

## Fine Needle Aspiration Cytology-Study of 63 Parotid Gland Lesions in a Tertiary Care Centre

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### ABSTRACT:

**Introduction:** Major salivary glands are easily accessible therefore, they are optimal targets for fine-needle aspiration (FNA). Fine needle aspiration cytological study is being increasingly used in the diagnosis of parotid gland lesions. Salivary gland tumors contribute less than 3% of all head and neck tumors. FNA is popular method for evaluating parotid gland lesions. Study is to know the incidence of parotid lesion in the material received at the Siddhartha Medical College, Vijayawada during the period of study, from May 2018 to April 2019 and analyze the results in correlation with the histopathology .

**Materials and methods:** Patients with parotid gland swellings from the surgical O.P in the GGH, Vijayawada. In the prospective study period of 2018-2019 63 cases of FNAC and 30 cases of biopsies which were studied to know the cyto-histopathological correlation in parotid lesions.

**Results:** 63 patients with parotid gland swelling, who were willing to undertake FNAC procedure, were brought to the department of pathology and the aspiration was done . Of these 63 aspirations 8 aspirations were either Inadequate or inconclusive and hence no diagnosis could be achieved. The FNAC was done in 63 case and only 30 patients turned up for biopsy. Among non neoplastic lesions most common were cystic lesions and non specific parotitis. Among benign neoplastic lesions pleomorphic adenoma is the commonest one. Among malignant neoplastic lesions mucoepidermoid carcinoma is the commonest one.

**Conclusion:** Fine needle aspiration cytological study can be a great helpful diagnostic procedure in clinical practice to differentiate between non neoplastic and neoplastic lesions. The results show that although FNAC is relatively inexpensive and minimally invasive, it cannot be relied upon to provide an accurate tissue diagnosis, may fail to identify malignancy and does not prevent patients undergoing surgery for non-neoplastic conditions.

### I. INTRODUCTION

Major salivary glands are easily accessible therefore, they are optimal targets for fine-needle aspiration (FNA) .Fine needle aspiration cytological study is being increasingly used in the diagnosis of parotid gland. Salivary gland tumors contribute less than 3% of all head and neck tumors. FNA is popular method for evaluating parotid gland lesions. FNA is a simple technique. There are many advantages and a few disadvantages along with occasional complications. The technique is very simple, inexpensive reliable procedure. Most FNAs of the salivary glands can be performed in an outpatient setting and no anesthesia or hospital stay is . This is a relatively painless procedure. Immediate assessment of the material is usually possible within 30 minutes. FNA enables high accuracy in identifying the nature of a lesion .Differentiation of the specific tumor cell type can be achieved easily. Determination of site of origin, i.e. whether the tumor has arisen from the parotid or if it is metastatic, is possible.

### AIMS

To know the incidence of parotid lesion in the material received at the Siddhartha Medical College, Vijayawada during the period of study, from May 2018 to April 2019 .To study the cytological spectrum of parotid gland lesion. To correlate the cytological findings with histopathological appearances.

### OBJECTIVES

To review the lesions of the salivary glands particularly of parotid gland. To study the cytological appearances of parotid lesions by obtaining material through FNA. To observe the prevalence, incidence, age and sex ratio among the patients with parotid lesions who attended Government general Hospital Vijayawada. To correlate the cytological finding with histological appearances and to find out non-correlating areas. To demonstrate the efficacy. limitations of FNA Cytology in diagnosing parotid lesions. To explore and establish the accuracy, sensitivity and specificity of FNAC and to prove that FNAC is a preliminary effective diagnostic tool in studying parotid lesions.

## II. MATERIALS AND METHODS

Patients with parotid gland swelling from the surgical O.P in the GGH, Vijayawada. Disinfectant solution, disposable gloves, clean glass slides, disposable syringes (10ml-20ml) with,22-23-guaze needles, Sterile cotton swabs and coplin jar with fixative solutions-methanol. Staining kit including special stains, microscope and report forms. Surgical biopsies are processed along with routine biopsies and stained.

### Methods

1. Taking the history, clinical examination was done After taking consent, fNA was performed. The cytological specimens obtained on slides was fixed and stained with Hematoxylin and Eosin stain routinely. In case of Adenocarcinomas special stains in were done to differentiate from other histological types.

### Routine stains used are:

1. Hematoxylin and eosin stain.
2. Giemsa stain\*
3. Papanicolaou stain\*

\* Both stains are helpful to differentiate cytoplasmic and nuclear features.

### Special stains

1. Mucicarmine stain (Mayer's)
2. Periodic acid-schiff's stain.
3. Alcian blue stain.
4. Alcian blue with Periodic Acid Schiff's stain.

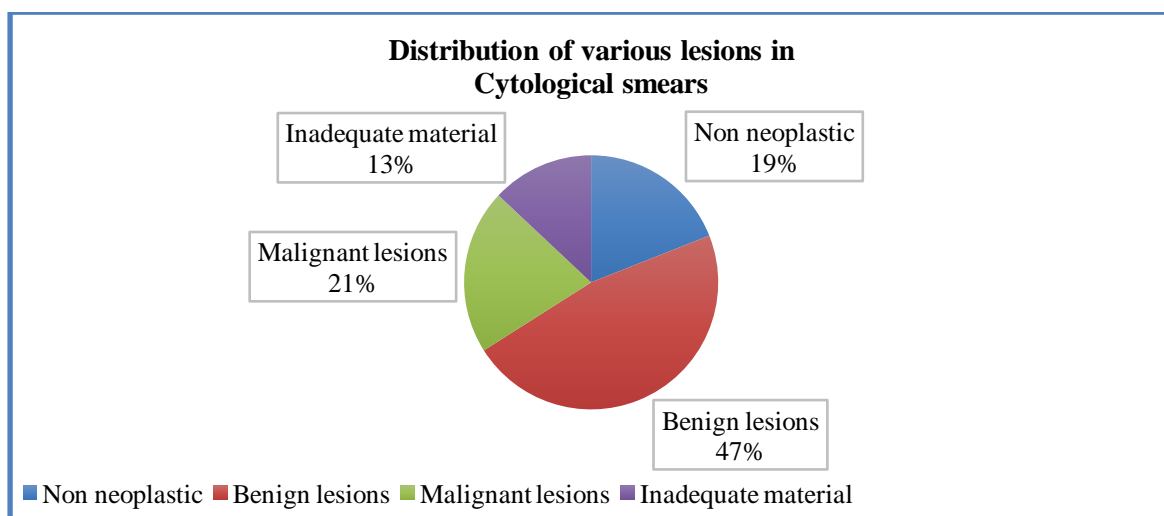
## III. RESULTS AND OBSERVATIONS

The present study was done from May 2018 to April 2019 in which cytological material and biopsies were included during the above period To the material in the present study, the cytological smears and biopsies that were available in the department of pathology, Siddhartha Medical College. Vijayawada being added for completion of the results.

**Table 1**

Statistical analysis of cases with parotid lesions Included in this study carried out from May 2018 to April 2019 in cytology smears.

Type of lesions	No of cases
Non neoplastic lesions	12
Neoplastic benign lesions	30
Neoplastic malignant lesions	13
Inadequate Material	8
Total	63



**Table-II**

Statistical analysis of cases with parotid lesions included in this study carried out from May 2018 to April 2019 in ***Biopsy specimens***

Lesions	No of cases
Non neoplastic lesions	5
Neoplastic benign lesions	14
Neoplastic malignant lesions	10
Inadequate material	1
<b>Total</b>	<b>30</b>

63 patients with parotid gland swelling, who were willing to undertake FNAC procedure, were brought to the department of pathology and the aspiration was done. Of these 63 aspirations 8 aspirations were either Inadequate or inconclusive and hence no diagnosis could be achieved. The FNAC was done in 63 case and only 30 patients turned up for biopsy. One biopsy was inadequate for study.

**Table-111**

Distribution of various parotid lesions in cytological study.

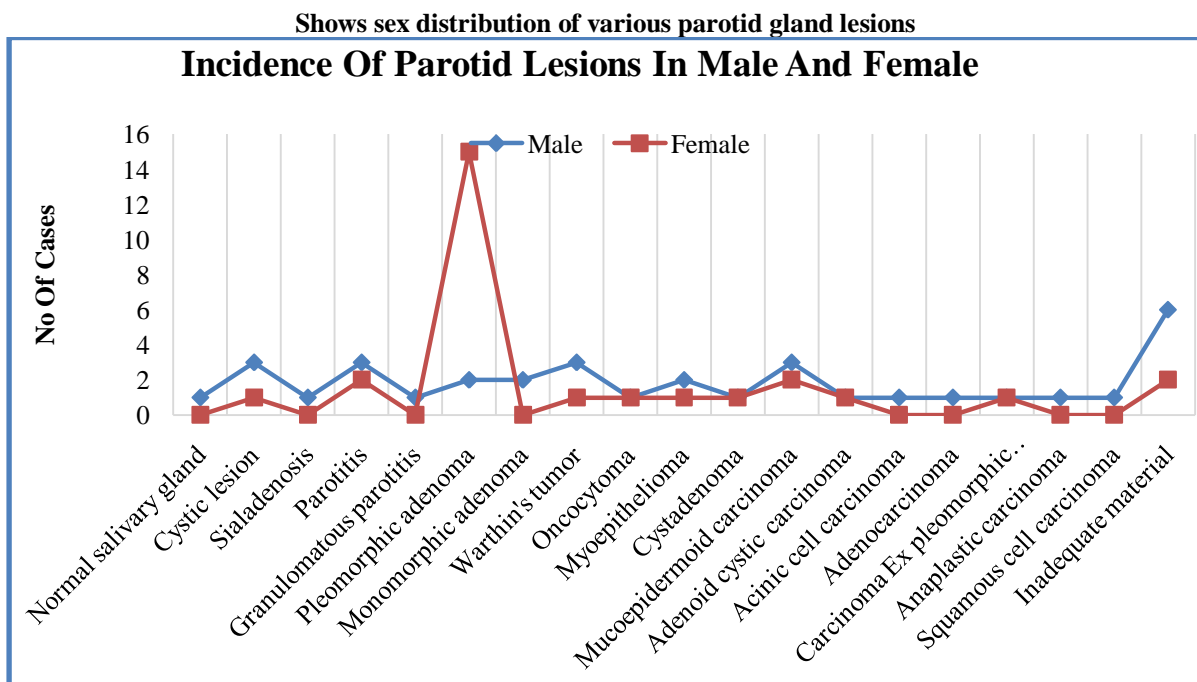
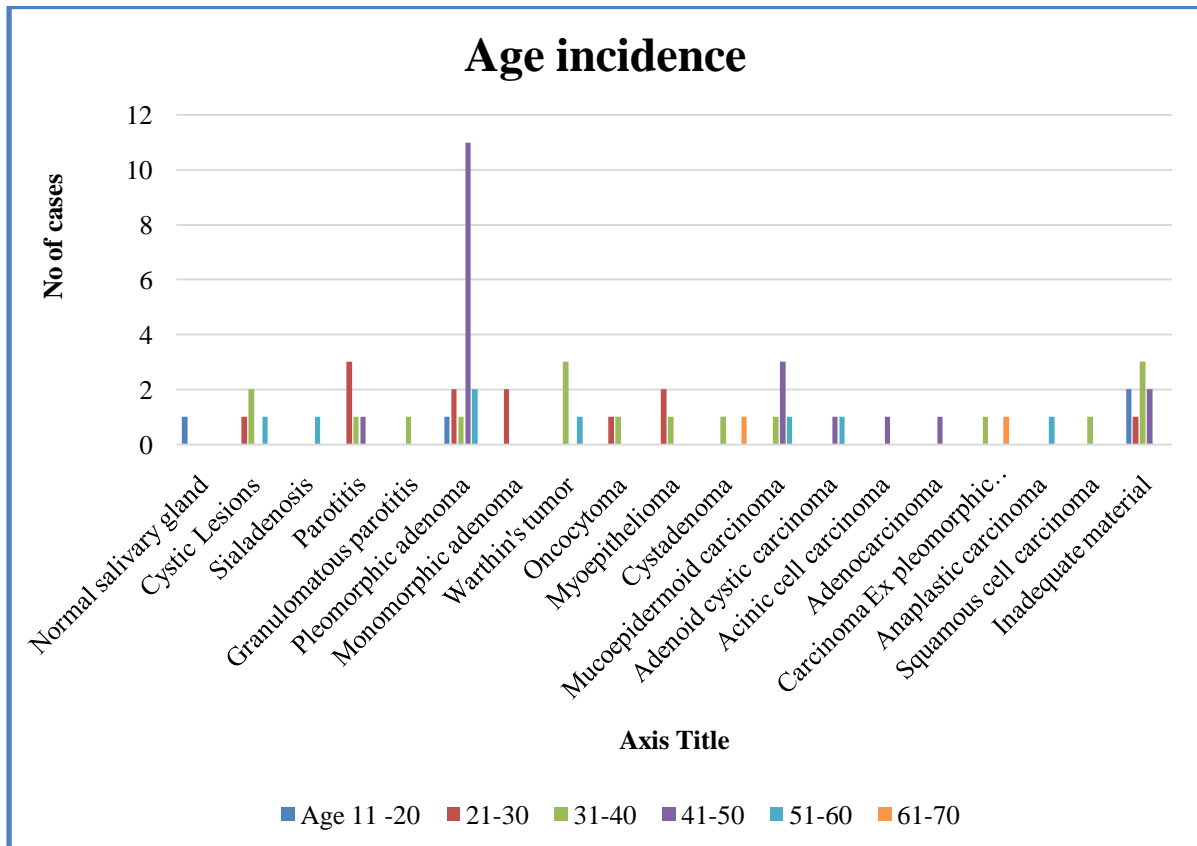
No	Type of lesion	No of cases
1.	Normal salivary gland	1
2.	Cystic lesion	4
3.	Sialadenosis	1
4.	Parotitis	5
5.	Granulomatous parotitis	1
6.	Pleomorphic adenoma	17
7.	Monomorphic adenoma	2
8.	Warthin's tumor	4
9.	Oncocytoma	2
10.	Myoepithelioma	3
11.	Cystadenoma	2
12.	Mucoepidermoid carcinoma	5
13.	Adenoid cystic carcinoma	2
14.	Acinic cell carcinoma	1
15.	Adenocarcinoma	1
16.	Carcinoma Ex pleomorphic adenoma	2
17.	Anaplastic carcinoma	1
18.	Squamous cell carcinoma	1
19.	Inadequate material	8
	<b>Total</b>	<b>63</b>

Among non neoplastic lesions most common were cystic lesions and non specific parotitis. Among benign neoplastic lesions pleomorphic adenoma is the commonest one. Among malignant neoplastic lesions mucoepidermoid carcinoma is the commonest one.

In 63 cases FNA was performed and 30 patients have undergone biopsy. There was differed diagnosis in certain cases.

- In 3 cases the cytological features were benign (Parotitis-2, Cystic-1) but the histopathological study revealed features of malignancy (Mucoepidermoid carcinoma-3).
- In 1 case the cytological features showed malignancy (Adenoid cystic carcinoma) but the histopathological study revealed benign features (Pleomorphic adenoma).
- In 1 case the cytological features were benign (Myoepithelioma) but the histopathological study revealed features of another benign tumor (Pleomorphic adenoma).

- In 1 case the cytological features were of a malignant tumor (Mucoepidermoid carcinoma) but the histopathological study revealed features of other malignant tumor (Squamous cell carcinoma). An attempt was made to correlate the data that was available in the department of pathology SMC, Vijayawada of the preceding 5 years.



#### IV. DISCUSSION

The salivary gland diseases represent a different group of disorders affecting both the major and minor salivary glands. These conditions range from inflammatory disorders, infectious, granulomatous or autoimmune etiology to obstructive developmental, Idiopathic disorders and neoplasms. The major salivary glands are most often involved. FNA is considered to be one of the reliable diagnostic procedures. FNA has become a routine diagnostic and therapeutic technique. The present study comprises 63 cases in all these cases the FNA was done and 30 cases of biopsies were received. The cases included both non-neoplastic and neoplastic lesions. Out of 63 cases the Cytology revealed 12 non-neoplastic lesions, 30 benign tumors and 13 malignant lesions. There were 8 inadequate smears in which the diagnosis could not be reached. The histopathological study could be done in 30 cases where biopsies were available. Of these 5 non-neoplastic lesions, 14 benign tumors and 10 malignant lesions could be made out, in one case the tissue was inadequate and diagnosis could not be achieved.

Comparison of age range in present series with other series.

S. No.	Place and authors	Youngest Patient (years)	Oldest Patient (years)	Average Age incidence
1.	Bombay (Golwala et al.)	9	76	40.4
2.	Delhi (Narender Singh 1968)	9	90	49.5
3.	Calcutta (Dutta and Gupta et al.)	19	60	32.5
4.	USA (Foote & Frazel et al.)	11	76	42.0
6.	In our study (2018)	11	70	40.5

The table shows that the minimum age for parotid lesions is 11 years and maximum age is 70 years. The average age incidence is 40.5 years.

**Table-XVI**

Distribution of various parotid gland tumours and comparison with Indian authors.

S.No.	Type of tumor	G.G Potdar et al. 1969	A.S Fern et al. 1982	Manjula et al. 1971	S.N Budhra Ja et al. 1974	Present series 2018
1.	Pleomorphic adenoma	96	16	15	24	17
2.	Adenolymphoma	12	1	5	1	4
3.	Oncocytoma	-	-	-	-	2
4.	Malignant mixed tumors	6	1	5	1	2
5.	Mucoepidermoid carcinoma	13	6	-	4	5
6.	Adenoid cystic carcinoma	14	1	3	-	2
7.	Acinic cell carcinoma	24	5	2	5	1
8.	Adenocarcinoma	-	-	-	-	1
9.	Anaplastic carcinoma	-	3	2	-	1

The above table shows that the commonest benign tumor is pleomorphic adenoma and the commonest malignant tumor is mucoepidermoid carcinoma. The present series show age range from 11 years to 70 years with a mean age of 40.5 years and incidence is more in the females than males in the benign tumors.

## V. SUMMARY

The purpose of the present study was to assess the value of fine-needle aspiration cytology (FNAC) in parotid masses in correlation with histopathology wherever available. The present study comprised 63 cases of parotid lesions conducted during the period of May 2018-April 2019 constituting 1.91% of total FNAC that were done in the department of pathology, Siddhartha medical college, Vijayawada. Out of 63 cases in 8 cases the material was inadequate.

The maximum number of cases seen in 3rd and 4th decades. Number of cases seen in males was 35 (55.5%) and in females was 28 (44.6%). The parotid gland lesions were studied under three major groups i.e. Non neoplastic 12 (19%), benign lesions 30 (47.6%), malignant tumors 13 (20.6%). There were 12 non-neoplastic lesions out of which 4 cystic lesions, sialadenitis, 5 parotitis and 1 granulomatous parotitis were seen. Among benign lesions pleomorphic adenoma constituted 17 cases (56.6% among all benign tumors), monomorphic adenoma constituted 2 cases (6.6%), 4 cases (13.3%) of Warthin's tumors 2 cases (6.6%) of oncocytoma, 3 cases of myoepithelioma (10%), and cases (6.6%) of cystadenoma.

Among malignant tumors mucoepidermoid carcinoma constituted 5 cases (38.5%), 1 case (7.6%) of acinic cell carcinoma, adenocarcinoma 1 case (7.6%), carcinoma ex pleomorphic adenoma 2 cases (15.3%), squamous cell carcinoma 1 case (7.6%), and anaplastic carcinoma 1 case (7.6%). Adenoid cystic carcinoma 2 cases (15.3%). Histopathological correlation obtained in 24 cases. The current study revealed diagnostic accuracy rate of 80%. The correlation between cytology and histopathology was not possible in 6 cases.

## VI. CONCLUSION

In the prospective study period of 2018-2019 63 cases of FNAC and 30 cases of biopsies which were studied to know the cyto-histopathological correlation in parotid lesions.

Fine needle aspiration cytological study can be a great helpful diagnostic procedure in clinical practice to differentiate between non neoplastic and neoplastic lesions. Among neoplastic lesions to differentiate between benign and malignant tumors, and within malignant tumors to differentiate the histological type, the cytological study is of great help in diagnosis. As the accuracy rate is 80% in our series the study, it indicates that Fine needle aspiration cytology can be a reliable diagnostic pre-operative procedure which offers many benefits to both patients and clinicians in planning the therapeutic procedures. It is a safe and reliable technique as a first line of investigation in the diagnosis and management of parotid gland lesions.

The results show that although FNAC is relatively inexpensive and minimally invasive, it cannot be relied upon to provide an accurate tissue diagnosis, may fail to identify malignancy and does not prevent patients undergoing surgery for non-neoplastic conditions. Fine-needle aspiration cytology was found to be an effective diagnostic tool in the hands of experienced pathologists.

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