

How to Cite:

Priya, N., Agarwal, M., Yadav, K., & Singhal, M. K. (2022). A prospective study to assess the clinical, cytological and histopathological findings of salivary gland lesions. *International Journal of Health Sciences*, 6(S5), 3410–3418. <https://doi.org/10.53730/ijhs.v6nS5.9375>

A prospective study to assess the clinical, cytological and histopathological findings of salivary gland lesions

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Abstract---Background: The purpose of FNAC is not only to provide a definite specific diagnosis. But it is also used in conjunction with clinical and radiological findings to provide the best possible initial assessment from which management can be planned. Keeping histopathological diagnosis as gold standard sensitivity, specificity and diagnostic accuracy of FNAC was calculated. Thus, the present study aims to correlate cytomorphological features of salivary gland lesions in FNAC and the corresponding histopathology in suspicious malignant cases. Materials & Methods: This is a prospective study done on 50 fine needle aspirates obtained from patients who visit department of pathology in SMS Medical College, Jaipur with various major salivary gland disorders. Patient's age, clinical history, ultrasonogram findings were recorded. Results: The mean age of patients was 48.3 yrs. The predominance of males about 60% of cases. Impression obtained was that incidence of non-neoplastic and benign lesions were higher (92%) than malignant (8%). Based on cytological findings, among the benign neoplastic lesions, pleomorphic adenoma was the most common constituting about 36%. Mucoepidermoid carcinoma is the most common malignant neoplasm constituting about 2%. The diagnostic accuracy of benign lesions &

malignant lesions was predicted to be 87% & 78% respectively. Conclusion: The present study confirms the usefulness of FNAC as a safe and economic procedure in distinguishing benign and malignant salivary gland lesions which are of utmost value in planning the further management of the patient.

Keywords---FNAC, Histopathological, Cytological, Benign lesions, Malignant lesions.

Introduction

Salivary gland lesions form 2-5 percent of all Head and neck neoplasms.¹ Age incidence varies widely, extending from children to adults over 80 years of age. These glands are usually not subjected to incisional or core needle biopsy, because of the possible risk of fistula formation and tumor seedling. Over the past three decades, in the work up of salivary gland lesion fine needle aspiration has been well recognized as the first diagnostic tool. It is widely accepted as a simple, safe, cost effective a technique in the evaluation of salivary gland lesions and thereby helps to plan for further management.

FNAC is a useful method for evaluating salivary gland lesions. It is of particular relevance in the head and neck area because of easy accessibility of the target site² minimally invasive procedure, excellent patient compliance and thereby help to avoid surgery in non-neoplastic, inflammatory conditions. The use of aspiration cytology was first reported by Kun in 1847. The procedure was reintroduced by Martin & Ellis in evaluation of head and neck lesions in 1930. It was further promoted especially in salivary gland lesions in 1950 and 1960 by Enroth et al.³ Major salivary gland neoplasms usually present with non-specific clinical symptoms, requiring high degree of suspicion. FNAC offers an invaluable and accurate initial diagnostic tool for the management of these patients even in the era of the Immunohistochemistry.

Keeping histopathological diagnosis as gold standard sensitivity, specificity and diagnostic accuracy of FNAC was calculated. An adequate and representative sampling is essential for proper cytological evaluation to reduce the errors in diagnosis. The diagnostic pitfalls in FNAC were evaluated along with practical suggestions to improve the diagnostic accuracy especially while dealing with mucinous lesions. Other varied reasons for diagnostic errors may be due to uncertainty of the site and tissues aspirated, minimal material and lack of architectural pattern in the smears as compared to histological sections. Relevant clinical data, radiological findings, along with cooperation between the clinician and cytopathologist⁴ are important in order to use FNAC to its best advantage. Thus, the present study aims to correlate cytomorphological features of salivary gland lesions in FNAC and the corresponding histopathology in suspicious malignant cases.

Materials & Methods

This is a prospective study done on 50 fine needle aspirates obtained from patients who visit department of pathology in SMS Medical College, Jaipur with various major salivary gland disorders. Patients age, clinical history, ultrasonogram findings were recorded.

Inclusion criteria:

- Aspirate from all salivary gland lesions and corresponding histopathological specimens

Exclusion criteria:

- Smears with low cellularity
- Hypocellular smear
- Smears obscured by blood, mucus and inflammatory cells.
- Inadequate specimen

Methodology and Technique Used

FNAC was performed using 23-24gauge needle and 10 ml syringe applying negative pressure. Smears were either wet fixed or air fixed and stained by Hematoxylin and Eosin & Giemsa respectively. The histopathological specimens were fixed overnight in 10 percent formalin and subjected to gross examination, processing, paraffin embedding, section cutting staining by Hematoxylin and eosin, mounting by DPX (Figure 1).

Hematoxylin And Eosin Staining

1. Fix in isopropyl alcohol – 20 minutes
2. Hematoxylin – 5 minutes
3. Blueing in tap water – 10 minutes
4. Eosin – 3 dips
5. Rinse in tap water
6. Dry, Xylene, Mount with DPX

Maygrunwald Giemsa Stain:

It is a mixture of two neutral stains. May Grunwald stain is composed of an acidic stain (eosin) and a basic stain (methylene blue) Giemsa stain is composed of eosin and metachromatic stain.

Procedure:

1. Smears are air dried
2. May grunwald stain for 2 min
3. Blueing for 5 minutes
4. Giemsa stain for 3 minutes
5. Blueing for 5 minutes
6. Dry , xylene, DPX mount

Advantages of MGG staining:

1. Cell morphology is well preserved.
2. Cytoplasmic details are suboptimal.

3. Nuclear characteristic of crisp chromatin is better appreciated.
4. Air-drying artifacts are less compared to wet fixed smears.
5. Overall staining is good.

Results

The present study includes the age group from 20–70 years. The mean age of patients was 48.3 yrs. The predominance of males about 60% of cases (table 1). Based on clinical findings, clinical diagnosis was made in all 50 cases. Impression obtained was that incidence of non-neoplastic and benign lesions were higher (92%) than malignant (8%) (table 2). Based on cytological findings, among the benign neoplastic lesions, pleomorphic adenoma was the most common constituting about 36%. Mucoepidermoid carcinoma is the most common malignant neoplasm constituting about 2% (table 3). In the present study, Histopathologically pleomorphic adenoma is the most common benign neoplasm Constituting about about 42%. Mucoepidermoid carcinoma is the most common malignant neoplasm constituting about 14% (table 4). The diagnostic accuracy of benign lesions & malignant lesions was predicted to be 87% & 78% respectively (table 5 & 6).

Discussion

Major Salivary gland lesions are common and the associated histopathology is extremely varied and complex due to the presence of non-neoplastic lesions, epithelial and non-epithelial neoplasms, metastatic tumors and lymphomas. Patients referred for FNAC may complain of a palpable mass with or without pain in the head and neck region, or some cases present with partial paralysis or paresthesia commonly involving the facial nerve. The mass may be palpated by a clinician or detected on imaging studies. Clinical examination should not be ignored in salivary gland lesions, because the cytological results are useful in both surgical planning and patient counselling. Preoperative knowledge of the malignant nature of the tumor may modify the postoperative course.

Prior to the procedure, the cytopathologist should have information on the clinical features including duration, associated pain, facial paralysis and cervical lymphadenopathy for accurate interpretation. Fine needle aspiration has some disadvantages like bleeding, squamous metaplasia, fibrosis and necrosis in the final histopathological examination. But, it is accepted that these complications do exist which usually, do not interfere with the final diagnosis. Among the benign lesions pleomorphic adenoma is the most common lesion and constitute about 42 % of cases. This data is similar to the observations made by many authors.

Kakoty et al (2017)⁵ reported an incidence of 44% of cases and Sharma et al (2015)⁶ reported an incidence of 68.7% of the total cases of pleomorphic adenoma. The present study showed a diagnostic accuracy of 87 % for pleomorphic adenoma, which were significantly better than that observed in the Malaysian J Pathol (2017)³ reported a diagnostic accuracy of 76% of the total cases. In the present study about 4 cases given a differential diagnosis of pleomorphic adenoma / low grade mucoepidermoid carcinoma is proved to be mucoepidermoid

in histopathology. The potential pitfall occurs when the matrix is thin and mucoid along with bland epithelial cells. This is particularly challenging in the presence of squamous or mucinous metaplastic cells. Swati Sahni et al (2017)⁷ had an interpretation difficulty in few case of pleomorphic adenoma harbouring mucin making a potential trap leading to erroneous diagnosis of mucoepidermoid carcinoma. Kakoty S et al (2017)⁵ suggested that, the presence of goblet cells or squamous metaplasia in pleomorphic adenoma should be approached cautiously as it could be low grade mucoepidermoid carcinoma. In the present study, about 2 cases reported with differential diagnosis of warthin's tumor /mucoepidermoid carcinoma was proved to be mucoepidermoid in histopathology. Swati Sahni et al (2017)⁷ reported that predominance of lymphoid cells in cases of warthin's tumor may lead to a misdiagnosis of lymphoepithelial cyst.

Another case of warthin's tumor is proved to be oncocytoma in histopathology. Oncocytoma consists of epithelial cells only and lack the dirty cystic background. Oncocytic features can be an accompanying finding in many salivary gland neoplasms like myoepithelioma, mucoepidermoid carcinoma and even pleomorphic adenoma. All cases of warthin's tumor should be distinguished from intra parotid lymph nodes, lymphoepithelial sialadenitis, lymphoepithelial cyst and oncocytoma. Lymphoepithelial sialadenitis lacks the oncocytic epithelium and dirty cystic debris. Among the malignant lesions, mucoepidermoid was the most common constituting about 14% of cases. Similar observations were reported by Sharma M et al (2017)⁷, Yogambal et al (2015)², Kakoty S et al (2017)⁵, S V Ramana et al (2017)⁸. It has a diagnostic accuracy of 66% which is significantly more than other studies.

The present study confirms the increased incidence of benign neoplastic lesions compared to its malignant counterpart. In the study there was almost perfect agreement between the cytological and histological diagnosis and a fairly good accuracy. Some of the common salivary gland lesions like various cysts, basal cell adenoma, Acinic cell carcinoma, Adenoid cystic carcinoma, Epithelial-myoepithelial carcinoma were not encountered in the present study as it had a limitation period of one-year inspite of an effective study population.

Conclusion

The present study confirms the usefulness of FNAC as a safe and economic procedure in distinguishing benign and malignant salivary gland lesions which are of utmost value in planning the further management of the patient.

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Table 1: Demographic profile of patients

DEMOGRAPHIC PROFILE	No. of patients
Age (yrs) (mean±SD)	48.3±10.78
GENDER	
Male	30 (60%)
Female	20 (40%)

Table 2: Clinical diagnosis of patients

Lesions	No. of patients (%)
Non-neoplastic lesions	15 (30%)
Pleomorphic adenoma	31 (62%)
Malignant lesions	4 (8%)
Total	50 (100%)

Table 3: Cytological diagnosis of patients

Cytological diagnosis	No. of patients (%) (N=50)
Pleomorphic adenoma	18 (36%)
Warthin's tumor	9 (18%)
Inflammatory lesions	1 (2%)
Chronic sialadenitis	9 (18%)
Lymphoepithelial cyst	5 (10%)
Mucoepidermoid carcinoma	1 (2%)
Salivary duct carcinoma	1 (2%)
Pleomorphic adenoma/ Mucoepidermoid carcinoma	4 (8%)
Warthin's tumor/ Mucoepidermoid carcinoma	2 (4%)

Table 4: Histopathological diagnosis of patients

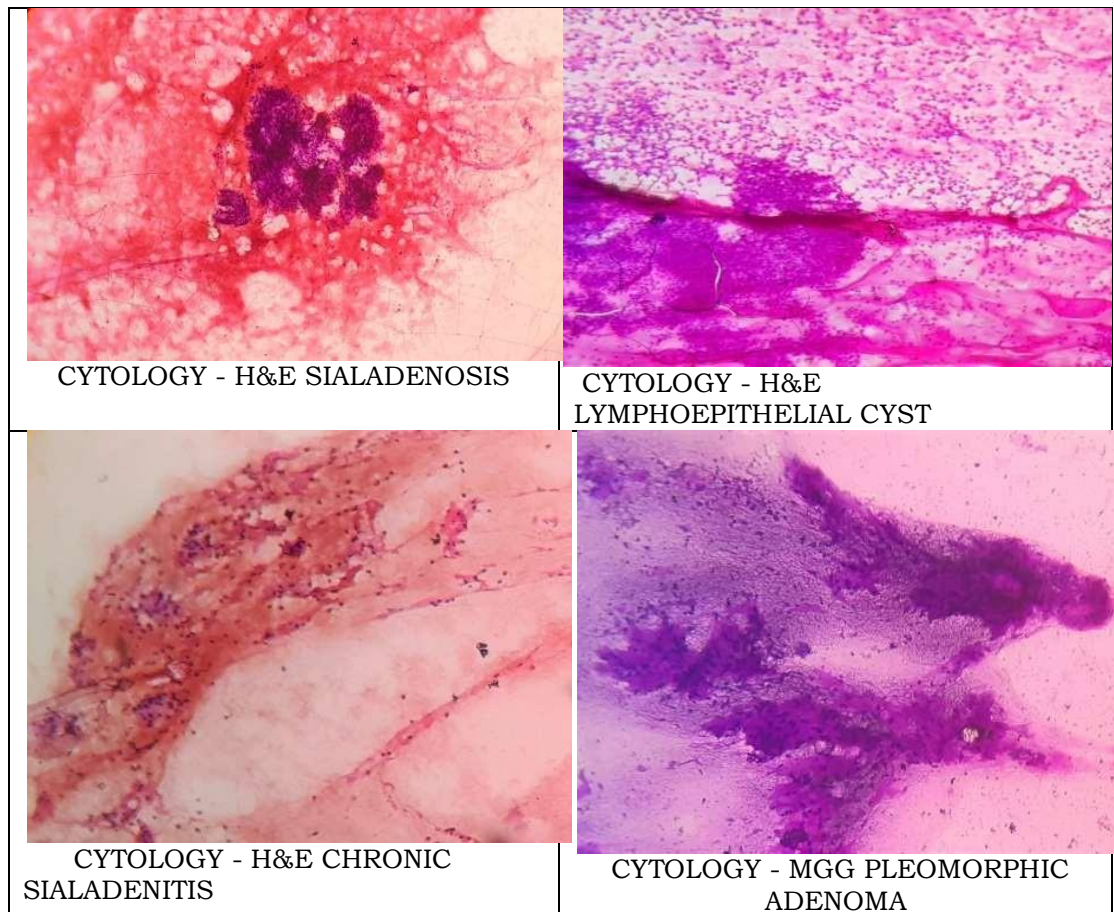
Histopathological diagnosis	No. of patients (%) (N=50)
Pleomorphic adenoma	21 (42%)
Warthin's tumor	9 (18%)
Myoepithelioma	1 (2%)
Chronic sialadenitis	8 (16%)
Lymphoepithelial cyst	1 (2%)
Mucoepidermoid carcinoma	7 (14%)
Oncocytoma	1 (2%)
Salivary duct carcinoma	2 (4%)

Table 5: Diagnostic accuracy in benign neoplastic lesions of salivary gland

FNAC	HPE		Total	Sensitivity	Specificity	PPV	NPV
	Positive	Negative					
Positive	27	0	27	87%	100%	100%	69%
Negative	4	9	13				
Total	31	9	40				

Table 6: Diagnostic accuracy in malignant neoplastic lesions of salivary gland

FNAC	HPE		Total	Sensitivity	Specificity	PPV	NPV
	Positive	Negative					
Positive	7	0	7	78%	100%	100%	94%
Negative	2	31	33				
Total	9	31	40				



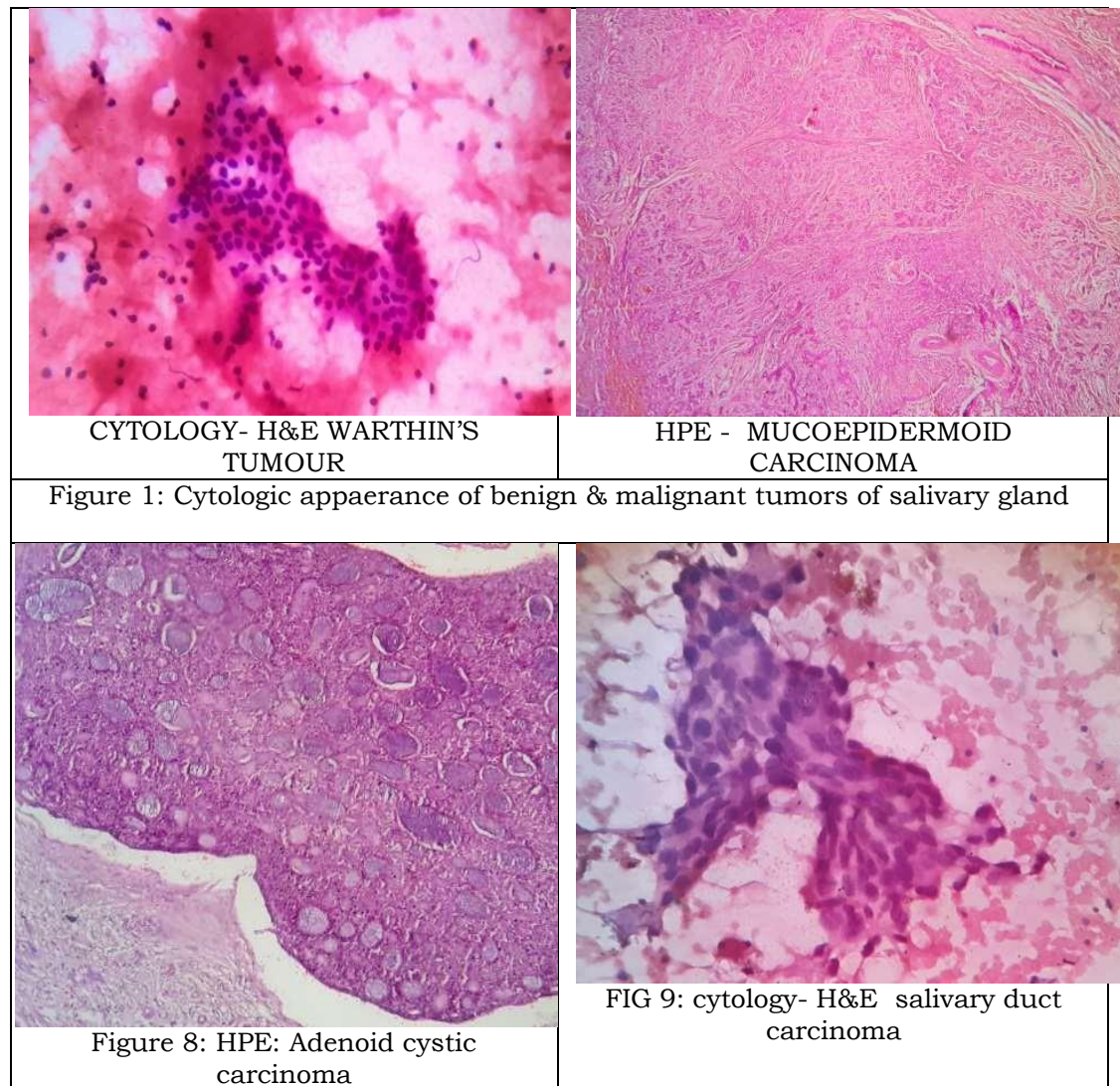


Figure 2: Different benign and malignant lesion