

# Role of FNAC in the Diagnosis of Salivary Gland Lesions

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**Abstract:** Background: Salivary gland tumours account for 1% to 5% of all head and neck tumours. Fine needle aspiration cytology (FNAC) is used as an initial diagnostic tool for salivary gland swelling. The aim of this study is to evaluate cytological spectrum of salivary gland lesions and its correlation with age, gender and anatomical site. We have done a retrospective study of FNAC for salivary gland lesions for a period of 1 year (2020 - 2021) in a tertiary care center of Northeast India. Results: Out of 47 cases of salivary gland lesions, we have found 51.1% non - neoplastic lesions, 31.2% benign lesions and 17% malignant tumours. The majority of the salivary gland lesions were seen in the age group of 51 to 60 years. The male to female ratio of salivary gland lesions was 1.4: 1 and parotid gland (68.08%) 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 lesions to plan for appropriate treatment. However, it should be correlated with histopathological confirmation.

**Keywords:** FNAC, mucoepidermoid carcinoma, pleomorphic adenoma, retrospective study, salivary gland

## 1. Introduction

Salivary gland tumours are reported to present between 1% to 5% of all head and neck tumours. Of these, 75% - 85% are found in the major salivary gland and 10 - 20% in the minor salivary gland with a ratio of 5: 1<sup>(1)</sup>. Fine needle aspiration cytology is rapid, cost effective with overall good patient compliance and useful in the initial preoperative diagnosis of salivary gland lesions to plan for appropriate treatment<sup>(2)</sup>.

### Aims and Objectives

- 1) To evaluate cytological spectrum of salivary gland lesions.
- 2) To correlate with age, gender and anatomical site.

## 2. Materials and Methods

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

A total of 47 cytosmears from salivary gland lesions were found in the study period. These smears were fixed in 95% isopropyl alcohol and stained with May Grunwald - Giemsa stain.

Out of 47 cases, only 11 cases of resected specimens were received in the department of Pathology for histopathological examination. Formalin fixed specimens were processed routinely and stained with Haematoxylin and Eosin.

### Inclusion criteria

- All the FNAC smears of salivary gland lesions during the study period.
- Patients of all age groups and both sexes were included.

### Exclusion criteria

- Inadequate cellular material for cytological diagnosis.
- Patients who have not given consent for the study.

## 3. Results

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

Procedure	Non neoplastic	Benign	Malignant	Total no of cases
FNAC	24	15	8	47
Histopathology	1	6	4	11

In our study, we have found 51.1% non - neoplastic lesions (24 cases out of 47 cases), 31.9% of benign lesions (15 cases out of 47 cases) and 17% malignant tumours (8 cases out of 47 cases).

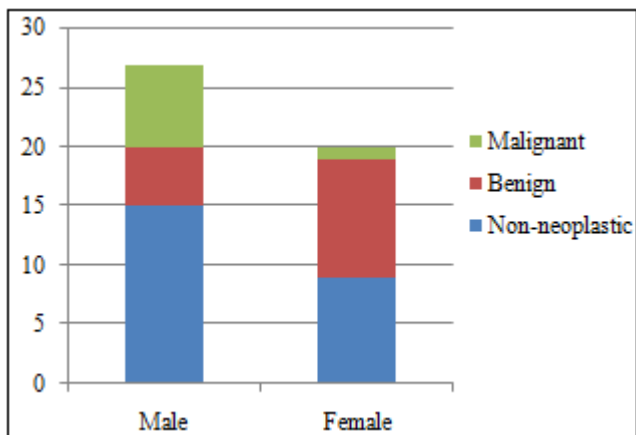
**Table 2:** Age wise distribution of salivary gland lesions

Age (years)	Non neoplastic	Benign	Malignant
0 - 10	1	0	0
11 - 20	3	1	0
21 - 30	0	2	1
31 - 40	4	5	0
41 - 50	4	3	1
51 - 60	7	2	2
61 - 70	2	1	3
71 - 80	3	1	1

In the present study, the majority of the salivary gland lesions were seen in the age group of 51 to 60 years followed by 31 to 40 years. The malignant lesions were seen in the age group >60 years.

**Table 3:** Sex wise distribution of salivary gland lesions

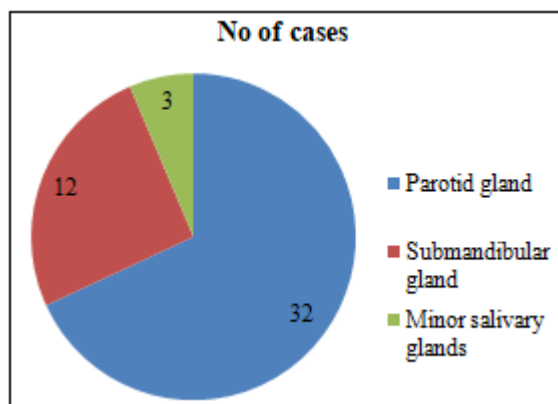
Gender	Non neoplastic	Benign	Malignant
Male	15	5	7
Female	9	10	1



The male to female ratio of salivary gland lesions was 1.4: 1 with slight male predominance.

**Table 4:** Distribution of salivary gland lesions according to site

Anatomical site	No of cases	Percentage
Parotid gland	32	68.08%
Submandibular gland	12	25.53%
Minor salivary glands	03	6.39%
Total	47	100%



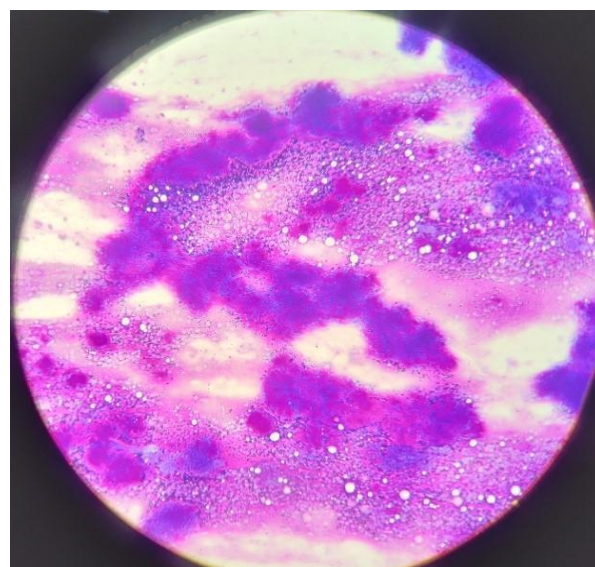
It was observed in the current study that parotid gland (68.08%) was the most commonly involved site followed by submandibular gland (25.53%).

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

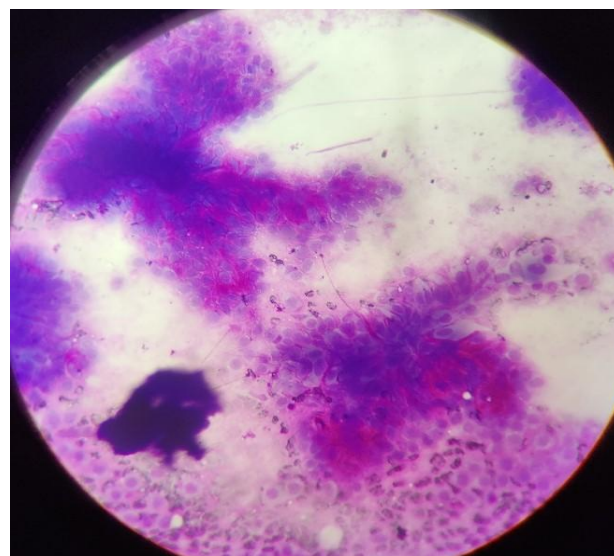
Categories	Cytological diagnosis	No of cases	Percentage
Non neoplastic	Sialadenitis	11	23.4%
	Sialadenosis	8	17%
	Benign cystic lesion	5	10.7%
Benign	Pleomorphic adenoma	12	25.5%
	Warthins tumour	2	4.3%
	Schwannoma	1	2.1%
Malignant	Mucoepidermoid carcinoma	4	8.5%
	Adenoid cystic carcinoma	2	4.3%
	Acinic cell carcinoma	1	2.1%
	Suspicious for malignant cells	1	2.1%

Among 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 commonly found followed by adenoid cystic carcinoma.

**Case Photographs**

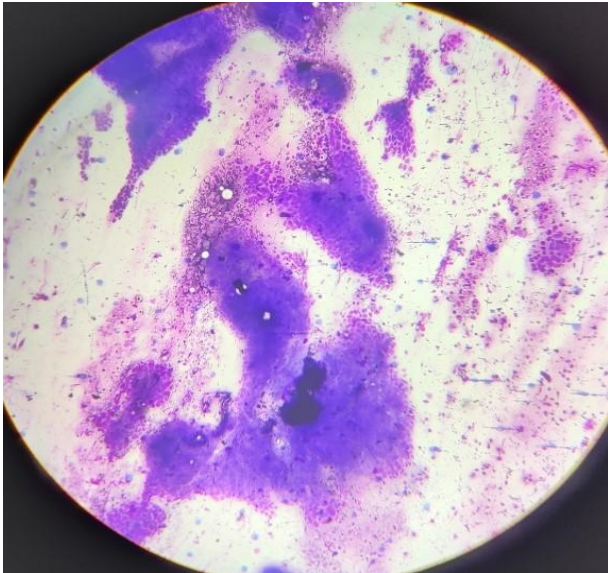


Low power view of pleomorphic adenoma showing abundant chondromyxoid stroma

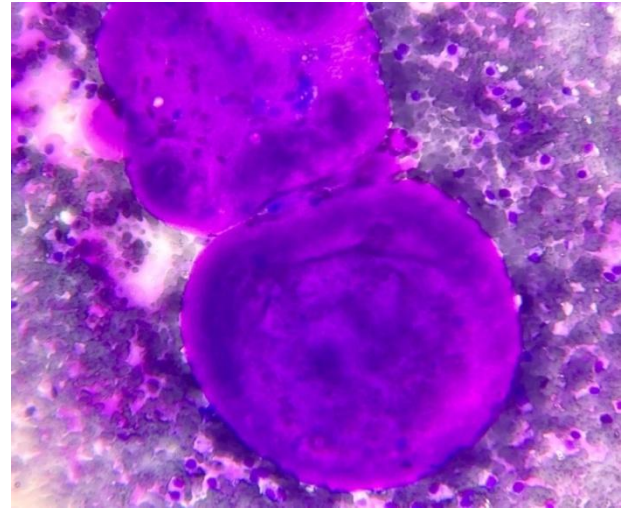


High power pleomorphic adenoma showing epithelial cells embedded in a fibrillary chondromyxoid stroma

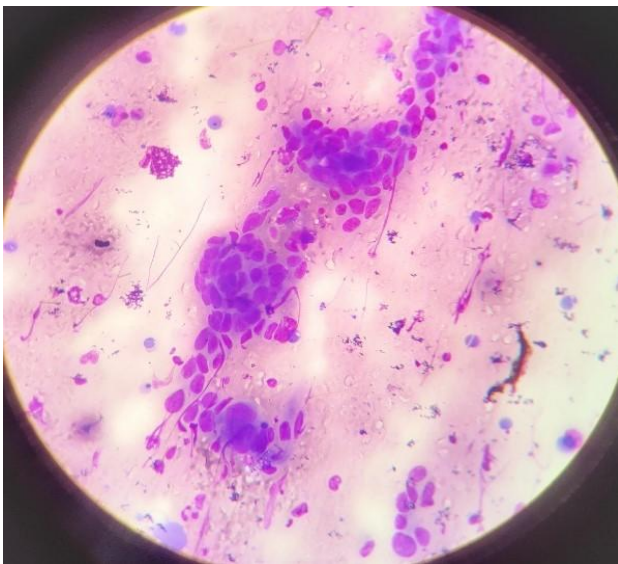




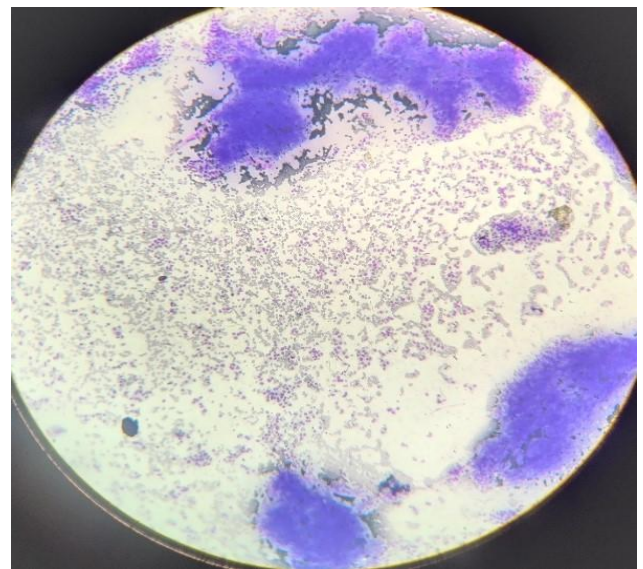
Low power view of mucoepidermoid carcinoma



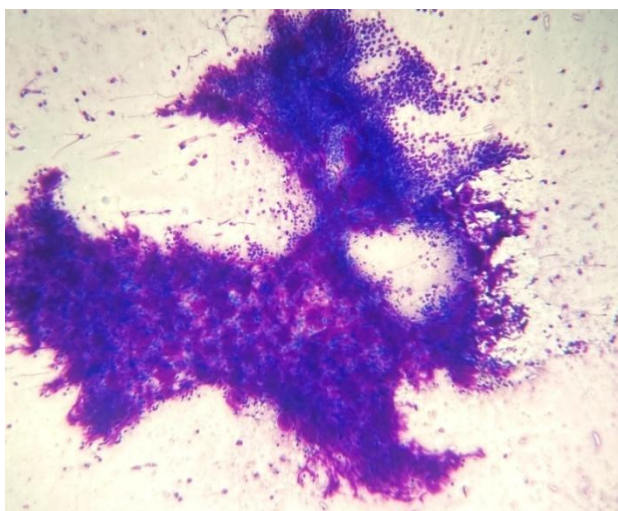
High power view of adenoid cystic carcinoma showing hyaline stromal globules



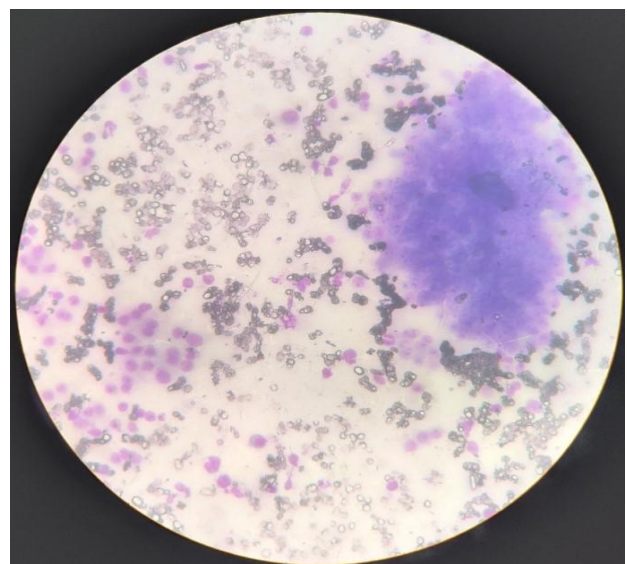
High power view of mucoepidermoid carcinoma showing poorly cohesive malignant squamous epithelial cells



Low power view of acinic cell carcinoma



Low power view of adenoid cystic carcinoma



High power view of acinic cell carcinoma showing cells with oncocytic like cytoplasm and many naked nuclei

#### 4. Discussion

FNAC is a simple, cost effective and useful diagnostic procedure. It helps the surgeon in planning the extent of surgery. In the present study, the age range is of 10 to 80 years with a mean age of 42.9 years. Males were more in number as compared to females. Other studies conducted by R. Gupta et al<sup>(3)</sup>, Omhare et al<sup>(4)</sup> and Choudhury et al<sup>(5)</sup>

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>1.4: 1</b>

In the present study, the most common site involvement was parotid gland with a frequency of 68.08%, which is concordant with other studies done by Ito et al<sup>(8)</sup>, Sandhu VK et al<sup>(6)</sup>, I Alsanie et al<sup>(10)</sup>, Tahoun N et al<sup>(11)</sup>

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>68.08%</b>

In the current study, non neoplastic lesions constituted 51.1%. Studies conducted by Sandhu VK et al<sup>(6)</sup>, Divija K et al<sup>(7)</sup>

Study	Non neoplastic lesion (%)
Sandhu VK et al	46.66%
Divija K et al	50.78%
<b>Present study</b>	<b>51.1%</b>

Among benign tumours of salivary gland, Pleomorphic adenoma was the most common tumour comprising 52.17% of all neoplasms. This is concordant with other study done by Ito et al<sup>(8)</sup>, who reported the incidence of Pleomorphic adenoma as 54.2%. Warthin tumour was seen in 8.7% of all neoplasm, which is in concordance with other study done by Shetty A et al<sup>(9)</sup> with 10.7% of cases.

In the present study, Mucoepidermoid carcinoma was the most common malignant tumour comprising of 17.39% followed by adenoid cystic carcinoma constituting 8.69% of all neoplasms. These are concordant with other studies done by Ito et al<sup>(8)</sup>, I Alsanie et al<sup>(10)</sup>. 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>	<b>17.39%</b>	<b>8.69%</b>

#### 5. 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.

#### References

- [1] Sardar MA, Ganvir S M, Hazarey V K. A demographic study of salivary gland tumors. *SRM J Res Dent Sci* 2018; 9: 67 - 73.
- [2] Singh A, Haritwal A, Murali BM. Correlation between cytology and histopathology of the salivary gland. *AMJ* 2011, 4, 2, 66 - 71
- [3] Gupta R, Dewan D, Kumar D, Suri J, Fine - needle aspiration cytology (FNAC) of salivary gland lesions with histopathological correlation in a district hospital of Jammu region. *Indian J Pathol Oncol* 2016; 3 (1): 32 - 37
- [4] Anita Omhare, Sanjeev Kumar Singh, Jitendra Singh Nigam, Ankit Sharma, "Cytohistopathological Study of Salivary Gland Lesions in Bundelkhand Region, Uttar Pradesh, India", *Pathology Research International*, vol.2014, Article ID 804265, 5 pages, 2014.
- [5] A. A. Choudhury, T. Sultana, B. H. Siddique, and A. S. A. Amin, "Diagnosis of parotid gland mass by the fine needle aspiration cytology (FNAC) and its histopathological correlation—2 years study in BSMMU, Dhaka, " *Bangabandhu Sheikh Mujib Medical University Journal*, vol.4, no.2, pp.65–69, 2011.
- [6] Sandhu VK, Sharma U, Singh N, Puri A. Cytological spectrum of salivary gland lesions and their correlation with epidemiological parameters. *J Oral Maxillofac Pathol.*2017 May - Aug; 21 (2): 203 - 210. doi: 10.4103/jomfp. JOMFP\_61\_17. PMID: 28932028; PMCID: PMC5596669.
- [7] Journals, IOSR. "A Study on Cytological Spectrum of Salivary Gland Lesions with Histological Correlation in a Tertiary Care Institute. " *IOSR Journals* , 2019. doi: 10.9790/0853 - 1803080609.
- [8] Ito FA, Ito K, Vargas PA, de Almeida OP, Lopes MA. Salivary gland tumors in a Brazilian population: a retrospective study of 496 cases. *Int J Oral Maxillofac Surg.*2005 Jul; 34 (5): 533 - 6. doi: 10.1016/j.ijom.2005.02.005. PMID: 16053874.
- [9] Shetty A, Geethamani V. Role of fine - needle aspiration cytology in the diagnosis of major salivary gland tumors: A study with histological and clinical correlation. *J Oral Maxillofac Pathol.*2016 May - Aug; 20 (2): 224 - 9. doi: 10.4103/0973 - 029X.185899. PMID: 27601813; PMCID: PMC4989551.
- [10] Alsanie, I., Rajab, S., Cottom, H. *et al.* Distribution and Frequency of Salivary Gland Tumours: An International Multicenter Study. *Head and Neck Pathol* **16**, 1043–1054 (2022).
- [11] Tahoun N, Ezzat N. Diagnostic accuracy and pitfalls of preoperative fine needle aspiration cytology in salivary gland lesions. *J Egypt Natl Canc Inst.*2008 Dec; 20 (4): 358 - 68. PMID: 20571594.