



ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF SALIVARY GLANDS NEOPLASM WITH HISTOLOGICAL AND CLINICAL CORRELATION

Pathology

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ABSTRACT

Salivary gland tumors are heterogenous group of neoplasm in head and neck area. The tumors have complex morphological appearance and different clinical behaviour, a fact that render their diagnosis difficult. Though histopathological diagnosis is gold standard for confirmation of fine needle aspiration cytology (FNAC) findings, FNAC is an excellent first-line tool in providing an early diagnosis.

The present study is to elucidate the features of salivary gland neoplasm with respect to age, gender, site and clinical presentation, and to correlate the cytopathological feature of salivary gland neoplasm with their histopathological findings.

The present study was done at the Department of Pathology, Rajendra Institute of medical sciences, Ranchi between July, 2018 to September 2019. FNAC was done using 24 gauge needle and 10 ml syringe and smears were stained with Haematoxylin & Eosin (H&E) and Giemsa stains. Histopathology was assessed on routine H&E stained paraffin sections. Cyto-histo correlation was done and overall diagnostic accuracy was calculated.

The diagnostic accuracy of FNAC in salivary gland neoplasm was 92.3%. Mean age was 47.8yrs with range from 10-78 years; with male preponderance and parotid was found to be the most common site for salivary gland neoplasm. The most common neoplastic lesion was pleomorphic adenoma.

Fine Needle Aspiration Cytology is thus a safe, reliable, quick, convenient and accurate method of diagnosis and should be considered as one of the first line of investigations in the evaluation of salivary gland lesions.

KEYWORDS

INTRODUCTION

Salivary gland tumors have created much debate because of their variability in structure, clinical presentation and behavior. They are challenging because of their relative frequency, remarkable variability in morphology, clinical features and biological behavior. Salivary gland tumors are relatively uncommon and represent less than 2% of all tumors in humans.¹ Fine needle aspiration cytology (FNAC) is a popular method for diagnostic evaluation of salivary gland masses due to their superficial location and easy accessibility for the procedure. It is a major diagnostic tool and is of great relevance in head and neck lesions including salivary glands.² Fine needle aspiration cytology may be useful in evaluating poorly defined salivary gland masses, and to confirm clinically suspicious malignant disease for proper counselling of patients before surgery. Fine needle aspiration cytology also may be useful in diagnosing metastatic carcinoma, especially with sub mandibular masses, and to help in distinguishing surgically treatable tumors from non-surgical pathological conditions, such as lymphoma. Though history and clinical examination remain important in this respect but because of overlapping clinical features sometimes it becomes difficult to differentiate between benign and malignant tumors. Considering the lack of characteristic clinical and radiological features for definitive diagnosis for salivary gland tumors, FNAC generally plays an important role in pre-operative diagnosis of these tumors. FNAC cannot comment on capsular or perineural invasion. Thus, histopathology continues to be the gold standard method for diagnosis of salivary gland neoplasms.

II. MATERIAL AND METHODS

A total of 52 cases of salivary gland neoplasm were included for clinical, cytological and histological findings.

Study Design: Cross-sectional Descriptive study

Study Location: Department of Pathology at Rajendra Institute of Medical Sciences, Ranchi

Study Duration: July 2018 to September 2019

Sample size: 52 patients.

INCLUSION CRITERIA:

- Those patients who have given informed consent for participation in study.
- The patient suspected to have salivary gland tumor that was neoplastic (benign and malignant) presenting with swelling in neck and oral cavity.
- Previously diagnosed case of other head and neck malignancy,

now presenting with major salivary gland swelling proved radiologically.

Exclusion Criteria:

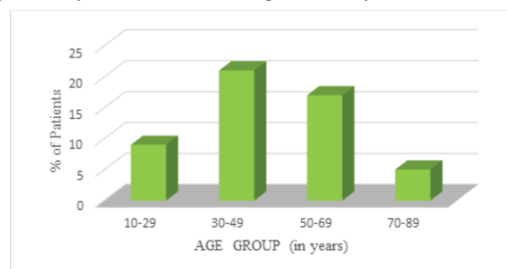
- Patient who refused to give consent to be a part of the study.
- The patient with salivary gland swelling of inflammatory and non-inflammatory origin not proved to be neoplastic.

III. Observations and Results

AGE DISTRIBUTION

Age Group (in years)	Number of cases	%
10-29	09	17.3%
30-49	21	40.4%
50-69	17	32.7%
70-89	05	9.6%
Total	52	100.0%

The mean age (mean \pm s.d.) of the patients was 47.81 \pm 16.86 years with range 10 - 78 years and the median age was 45.5 years.



GENDER DISTRIBUTION

	Number	%
Male	35	67.3%
Female	17	32.7%
Total	52	100.0%
Male:Female	2.05:1.0	

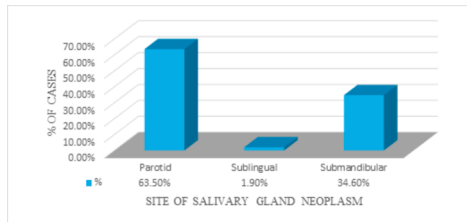
67.3% of the cases were male patients and 32.7% female patients.

Distribution of site of salivary gland tumors

Site	Number	%
Parotid	33	63.5%

Site	Number	%
Sublingual	1	1.9%
Submandibular	18	34.6%
Total	52	100.0%

Most common site of salivary gland tumor was parotid (63.5%).



DISTRIBUTION OF OVER ALL CYTOLOGICAL FINDINGS

Findings of FNAC	Number	%
Acinic Cell Carcinoma	1	1.9%
Adenoid Cystic Carcinoma	4	7.7%
Mucoepidermoid Carcinoma	5	9.6%
Pleomorphic Adenoma	30	57.7%
Oncocytoma	1	1.9%
Poorly differentiated Carcinoma	1	1.9%
Squamous Cell Carcinoma	7	13.6%
Warthin's Tumour	3	5.7%
Total	52	100.0%

FNAC finding are as follows

Pleomorphic Adenoma (57.7%) followed by Squamous Cell Carcinoma (13.6%) and Mucoepidermoid Carcinoma (9.6%), Adenoid Cystic Carcinoma (7.7%), Warthin's tumor (5.7%), Acinic cell carcinoma (1.9%), poorly differentiated carcinoma (1.9%) were the cytological findings.

Comparison of overall findings of cytology and histology

Comparison of overall findings	Number	%
Concordant	48	92.3%
Discordant	4	7.7%
Total	52	100.0%

Most of the findings of cytology and histology were concordant (92.3%). Only 7.7% cases were found to be discordant.

Sensitivity and specificity of FNAC compare to HP Finding:

Comparison	Number	%
TP	31	59.7%
TN	17	32.7%
FN	3	5.7%
FP	1	1.9%
Total	52	100.0%

TP-True Positive, TN-True Negative, FN- False Negative, FP- False Positive

Diagnostic Accuracy = $(TP+TN) / \text{TOTAL CASES} \times 100 = 92.3\%$

Sensitivity = $TP / (TP+FN) \times 100 = 91.2\%$

Specificity = $TN / (TN+FP) \times 100 = 94.4\%$

Positive Predictive Value = $TP / (TP+FP) \times 100 = 96.9\%$

Negative Predictive Value = $TN / (TN+FN) \times 100 = 85.0\%$

Most of the cases were found as true positive (59.7%) and true negative (32.7%) followed by false negative cases (5.7%) and false positive (1.9%).

IV. DISCUSSION

FNAC is a safe, simple and effective method in the management of patients with salivary gland lesions.³ It is a relatively non traumatic procedure that can quickly provide important preoperative information.⁴ Now a days, it is being widely employed in the investigation of salivary gland masses at relatively low cost and minimum risk to the patient. The mean age (mean \pm s.d.) of the patients was 47.81 ± 16.86 years with range 10 - 78 years and the median age was 45.5 years. Vaidya S et al⁵ observed the age range from 6-73 years with a median age of 38 years. Among the 52 cases included in the present study, 67.3% of the cases were male patients and 32.7% female patients, with male to female ratio of 2.05:1. Gogoi and gogoi⁶ found male to female ratio 1.12:1. The present study of 52 cases include variety of salivary gland tumours, both benign and malignant. Out of total cases, Parotid tumours (both benign and malignant) was

63.5% (33 cases), submandibular tumours was 34.6% (18 cases) and sublingual tumour 1.9% (1 case). Islam et al⁷, Achalkar et al⁸ and Janu Talukdar et al⁹ also observed similar findings.

The most common benign tumour was pleomorphic adenoma 27(51.9%) and the most common malignant tumour was adenoid cystic carcinoma 7(13.5%) and squamous cell carcinoma 7(13.5%). Out of 34 benign cases 31 cases was confirmed by histopathology as benign and 3 cases were detected as malignant. Out of 18 malignant cases 17 cases were confirmed by histopathology as malignant and one case was detected as benign; the diagnostic accuracy was 92.3%. Das DK et al¹⁰ had diagnostic accuracy of 91.1%.

V. CONCLUSION

In our study, we found salivary gland tumours can occur at any age, patient age ranges from 10-78 years with mean age 47.81 ± 16.86 years, and median age of the patients were 45.5 years. Male to female ratio was 2.05:1. Majority of salivary gland tumours arises in parotid gland; and parotid gland is the most common site for benign tumor, while malignant tumours were common in submandibular gland as well as parotid gland. The overall diagnostic accuracy of FNAC in this study was 92.3% with a sensitivity of 91.2% and a specificity of 94.4% for detecting malignancy. Fine needle aspiration cytology is a safe and economic procedure with acceptable diagnostic accuracy. It has an important role in the preoperative evaluation and categorization of various salivary gland lesions. Proper sampling of lesions and adequate cellularity of the smears are the pre-requisites for an accurate diagnosis.

VI. REFERENCES

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