

STUDIES ON PAROTID GLAND NEOPLASMAS USING FINE NEEDLE ASPIRATION CYTOLOGY

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BACKGROUND:

The most common target organs where fine needle aspiration cytology (FNAC) is performed are salivary glands because of their superficial location and easy accessibility introduced into a mass, cellular material is aspirated, and a cytological diagnosis is rendered as It separates reactive and inflammatory processes that do not require surgical intervention from neoplasia and benign from malignant tumors.

OBJECTIVES:

To study the cytomorphological features in lesions of salivary glands. To correlate the cytological features with histopathological features wherever possible. To evaluate the diagnostic utility of fine needle aspiration cytology of lesions in the salivary glands.

METHODOLOGY:

A total of 120 patients with salivary gland diseases were included in the study. This is a retrospective cohort study, undertaken in the Department of Pathology, Fathima Institute of Medical sciences, Kadapa during the period of Jan 2016 to Feb 2020. The sensitivity, specificity and overall diagnostic accuracy was calculated using Galen and Gambin method.

RESULTS:

Our study included 120 patients with salivary gland diseases. Age group of patients with salivary gland diseases ranged from 10 years to 88 years with the mean age of 44.62 years. Majority of the patients belonged to the age group of 31-40 years (35%). Male to Female ratio was 1.25: 1. Among the 120 patients, most common non neoplastic 67.52%, benign 71.79% and malignant 28.20% lesions.

CONCLUSION:

FNAC of salivary gland is a reliable and sensitive diagnostic method for diagnosis of salivary gland lesions. It not only provides preoperative diagnosis for management but also can prevent unnecessary surgeries.

KEY WORDS:

Fine needle aspiration cytology (FNAC), Salivary gland lesions, Diagnostic accuracy, Sensitivity, Specificity

INTRODUCTION

Salivary glands are one of the most common target organs where fine needle aspiration cytology (FNAC) is performed because of their superficial location and easy accessibility. Many pertinent questions concerning a mass arising in the salivary gland region can be answered by evaluation of fine needle aspiration (FNA) cytologic material and these include whether the mass is truly of salivary gland origin, whether the lesion is inflammatory or neoplastic and if neoplastic whether benign or malignant.¹ It has been shown that FNAC of salivary gland lesional tissue, determine the need for surgical intervention and assist in planning the appropriate surgical approach prior to resection.² The usefulness of salivary gland FNA relates to the fact that it is easy to perform, is minimally invasive, smear evaluation is immediate, and the procedure can be repeated several times to obtain more tissue for diagnosis or special studies.³ There is perhaps no tissue anywhere in the body that is subject to such a diverse and heterogeneous range of tumours and tumour-like conditions, resulting in fascinating cytopathology, encountered in more than 500 salivary glands present in the human body. It also produces diagnostic limitations, which must be appreciated by both pathologists and clinician if the extensive benefits of the technique are to be fully and safely utilized in patient management.⁴⁻⁷ An additional challenge for salivary gland FNA is the significant cytomorphologic diversity and overlap between many benign and malignant salivary gland tumors. In general, ancillary marker studies are of limited value in solving this problem because many salivary gland tumors have a similar composition of epithelial and myoepithelial cells. With all of these hurdles to overcome, it is quite impressive that salivary gland FNA emerges as an accurate and effective tool for diagnosing this complex group of lesions. Currently, FNA has gained wide acceptance as a first-line procedure in the evaluation of a salivary gland mass.⁸⁻¹⁰

MATERIALS AND METHODS

The present study –CYTOPATHOLOGY OF SALIVARY GLAND LESIONS is a prospective study, undertaken in the Department of Pathology, Fathima Institute of Medical sciences, Kadapa during the period of Jan 2016 to Feb 2020. All the patients referred to the Department of Pathology for fine needle aspiration cytology of lesions in salivary glands during this period, were included in the study.

Inclusion criteria:

All clinically palpable lesions of the salivary glands.

Exclusion criteria:

- Absence of detectable mass.
- Patients with bleeding diathesis.
- Non co-operative patients.

All the patients having salivary gland lesions were subjected to detailed clinical

examination. After obtaining an informed consent, under aseptic precautions FNAC was performed using 22 or 23 gauge, 30- 40 mm long needle fitted to a 5 ml syringe. The lesion was grasped between the index finger and thumb of the left hand and the needle fitted to the syringe was pierced into the lesion.

RESULTS

The present study deals with the cytomorphological features of fine needle aspiration of the lesions of salivary glands and its clinical utility as a diagnostic tool. The study consisted of 120 aspirations done. The salient observations made in this study are as follows.

Table 1: Age distribution pattern in salivary gland lesions

AGE (years)	Number of cases	Percentage
0-10	01	0.83%
11-20	19	15.83%
21-30	20	16.66%
31-40	42	35%
41-50	17	14.16%
51-60	10	8.33%
61-70	8	6.66%
71-80	2	1.66%
81-90	01	0.83%
Total	120	100%

Age of the patients with salivary gland lesions ranged from 10 years to 88 years with the mean age of 44.62 years. Majority of the patients with salivary gland lesions were encountered in the age group of 31-40 years (35%) followed by 21-30 and 11-20 year age group.

Table 2: Gender distribution pattern in salivary gland lesions

Sex	Number of cases	Percentage
Male	65	54.16%
Female	55	45.83%
Total	120	100%

Out of 120 patients 65 (54.16%) were males and 55 (45.83%) were females.

Male to Female ratio was 1.25: 1

Table 3: Clinical features in the salivary gland lesions

Sl. No	Associated clinical features	No of patients
1	Swelling in the parotid region	35
2	Swelling in the submandibular region	25
3	Hard palate swelling	4
4	Ulcer in the buccal mucosa	1
5	Pain at the swelling site	6
6	Pain the swelling while taking food	12
7	Fever	9
8	Inflamed salivary duct opening	6
9	Local rise of temperature	6
10	H/O decreased secretion of saliva	3
11	Loss of weight and appetite	3
12	Ulcerated/ sinuses of skin over the swelling	4

13	Facial palsy	2
14	Associated lymph node enlargement	1
15	Associated Diabetes mellitus	3

In the present study, majority 35 patients presented with parotid swelling. Submandibular swelling was a presenting complaint in 25 cases. 4 patients presented with swelling in the hard palate and one patient with ulcer in the buccal mucosa. Six were shown pain at the swelling site. Pain during intake of food was the complaint in 12 cases. Fever was noticed in nine cases. Inflamed salivary duct opening in 6 cases, local rise of temperature of the swelling was seen in 6 cases. Decreased secretion of saliva was noticed in 3 cases, which included sialadenitis of autoimmune origin in one and other was chronic sialadenitis. Ulceration of the skin over swelling was noticed in 4 cases. Facial palsy was noted in 2 cases. Loss of weight and appetite was noted in three cases which were malignant lesions. Three patients had associated Type 2 diabetes mellitus (NIDDM). One patients had lymphadenopathy, which were proved to be salivary gland inclusions in lymph nodes.

Table 4: Incidence of cytologically diagnosed non neoplastic and neoplastic lesions

Sl No	Lesions	No of cases	Percentage	No of aspirations	Percentage
1	Non-neoplastic	81	67.52%	81	67.52%
2	Neoplastic	39	32.51%	39	32.51%
	TOTAL	120	100%	120	100%

Fine needle aspirations performed on 120 patients, cytological diagnoses of

non-neoplastic lesions were made in 81 (67.52%) aspirations done on 81 (67.52%) patients, and cytological diagnoses of neoplastic lesions was made in 39 (32.51%) aspirations done on 39 (32.51%) patients.

Table 5: Table showing distribution of cytological diagnosed neoplastic salivary gland lesions

Sl No	Lesions	No of cases	Percentage	No of aspirations	Percentage
1	Benign	28	71.79%	28	71.79%
2	Malignant	11	28.20%	11	28.20%
	TOTAL	39	100%	39	100%

Cytological diagnoses of neoplastic lesions were made in 39 cases (39 aspirates) which included 28 benign neoplasms (71.79%) and 11 cases of malignant neoplasms (28.20%). The various photo micrographs of patients showing various salivary malignancies were presented as photoplate-1 to 3.

DISCUSSION

Salivary gland cytopathology is a diagnostically challenging area in part because of the wide variety of neoplasms arising in the salivary glands and the overlapping cytomorphologic features of so many of these tumours¹¹⁻¹⁵. There are many benefits to using FNA in the evaluation of a salivary gland mass. Salivary gland FNA is easily performed, minimally invasive, safe, cost effective and accurate, provides a rapid diagnostic interpretation (usually within 15–30 minutes), and can easily be used to obtain material for special ancillary studies¹⁶. our present study is very much consistent with previous studies as shown in table 6.

Table 6: correlation between present work and previous work

Author s	Year	Sample size	Conclusions
C.J.R. Stewart et al ¹⁷	2000	341	FNA cytology provides accurate diagnosis of most salivary gland lesions and contributes to conservative management in many patients with nonneoplastic conditions.

He Wang et al ¹⁸	2015	100	Advantages of FNAB are that it is safe and simple, it can be performed as an outpatient procedure, and it is well tolerated by patients. In the present managed care environment, it also proves cost-effective. The diagnosis is readily known to the clinician, and appropriate treatment modalities can be discussed with the patient. It is recommended as a first line of investigation in palpable head and neck masses.
Raval et al ¹⁹	2015	34	The value of FNAC as a diagnostic tool was with 96.66% specificity and 75% sensitivity. Conclusion: Pleomorphic adenoma is most common benign pathology. Superficial parotidectomy is the most commonly offered surgical procedure. Parotid surgeries are safely performed with low morbidity and no mortality.

Diana Montezuma MD et al ²⁰	2018	388	Salivary gland FNA has high diagnostic accuracy and assists clinical management independently of the reporting system used, however, in some cases, the use of Milan system could be beneficial, since it allows an enhanced category stratification.
Tomer Boldes ²¹	2021	505	Our findings highlight the limitations of FNA as a decision-making tool in preoperative evaluation of parotid masses. Clinicians should take into account that FNA is inaccurate for identifying specific subtypes of malignant lesions, which may eventually delay treatment and influence.
Maria Rivera Rolon MD et al ²²	2020	208	Fine-needle aspiration cytology continues to be an accurate diagnostic tool for most salivary gland neoplasms showing classical morphologic features. However, difficult cases with unusual or overlapping features will occur. In these situations, the use of MSRSGC risk-stratification could be helpful to define appropriate management.
Present study	2022	120	FNAC of salivary gland is a reliable and sensitive diagnostic method for diagnosis of salivary gland lesions. It not only provides preoperative diagnosis for management but also can prevent unnecessary surgeries.

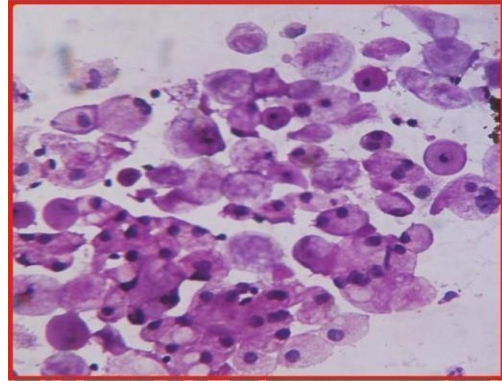
CONCLUSION

Fine needle aspiration cytology of the lesions in salivary glands was proved to be useful technique for the evaluation of patients having salivary gland masses. It was a sensitive and specific diagnostic tool in our institution. Particular attention to subtle morphologic changes may aid in avoiding pitfalls and arriving at the right diagnosis. Diagnostic accuracy can be further improved by analyzing more number of cases along with histopathological correlation.

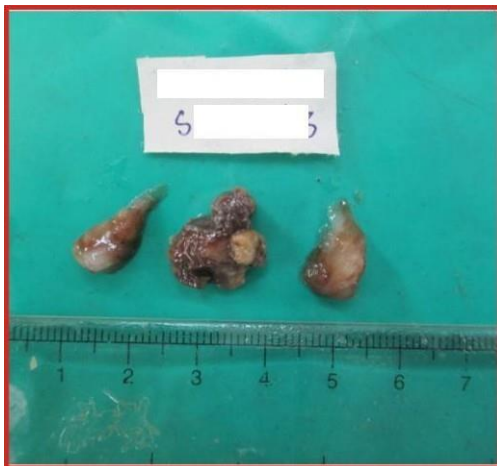
PHOTO PLATE -1



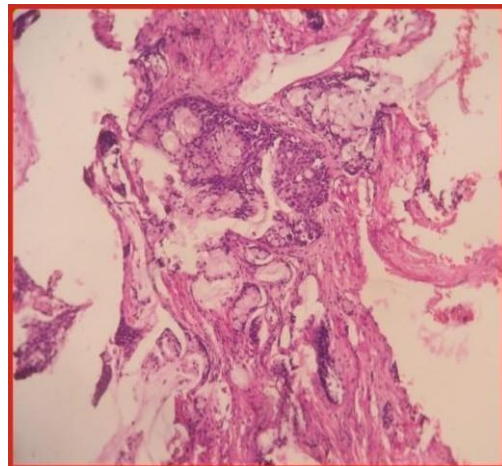
Clinical photograph of a patient with mucus cyst



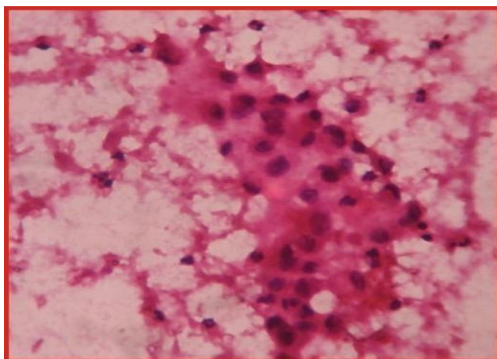
Photomicrograph of mucus cyst in a cytologically diagnosed of MEC: showing mucus cells (H&E x400)



Photograph of surgically resected specimen of mucus cyst



Photomicrograph of a mucus cyst on histology (H&E x100)

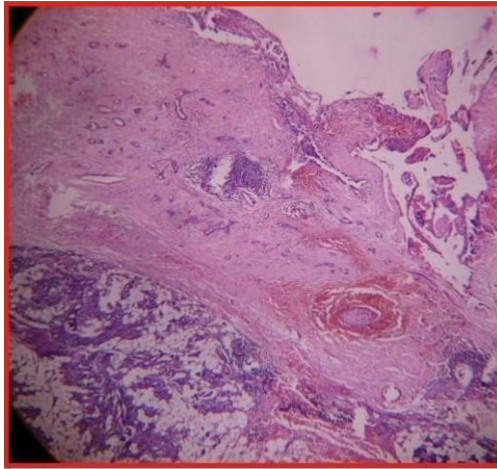


Photomicrograph of lymphoepithelial cyst on cytology: showing epithelial cells in a background of lymphocytes. (H&E x400)



Photograph of surgically resected specimen of Lymphoepithelial cyst

PHOTO PLATE - 2



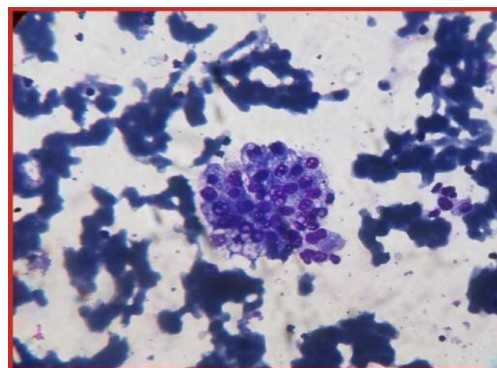
Photomicrograph of lymphoepithelial cyst on histology (H&E x100)



Photomicrograph of a small foci of myoeplithelioma seen in a case of lymphoepithelial cyst on histology (H&E x400)



Clinical photograph of a patient with pleomorphic adenoma of right parotid gland

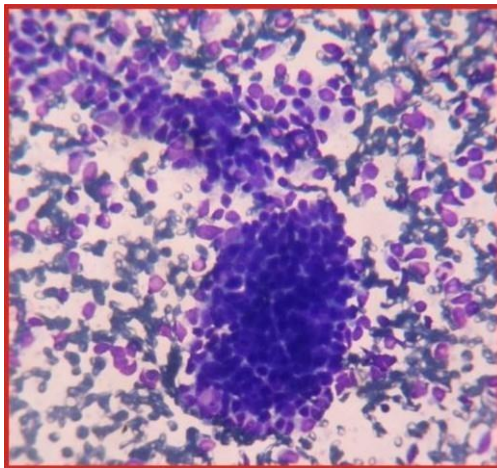


Photomicrograph of a cytologically diagnosed case of acinic cell carcinoma: showing epithelial cells with vacuolated cytoplasm (Geimsa x400)

PHOTO PLATE - 3



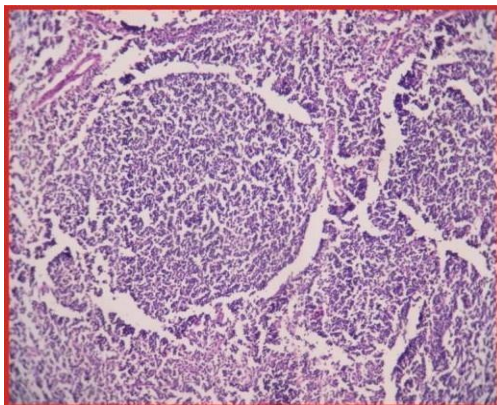
Clinical photograph of a patient with NHL



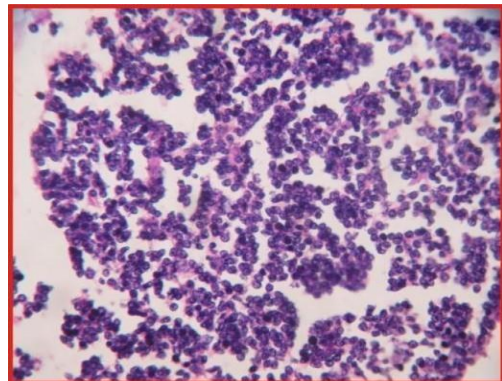
Photomicrograph of NHL on cytology: showing monomorphous population of lymphoid cells in cluster (Geimsa x400)



Photograph of surgically rejected specimen of NHL



Photomicrograph of NHL on histology (H&E x100)



Photomicrograph of NHL on histology (H&E x400)

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