

**FNAC-based Cytomorphological Spectrum of Salivary Gland Lesions:  
A Retrospective Study in a Tertiary Care Centre in Chhattisgarh**

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**ABSTRACT**

**Introduction:** Salivary gland accounts for 6.5% of all lesions belonging to Head and Neck region with almost 40% being neoplastic. Swelling of the salivary glands can result from inflammation, cysts, or neoplasms. Fine Needle Aspiration (FNA) serves as a straightforward, economical, dependable, and minimally invasive method widely employed for the preoperative diagnosis of salivary gland lesions. It offers valuable insights to facilitate the planning of suitable management strategies. The current investigation seeks to assess the cytomorphological spectrum of salivary gland lesions conducted within a specified timeframe at our institution.

**Materials & Methods:** This retrospective observational study took place in the Cytology section of the Pathology Department at our institute over a one-year duration, utilizing FNAC as a diagnostic tool following established protocols. Patient slides and clinical records were collected, and observations were documented.

**Results:** During a year, a total of 49 instances of salivary gland lesions were aspirated. The age of the patients varied between 16 and 75 years, with an average age of 46.5 years. The male-to-female ratio was 1.4:1. The Parotid Gland was the most frequently involved salivary gland, accounting for 67.3% of cases. Among the cases, 59.1% were classified as non-neoplastic lesions, while 40.9% were identified as neoplastic lesions. In the non-neoplastic category, Chronic Sialadenitis was the most prevalent, whereas Pleomorphic Adenoma and Mucoepidermoid Carcinoma were the most common benign and malignant neoplastic lesions, respectively, in this study.

**Conclusion:** FNA cytology emerges as a secure, efficient, and reasonably precise method for assessing salivary gland lesions. It furnishes valuable insights into the management of such lesions and aids in identifying malignancies. This technique plays a crucial role in determining the appropriate surgical approach, minimizing the risk of unnecessary surgery for nonneoplastic lesions.

**Keywords:** Fine-needle aspiration cytology, salivary gland lesions, neoplastic, non-neoplastic, sialadenitis

## INTRODUCTION:

Salivary glands are classified as exocrine glands, responsible for generating, altering, and releasing saliva into the oral cavity. Major salivary glands consist of the Parotid gland, Submandibular gland, and Submental gland. On the other hand, a multitude of Minor salivary glands can be observed, distributed along the mucosa of the mouth and upper aerodigestive tract <sup>[1]</sup>. Salivary gland neoplasms comprise of 6.5 % of all head and neck lesions amongst which 21-46% are malignant. [2] Fine Needle Aspiration Cytology is being employed for preoperative diagnosis of salivary glands due to easy accessibility and superficial nature of the glands. FNAC is considered to be a simple, minimally invasive, accurate and quick technique used in evaluation of salivary gland lesions preoperatively, hence playing a crucial role in their management.<sup>[3]</sup>

## MATERIAL AND METHODS:

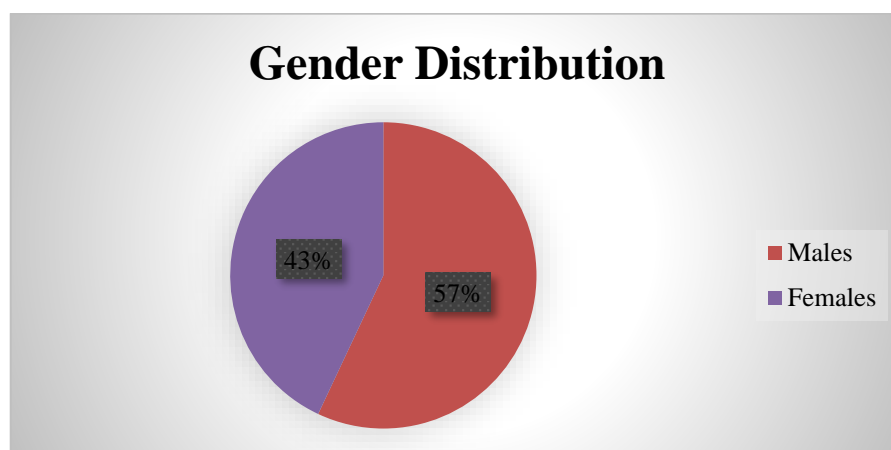
- Place: The study was conducted in the Cytology section of Department of Pathology of tertiary care hospital.
- Duration: Period of 1 year from Jan 2022 to Jan 2023
- Study Type: Retrospective Observational Study
- Sampling Method: All patients with suspected salivary gland lesions referred to cytological examination were selected.
- Inclusion Criteria: Patients with superficial, palpable and nodular lesions of salivary glands which yielded adequate aspirate were included.
- Exclusion Criteria: Patients with scanty or hemorrhagic aspirate after repeated attempts were excluded.
- Data Collection: Total 49 patients with suspected salivary gland lesions underwent FNAC in our department during the study period. The clinical data pertaining to patient's age, gender, anatomical site, radiology reports were retrieved from the records followed by re-examination of FNAC smears.

- **Data Analysis:** The collected data was entered in Microsoft Excel spreadsheet and analyzed statistically and reported in terms of percentage, frequency, tables and graphically wherever required.

## RESULTS:

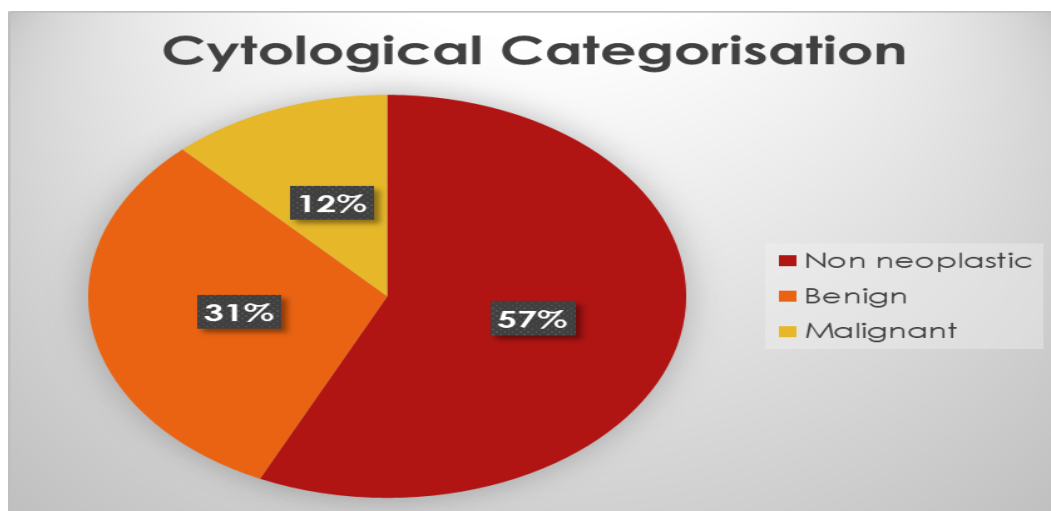
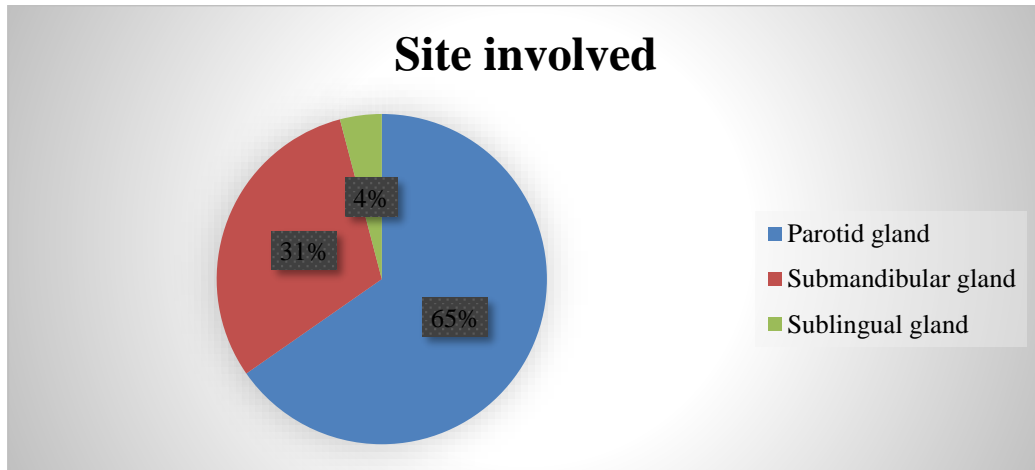
In the present study, 49 cases were studied out of which 28 patients were males and 21 patients were females, making **male:female 1.3:1** The maximum number of cases were in age group **41-50 yrs** followed by 21-30 yrs. Age of patients ranged from 14-75years, **mean age being 46.5yrs.**

Age (years)	Number of Cases
0-10	0
11-20	5
<b>21-30</b>	<b>11</b>
31-40	8
<b>41-50</b>	<b>14</b>
51-60	6
61-70	4
71-80	1



- The most common site of involvement was **Parotid gland** with a frequency of 65.3% cases (32/49) followed by Submandibular gland 30.61% cases (15/49) and sublingual glands in 4.08% cases (2/49).

- Most common lesion was **Non neoplastic type** accounting for 57.14% cases (28/49) followed by Benign tumors 30.61% cases (15/49). Malignant tumors were diagnosed in 12.24% cases (6/49).

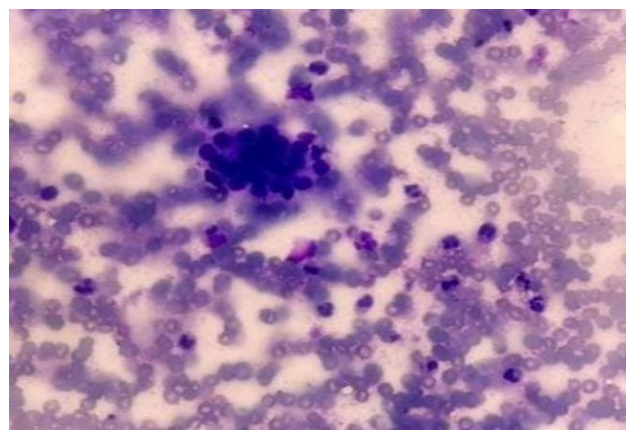
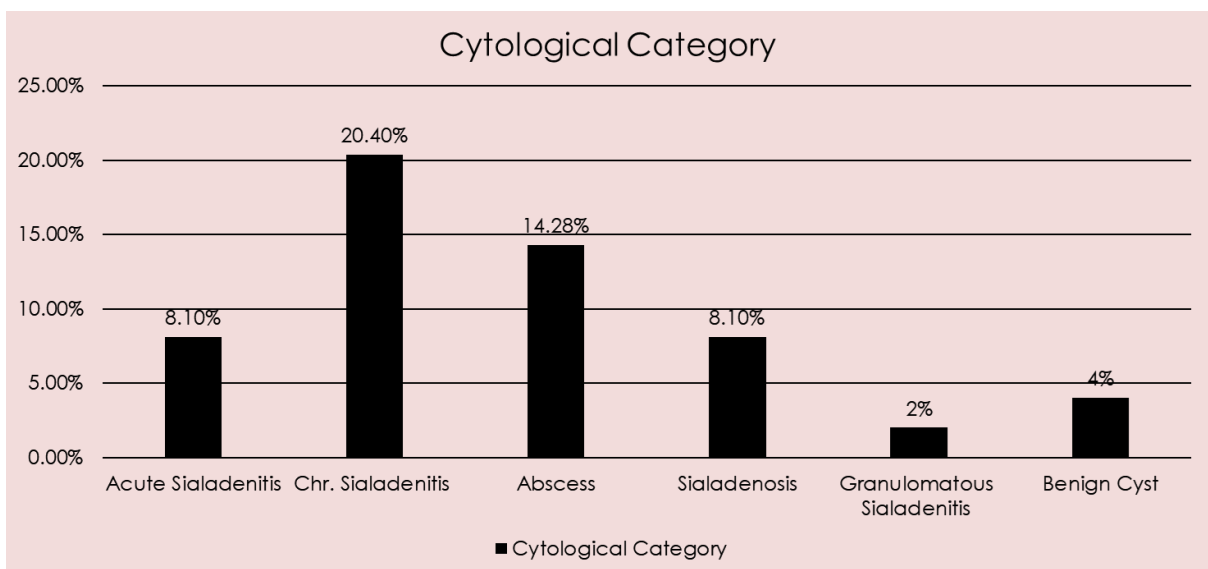


Type of lesion	Parotid gland	Submandibular gland	Submental gland	No of cases	Male	Female
Acute Sialadenitis	2	1	1	4	2	2
Chronic Sialadenitis	7	2	1	10	6	4
Granulomatous Sialadenitis	1	0	0	1	1	0
Sialadenosis	4	1	0	4	3	1
Abscess	3	3	0	7	3	4
Benign cyst	1	1	0	2	1	1
Pleomorphic adenoma	6	2	0	8	3	5
Warthin’s tumour	2	1	0	3	2	1
Oncocytoma	0	1	0	1	1	0

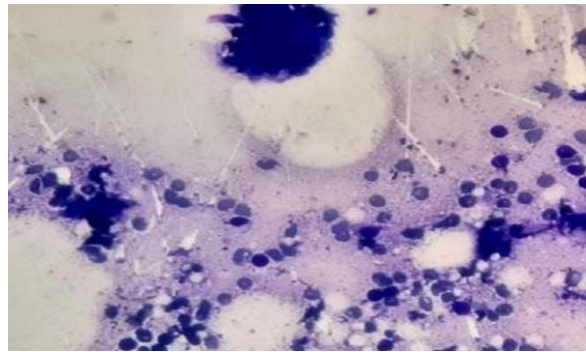
Shwannoma	2	0	0	2	1	1
Basal cell adenoma	0	1	0	1	1	0
Mucoepidermoid Ca	2	1	0	3	2	1
Adenoid cystic Ca	2	0	0	2	1	1
Poorly differentiated Ca	0	1	0	1	1	0
<b>Total</b>	<b>32</b>	<b>15</b>	<b>2</b>	<b>49</b>	<b>28</b>	<b>21</b>

**Non neoplastic lesions: -**

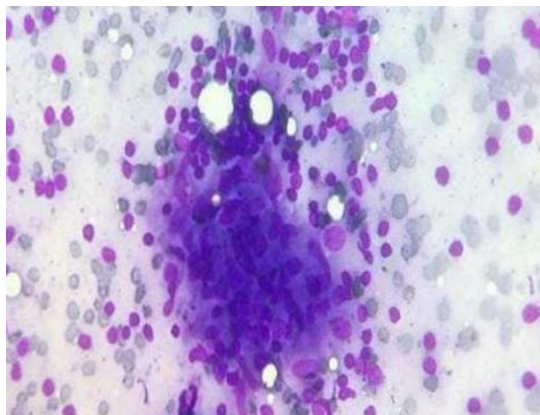
Non Neoplastic lesions were most common lesion in the study(57.14% cases) of which Chronic Sialadenitis was reported as most common cause (20.4% cases), followed by Abscess (14.2% cases)



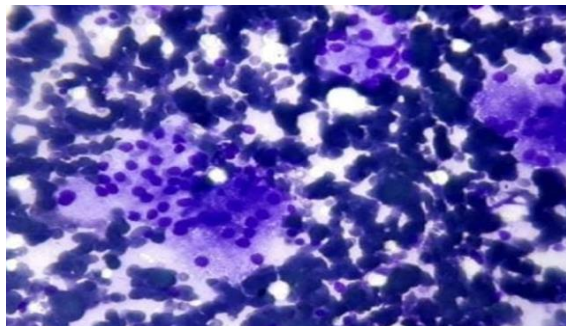
**Picture 1:** Acute Sialadenitis Photomicrograph shows clusters of ductal epithelial cells against a background of neutrophils and red blood cells (Giemsa 400X)



Picture 2: Chronic Sialadenitis Photomicrograph shows clusters of salivary gland ductal epithelial cells present in a haemorrhagic background containing numerous lymphocytes. (Giemsa 400X)



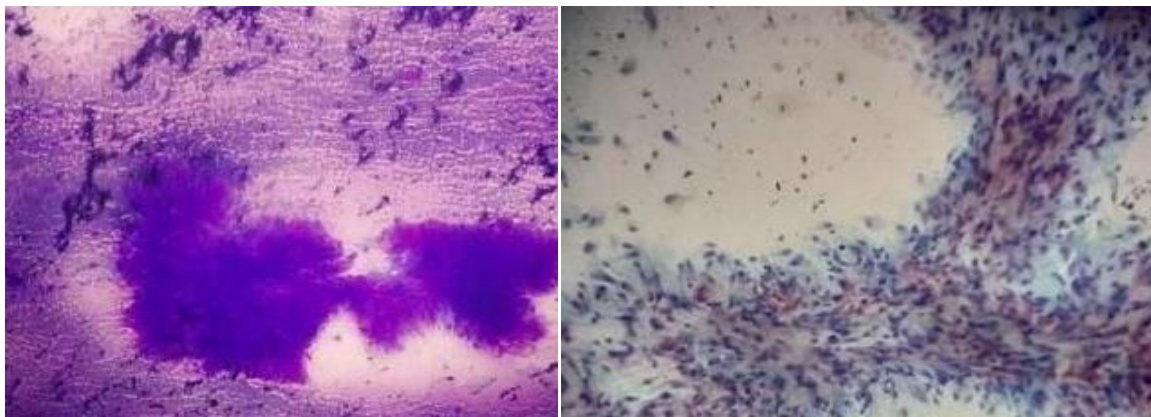
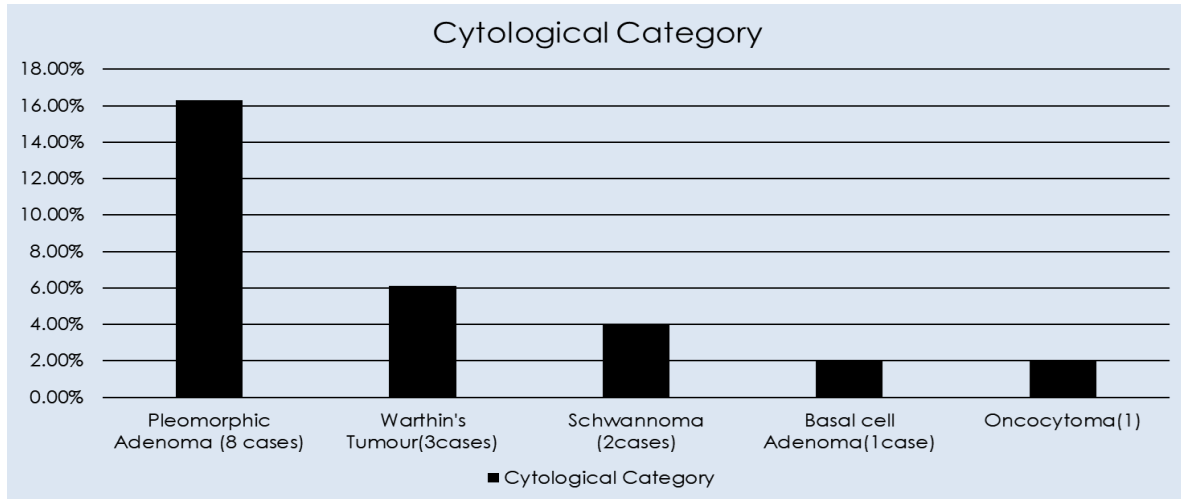
Picture 3: Granulomatous Sialadenitis Photomicrograph shows a well-formed epithelioid cell granuloma admixed with lymphocytes (Giemsa, 400X)



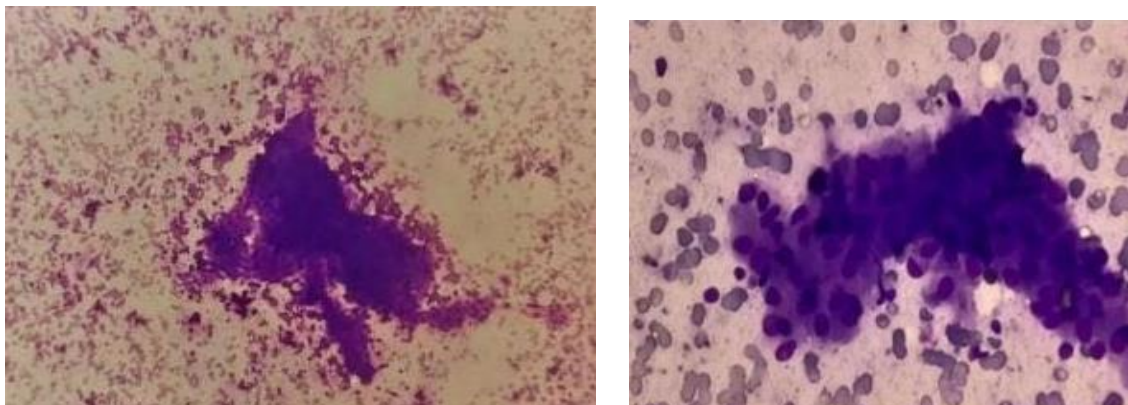
Picture 4: Sialadenosis Photomicrograph shows clusters of enlarged salivary gland acini with stripped nuclei in the haemorrhagic background (Giemsa 400X)

**Benign tumors:-**

- Benign tumors of salivary glands comprised 30.6% of total cases in the study in which **Pleomorphic Adenoma** accounted for maximum number of cases (16.32%) followed by Warthin’s tumor (6.1% cases)



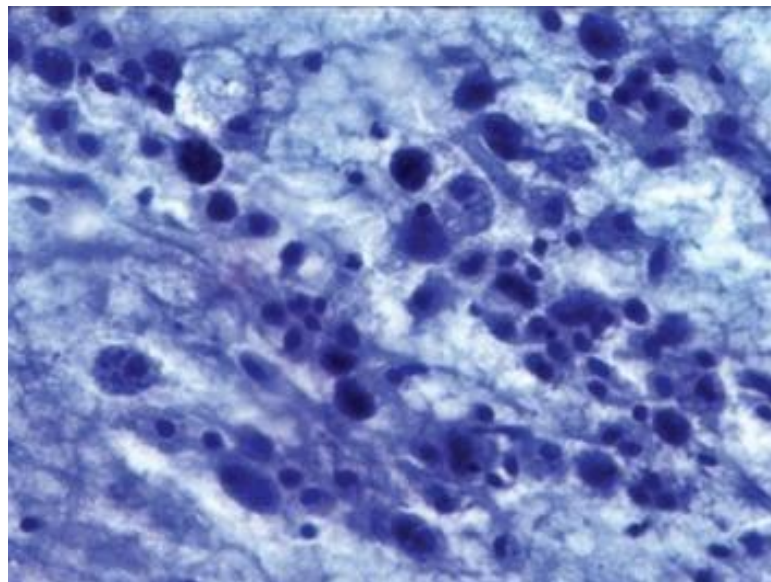
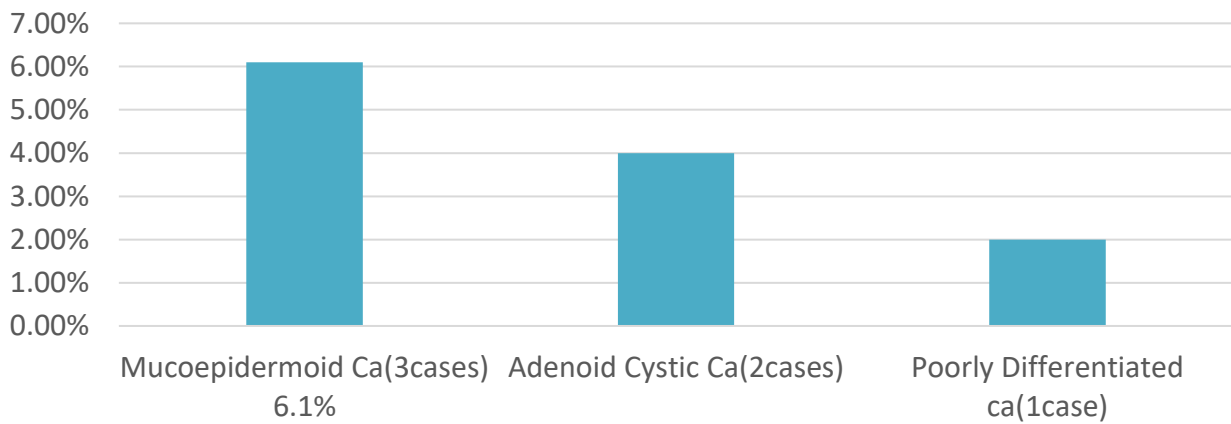
**Picture 5 & 6:** Pleomorphic Adenoma Photomicrograph shows chondromyxoid stromal fragments within which are embedded epithelial cells and myoepithelial cells. (Giemsa 100X, Pap Stain 400X)



Picture 7 & 8: Warthins tumor Photomicrograph shows clusters of oncocytes having abundant granular cytoplasm present against a dirty proteinaceous background containing lymphocytes (Giemsa 100X, 400X)

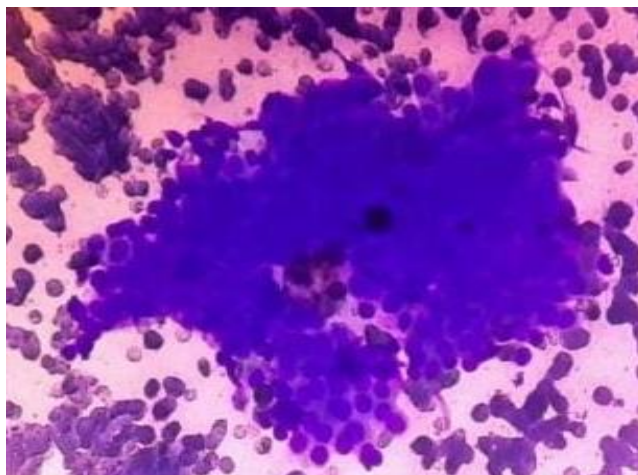
**Malignant tumors:-**

- Malignant tumors were diagnosed in 12.2% patients with Male predominance
- **Mucoepidermoid cancer** was the most common cause (6.1% cases) followed by Adenoid cystic carcinoma (4% cases)



Picture 9: Mucoepidermoid Carcinoma Photomicrograph shows cells with abundant squamoid to vacuolated cytoplasm and large nuclei with a prominent nucleoli and necrotic background (Giemsa ×400).





Picture 10: Adenoid cystic carcinoma, photomicrograph shows cohesive and multilayered dense cell clusters. Hyaline globule and extracellular hyaline material surrounded by tumor cells (Giemsa 400X)

## DISCUSSION:

The current investigation underscores the significance of FNAC as an initial minimally invasive approach, aiding in the primary diagnosis and thereby circumventing major surgical procedures in cases of inflammatory and benign tumors. Proficient sampling techniques, meticulous smear preparation, and expertise in cytopathology enable the diagnosis of the majority of salivary lesions. This study encompassed 49 cases of major salivary gland lesions, spanning various age groups and genders. The age range was 14-75 years, with a mean age of 46.5 years, and a predominance of males was observed. Non-neoplastic and benign lesions were more prevalent in the younger age group, while malignancies were more common in the elderly population. These findings align with the research conducted by Chaudhury et al. [4].

Our investigation revealed the parotid gland as the most common site for salivary gland lesions (65.3% cases), followed by the submandibular gland (30.6% cases). Additionally, non-neoplastic lesions constituted approximately 57.14% of all salivary gland lesions, with chronic sialadenitis surpassing acute sialadenitis in frequency. These results are consistent with the study conducted by Singh Nanda KD et al. [5]. Among neoplastic lesions, our study identified 30.61% as benign and 12.24% as malignant cases. Pleomorphic Adenoma emerged as the most frequently encountered benign neoplasm (16.32%), with a higher incidence in the parotid region.

In the present study, the malignant salivary gland neoplasms affected male patients with age >40yrs. Mucoepidermoid carcinoma was most commonly noted (6.1% cases) involving the Parotid gland. Similar findings are also documented by Gupta R et al. [6]

### **CONCLUSION:**

- The present study concluded that Fine Needle Aspiration Cytology being a minimally invasive technique is an accurate and time saving method useful for clinical management of patients with salivary gland lesions.
- Being a quick procedure giving timely reports, it allays anxiety in minds of patients and discomfort associated with open biopsy.
- Preoperative use of FNAC helps in making a primary diagnosis avoiding unnecessary surgery in inflammatory and benign tumors.
- The surgeon can make rightful decision on the type and extent of surgery if indicated

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**CONFLICT OF INTEREST:** Nil.

**DECLARATION:** I declare that the paper entitled “**FNAC based Cytomorphological Spectrum of Salivary Gland Lesions: A Retrospective Study in a Tertiary Care Centre in Chhattisgarh**” is my original work.

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