should be correlated with histopathological confirmation.

**Keywords:** FNAC, Mucoepidermoid Carcinoma, Pleomorphic Adenoma, Retrospective Study, Salivary Gland.

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**Introduction**

1% to 5% of all head and neck tumours are salivary gland tumours. Out of these, 75%-85% are seen in the major part of the salivary gland and 10-20% in the minor salivary gland with a ratio of 5:1[1]. Fine needle aspiration cytology is a cost effective, rapid method with overall good patient compliance and helpful in the initial preoperative diagnosis of salivary gland lesions to plan for appropriate treatment [2].

**Aims and Objectives**

1. To assess cytological spectrum of salivary gland tumours.
2. Correlation of FNAC with gender, age and anatomical site.

**Materials and Methods**

A 1 year retrospective study was carried in a tertiary care hospital of Assam (September 2020 to 2021)

A total of 46 cytosmears from salivary gland lesions fulfilling our inclusion and exclusion

criteria were taken in the study period. Following routine protocol, these smears were then fixed in 95% isopropyl alcohol and stained with May Grunwald-Giemsa stain and Papanicolaou stain.

Out of 46 cases, 22 cases of resected specimens were received in the department of Pathology for histopathological examination. Formalin fixed specimens were processed following routine protocol and stained with Haematoxylin and Eosin stain.

**Inclusion criteria**

- All the satisfactory FNAC smears of salivary gland tumours during the study period.
- Patients of all age groups and both genders were included in this study.

**Exclusion criteria**

Inadequate samples with cellular material for cytological diagnosis were excluded from this study.

**Results**

**Table 1: Distribution of salivary gland tumours**

Procedure	Benign	Malignant	Total no of cases
FNAC	30	16	46
Histopathology	12	10	22

30 cases (65.2%) were benign lesions and 16 cases (34.8%) were malignant lesions in cytological evaluation.

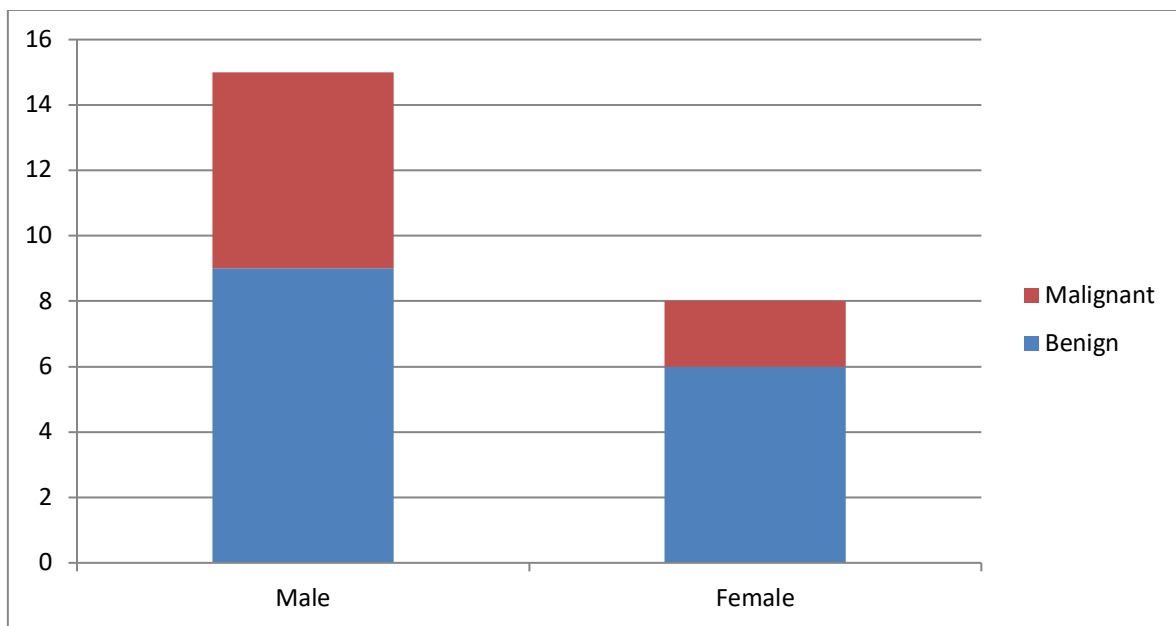
**Table 2: Age wise distribution of salivary gland tumours**

Age (years)	Benign	Malignant
10-20	2(6.6%)	0
21-30	4(13.4%)	2(12.5%)
31-40	10(33.4%)	0
41-50	6(20%)	2(12.5%)
51-60	4(13.4%)	4(25%)
61-70	2(6.6%)	6(37.5%)
71-80	2(6.6%)	2(12.5%)
Total	30	16

Majority (33.4%) of benign salivary gland tumours were seen in the age group of 31 to 40 years while the majority of malignant lesions (37.5%) were seen in the age group of 61-70 years.

**Table 3: Gender wise distribution of salivary gland tumours**

Gender	Benign	Malignant	Total
Male	18	12	30
Female	12	4	16
Total	30	16	46

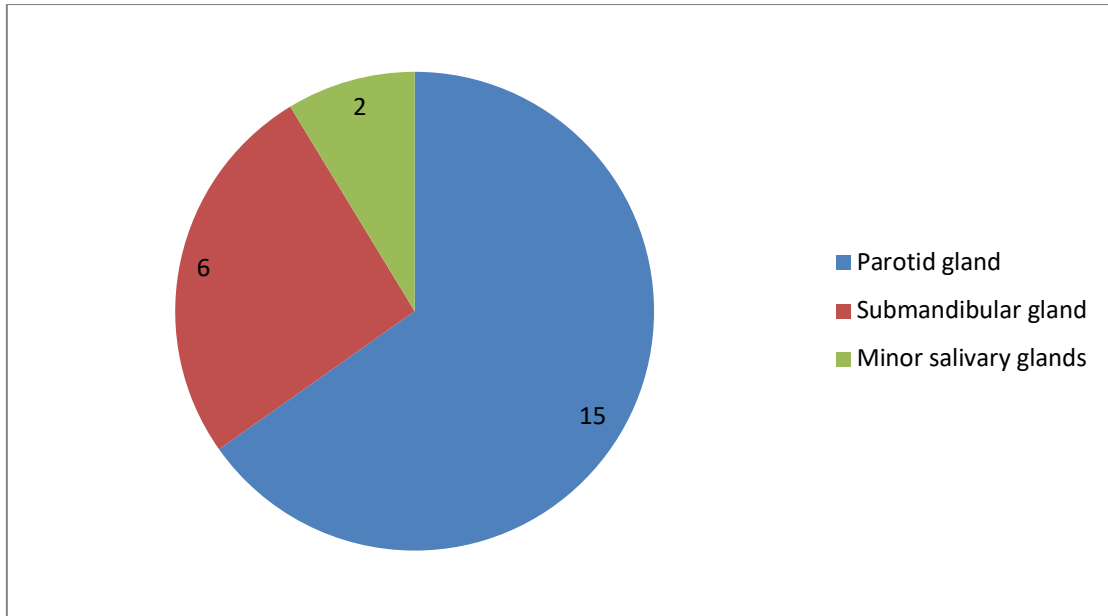


**Figure 1: Gender wise distribution of cases**

The male to female ratio of salivary gland lesions was 1.9:1 with slight male preponderance.

**Table 4: Distribution according to site**

Anatomical site	No of cases	Percentage
Parotid gland	30	65.2%
Submandibular gland	12	26.1%
Minor salivary glands	04	8.7%
Total	46	100%



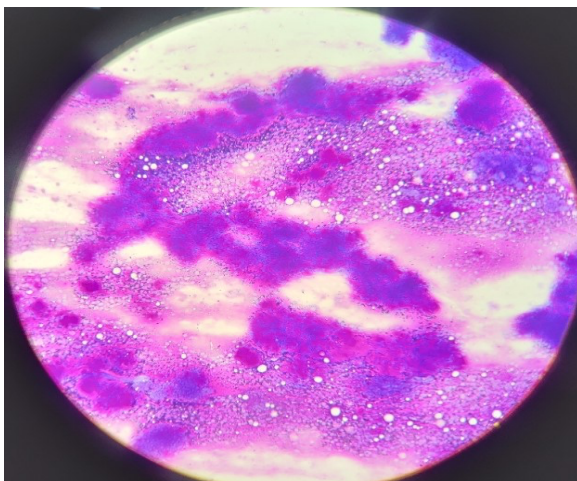
**Figure 2: Site wise distribution of cases**

Parotid gland (65.2%) was the most commonly involved site followed by submandibular gland (26.1%).

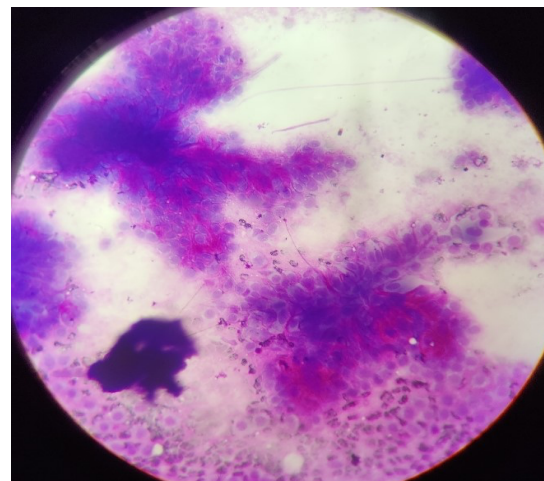
**Table 5: Cytological spectrum of salivary gland lesion**

Categories	Cytological diagnosis	No of cases	Percentage
Benign	Pleomorphic adenoma	24	52.2%
	Warthins tumour	4	8.7%
	Schwannoma	2	4.3%
Malignant	Mucoepidermoid carcinoma	8	17.5%
	Adenoid cystic carcinoma	4	8.7%
	Acinic cell carcinoma	2	4.3%
	Suspicious for malignant cells	2	4.3%

Among the benign tumours of salivary gland in the present study, pleomorphic adenoma was the most common tumour comprising 52.2% of all neoplasms followed by warthins tumour. Out of 8 cases of malignant tumours, mucoepidermoid carcinoma was most common followed by adenoid cystic carcinoma.



**Figure 3: Low power view of pleomorphic adenoma showing abundant chondromyxoid stroma (100X)**



**Figure 4: High power view of pleomorphic adenoma showing epithelial cells embedded in fibrillary stroma (400X)**

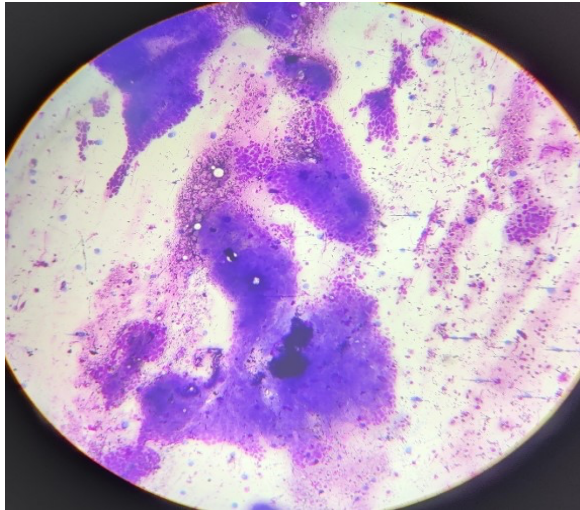


Figure 5: Low power view of mucoepidermoid Carcinoma (100X)

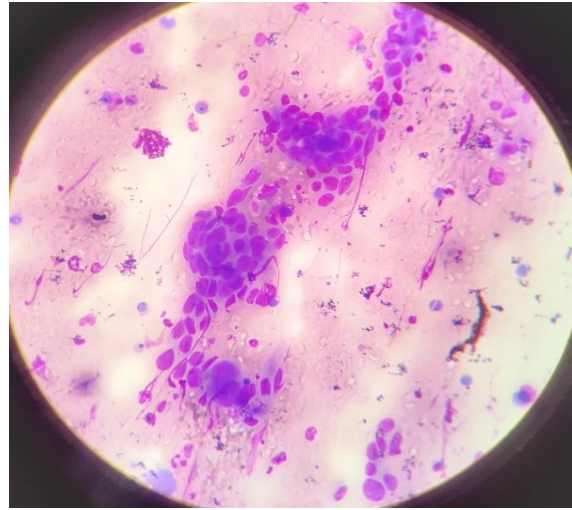


Figure 6: High power view of mucoepidermoid carcinoma (400X)

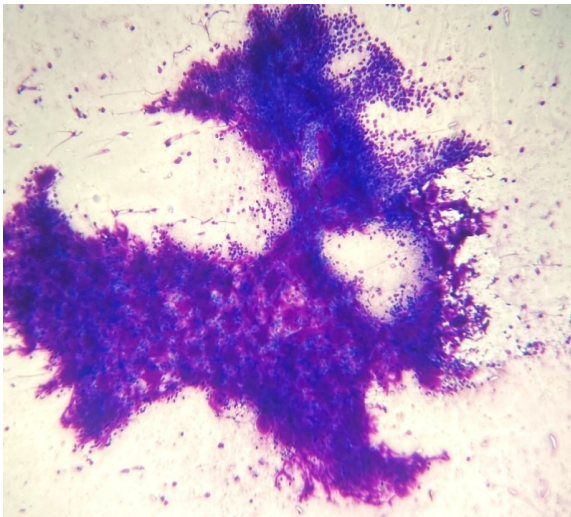


Figure 7: Low power view (100X) of carcinoma adenoid cystic carcinoma.

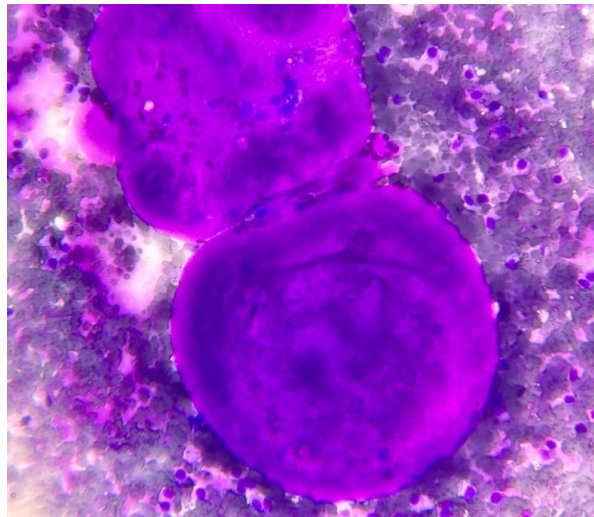


Figure 8: High power view of adenoid cystic Showing hyaline globules (400X)

**Discussion**

FNAC is a cost effective, rapid and useful diagnostic procedure. It helps the surgeon in deciding the plan of surgery and early treatment. In the present study, the age range was 10 to 80 years with a mean age of 42.9 years. Male to female ratio was 1.9:1. Other studies conducted by R. Gupta et al[3] , Omhare et al[4] and Choudhury et al[5] are concordant with our study.

Study	Mean age (years)	M:F
R. Gupta et al	35.7	1.18:1
Omhare et al	40	1.17:1
Choudhury et al	42	1.4:1
<b>Present study</b>	<b>42.9</b>	<b>1.9:1</b>

In the present study, the most common site involvement was parotid gland with a frequency of 65.2%, which is concordant with other studies done by Ito et al [7], Sandhu VK et al[6], I Alsanie et al[9], Tahoun N et al[10]

Study	Parotid gland
Ito et al	67.7%
Sandhu VK et al	65%
I Alsanie et al	70%
Tahoun N et al	68.3%
<b>Present study</b>	<b>65.2%</b>

In the current study, among benign tumours of salivary gland, Pleomorphic adenoma was the most

common tumour comprising 52.2% of all neoplasms.

This is concordant with other study done by Ito et al [7], who reported the incidence of Pleomorphic adenoma as 54.2%. Warthins tumour was seen in 8.7% of all neoplasm, which is in concordance with other study done by Shetty A et al [8] with 10.7% of cases. In the present study, Mucoepidermoid carcinoma was the most common malignant tumour

comprising of 17.5% followed by adenoid cystic carcinoma constituting 8.7% of all neoplasms.

These are concordant with other studies done by Ito et al [7], I Alsanie et al [9]. However, some studies have found adenoid cystic carcinoma was the most common malignant tumour followed by mucoepidermoid carcinoma.

Study	Mucoepidermoid carcinoma	Adenoid cystic carcinoma
Ito et al	13.5%	7.9%
I Alsanie et al	26%	17%
<b>Present study</b>	17.5%	8.7%

### Conclusions

Fine needle aspiration cytology is a rapid, cost-effective, and safe diagnostic procedure for the primary categorization of salivary gland lesions into non-neoplastic, benign and malignant lesions.

It can be used as a first-line investigation to evaluate patients with various salivary gland lesions. However, histopathological diagnosis remains the gold standard.

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