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ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN SALIVARY GLAND PATHOLOGY AND ITS HISTOPATHOLOGICAL CORRELATION: A FIVE YEAR DESCRIPTIVE STUDY IN A TERTIARY CAR CENTRE

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ABSTRACT

Background and objectives: FNAC is one of the useful method for evaluating suspicious salivary glands lesions mainly of its, minimum morbidity, rapid turnaround time, high specificity, sensitivity and low cost. Salivary gland neoplasm account for 2-6.5% of all the neoplasm of the head and neck. Fine needle aspiration cytology (FNAC) is being increasingly used in the diagnosis of salivary lesions. The objective of this study was to evaluate the diagnostic accuracy, sensitivity and specificity of FNAC in various salivary gland lesions in correlation with their histopathology, which helps in the appropriate therapeutic management.

Methods: This study was a descriptive study done in Department of pathology, Stanley medical college, Chennai, India for duration of 5 years from January 2010 to December2014. During the study period 393 cases of FNAC of salivary gland lesions were performed. Formalin fixed (10%), surgically resected specimens were received, they were processed and slides were prepared for histopathological diagnosis. The stained cytological and histopathological slides were studied, analyzed and correlated. Results: The cytomorphological features were studied and analyzed and the following lesions were observed: Non neoplastic (65), In neoplastic benign (157), malignanat (29) and No specific typing(07).

In benign following neoplasm were observed: Pleomorphic adenoma (143), Warthin's tumour (10) and basal cell adenoma (04). In malignant neoplasm following neoplasm were observed: Mucoepidermoid carcinoma (23), Adenoid cystic carcinoma (04) and Acinic cell carcinoma (02). Conclusion: The overall sensitivity, specificity and the diagnostic accuracy for non neoplastic lesions were 100%, 100% and 100% respectively. The overall sensitivity, specificity and the diagnostic accuracy for benign neoplasm were 99.35%, 98.11% and 71.46% respectively. The overall sensitivity, specificity and the diagnostic accuracy for malignant neoplasm were 94.74%, 99.55% and 98.83% respectively. Hence, the appropriate therapeutic management could be planned earlier. This study documents that FNAC of the salivary gland neoplasm is accurate, simple, rapid, inexpensive, well tolerated and harmless for the patient.

Introduction:

The salivary gland system includes three pairs of major glands- parotid, submandibular and sublingual and many minor glands in the sub mucosa of oral cavity. Minor salivary glands can be found in the lips, floor of mouth, gingiva, cheek, hard & soft palates, tongue, tonsillar areas and oropharynx(1).

The lesions of salivary glands are commonly encountered clinical problems. They range from non neoplastic lesions to benign and malignant tumours. (2). Fine needle aspiration (FNA) cytology of the salivary gland is an accepted, sensitive and specific technique in the diagnosis of both non-neoplastic and neoplastic lesions.(3) It is a relatively safe and painless procedure for a rapid diagnosis.

FNA of the salivary glands can distinguish inflammatory lesions from neoplastic conditions, lymphomas from epithelial malignancies and primary tumors from metastatic tumors. Many clinicians believe that FNA is a reliable and useful technique for the management of their patients with salivary gland lesions. (4–9)

A review of the recent reported series found that the diagnostic sensitivity of FNAC varied from 81-100%, that the specificity varied from 94-100% and that the diagnostic accuracy varied from 61- 80%.(10-11).

Hence, the appropriate therapeutic management could be planned earlier, whether it was local excision for benign neoplasm, conservative management for non-neoplastic lesions, radical surgery for malignant tumors and chemotherapy or radiotherapy for metastasis and lymphoproliferative disorders (12).

The aim of this study is to present our five-year tertiary care hospital experience and evaluate if FNA is a valuable diagnostic tool for the patients with Salivary gland masses.

Materials and methods:

This study was a descriptive study done in Department of pathology, Stanley medical college, Chennai, India for duration of 5 years from January 2010 to December2014. During the study period 393 cases of FNAC of salivary gland lesions were performed out of which in 258 cases cytohistopathological correlation were possible. Cytology smears were fixed in isopropyl alcohol for Hematoxylin and Eosin stain. Surgical specimens received in the Department of Pathology were fixed in 10% neutral buffered formalin. Slides were stained using Hematoxylin and Eosin. The slides were examined and diagnosis was made and cytohistopathological correlation was made. FNAC diagnoses were divided into non-neoplastic lesions, benign neoplasms and malignant lesions. Available data were analyzed using SPSS 13.

Results:

Age range varied from 8-80 years. Majority of them were in the age group of 21-50 years (182 cases-70.54%). Non neoplastic lesions where more prevalent in age group between 10-30 years. Most affected gland was parotid which is involved in 77.51% of cases followed by submandibular gland. There were 193 neoplastic lesions (74.80%) and 65 (25.19%) non neoplastic cases. (Table 1)

Of the 193 neoplastic lesions 157(60.85%) were benign and 36(13.95%) were malignant. Chronic sialadenitis was the most common non neoplastic lesion. Most common benign neoplasm was pleopmorphic adenoma(Figure1) and mucoepidermoid carcinoma(Figure 2) was the most common malignant neoplasm. (Table 1)

In 5 cases a diagnosis of neoplastic lesion was given on FNAC and specific typing could not be done. In non neoplastic category, 50 (19.37%) cases of chronic sialadenitis,03 cases of Kimura's disease, 02(0.77%) cases of sialadenosis, 05(1.93%)cases of acute inflammatory lesion (abscess and 05 cases (1.93%) of cystic lesion were observed. However the following is the correlation observed between the FNA cytology and histopathological diagnosis of our study. (Table 2)

Out of 258 cases 237 cases (91.86%) had same cytohistopathological diagnosis whereas 21 cases (8.139%) had cytohistological disagreement.

Diagnostic reliability was judged based on sensitivity, specificity and accuracy. Of the 258 cases in cytology the sensitivity, specificity and diagnostic accuracy in detecting non neoplastic lesions were 100%, 100% and 100% and for benign tumors were 99.35 %, 98.11 % and 71.46% respectively. For malignant tumours, sensitivity specificity and accuracy were found to be 94.74 %%, 99.55 %and 98.83%respectively.(Table 3)

Non neoplastic		Neoplasm				
		Benign		Malignant		No specific typing
Chronic sialadenitis	50(19.37%)	Pleomorphic adenoma	143(55.42%)	Mucoepidermoid carcinoma	23(8.91%)	
Kimura's disease	03(1.16%)	Warthin's tumour	10(3.87%)	Adenoid cystic carcinoma	04(1.55%)	
Sialadenosis	02(0.77%)	Basal cell adenoma	04(1.55%)	Acinic cell carcinoma	02(0.77%)	
Abscess	05(1.93%)					
Cystic lesion	05(1.93)					07(2.71%)
Total	65(25.19%)		157(60.85%)		29(11.24%)	07(2.71%)

Table 1: FNAC diagnosis of salivary gland swelling

Non neoplastic		Neoplasm			
		Benign		Malignant	
Chronic sialadenitis	43(16.66%)	Pleomorphic adenoma	142(55.03%)	Mucoepidermoid carcinoma	25(9.68%)
Kimura's disease	03(1.16%)	Warthin's tumour	08(3.10%)	Adenoid cystic carcinoma	06(2.32%)
Tuberculosis	05(1.93%)	Basal cell adenoma	04(1.55%)	Acinic cell carcinoma	03(1.16%)
Sialadenosis	02(0.77%)			Squamous cell carcinoma	03(1.16%)
Abscess	05(1.93%)			Pleomorphic low Grade adenocarcinoma	02(0.77%)
Cystic lesion	05(1.93)				
Necrotizing sialo metaplasia	02(0.77%)				
Total	65(25.19%)		154(59.68%)		39(15.11%)

Table 2: Histopathological diagnosis of salivary gland swelling

Lesions	Sensitivity	Specificity	Accuracy
Non neoplastic	100%	100%	100%
Benign	99.35 %	98.11 %	71.46%
Malignant	94.74 %	99.55 %	98.83%

Table 3: FNAC sensitivity, specificity and accuracy in salivary gland lesions

Discussion:

The FNAC technique has been widely used as a diagnostic tool for the management of various head and neck lesions. In view of many other workers FNAC is considered as an accurate and safe modality of diagnosis while others argued that due to its false positive & false negative results, it has a minimal role in the clinical management of the patients.(13). However the pre-operative FNA cytology helps to distinguish between the benign and malignant lesions of the salivary glands which helps to plan the surgical extent in every case.

During the study period 393 patients underwent fine needle aspiration of salivary gland lesions, 258 of these patients underwent surgery and subsequent histopathological examination. The age range in this study varied from 8-80 years. In our study slight male preponderance is observed i,e. 151 Males and 107 females. Parotid gland was involved in majority 77.51% of cases.

Chronic sialadenitis, pleomorphic adenoma and mucoepidermoid carcinoma were the most common non neoplastic, benign neoplasm and malignant neoplasm respectively. Pleomorphic adenoma is the most common salivary gland tumor and comprises about 79% of the major and 72% of minor salivary gland tumors.(14)

Klijanienko J et al in his study found mucoepidermoid carcinoma is one of the most common malignant tumors of salivary glands.(15). Twenty one of 36 cases had cyto-histological disagreement. Cystic presentation, squamous metaplasia were common pitfalls.

Presence of mucin in FNA aspirates that otherwise appeared typical of pleomorphic adenoma turned out to be case of mucoepidermoid carcinoma. An article by Handa U et al states that cystic degeneration and mucin production are common in pleomorphic adenoma.(14)

The sensitivity, specificity and accuracy for non-neoplastic lesions were 100%, 100%, 100%, for benign neoplasms were 99.35 %, 98.11 %, 71.46% and for malignant neoplasms were 94.74 %, 99.55 %, 98.83% respectively. According to the various authors, the accuracy of needle aspiration in malignant tumors range from 80.4% to 97%, sensitivity from 54% to 97.6% and specificity from 86% to 100% respectively.(16-17).

Conclusion:

FNAC can be used as preoperative investigations of salivary gland lesions. It can be used to differentiate benign from malignant lesions preoperatively. Type specific diagnosis are more difficult in malignant cases, however as seen from this study absence of malignancy can be correctly identified in fine needle aspirations.

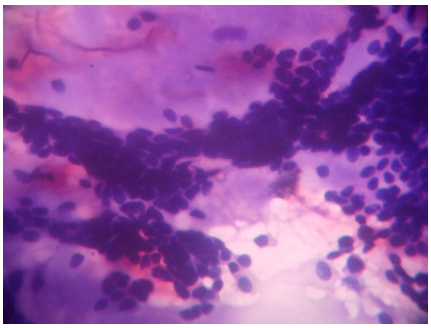

Figure 1: Cytology of Pleomorphic adenoma, H & E stain, 40X

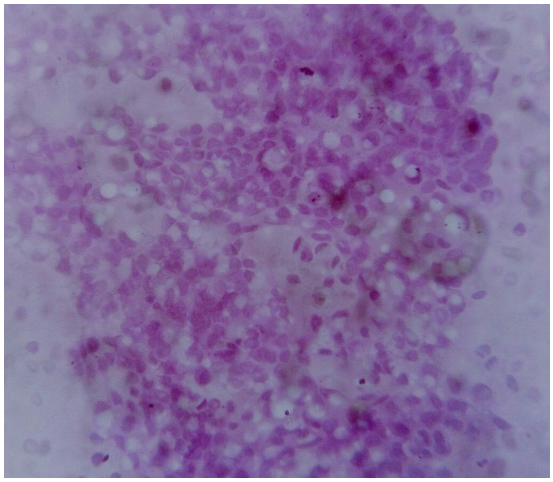

Figure 2: Cytology of Mucoepidermoid carcinoma, H & E stain, 40X

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