

Salivary gland tumors: Role of fine needle aspiration cytology (FNAC) as first line investigation.

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Introduction

Fine needle aspiration cytology (FNAC) is a cytodiagnostic method based on morphologic findings of individual and small group of cells aspirated using a fine needle. ⁽¹⁾ Fine-needle aspiration can be performed either with or without imagistic assistance (ultrasound/ CT guided). Fine Needle Aspiration Cytology (FNAC) is shown to be a safe and reliable method by providing a minimally invasive means for rapid diagnosis of lesions, and if necessary, aspiration can be done immediately. ^(2,3) This technique has become a diagnostic test of choice for salivary gland lesions. The technique has very few contraindications and risks, and it is suitable for use in an ambulatory setting. The role of FNAC in suspected salivary gland swellings is two folds. Firstly, to confirm the origin, as preauricular and submandibular lymph node swellings can mimic salivary gland neoplasm clinically and secondly to get a preliminary diagnosis

about the nature of the disease process before embarking on definite management plan. FNAC differentiates non-neoplastic lesions from neoplastic lesions thus eliminating the need for surgical intervention in these lesions which can be treated conservatively. ⁽³⁾ The global annual incidence of salivary gland tumors varies from 0.4-13.5 cases per 100,000 population. ⁽⁴⁾ FNAC serves to determine the nature of the lesion which can be divided into inflammatory, benign and malignant and in some cases, the specific diagnosis is given. ^(5,6) Malignant salivary gland neoplasms account for more than 0.5% of all malignancies and approximately 3% to 5% of all the head and neck cancers. ⁽⁷⁾ Pleomorphic adenoma of salivary glands is the most frequently encountered benign tumor. ^(8,9) Adequate cellularity of the smears and proper sampling of lesions is the pre-requisites for an accurate diagnosis. ⁽⁹⁾ The high sensitivity, specificity and diagnostic accuracy of FNAC

confirm its vital role to provide the best possible initial evaluation, which in turn guide the treatment options. ⁽¹⁰⁾ FNAC has become a cornerstone diagnostic tool in head and neck swellings. ^(11,12) The aim of the present study was to study the cytological spectrum of lesions of salivary glands, to evaluate the role of fine needle aspiration cytology as a diagnostic investigation.

Methodology

This prospective study was performed in Government Gandhi Nagar Hospital Jammu on patients with suspected salivary gland swelling, who were referred for FNAC from the department of ENT, Gandhinagar hospital over a period of 1year. The total number of FNAC’s performed were 52. Relevant clinical details pertaining to age, sex, anatomical site, duration of swelling was obtained in all the cases and findings of local examination done were noted. All the aspiration were performed using 23–24-gauge needle, with suction being provided by a 10 ml syringe. The character of aspirate was noted. Smears were prepared and were stained with MGG and PAP stain. The stained smears were examined for cytomorphological finding and diagnosis. The present study was undertaken to categorize the cytomorphology of the salivary gland lesions on FNAC and to assess the accuracy of FNAC in arriving at a diagnosis.

Results

52 patients with salivary gland swelling were included in our study. The age ranged from 9 years to 73 years with majority of cases in 4th decade of life.

Table 1: Site wise distribution of salivary gland swellings.

| Sn. | Site | No. of Cases |
|-----|----------------------|--------------|
| 1. | Parotid gland | 28(54%) |
| 2. | Submandibular gland | 22(42%) |
| 3. | Minor Salivary Gland | 2(4%) |

The most common site of involvement was parotid gland with a frequency of 54%, followed by submandibular gland 42%(22cases). Least no of cases 2(4%) were observed in minor salivary gland (palate).

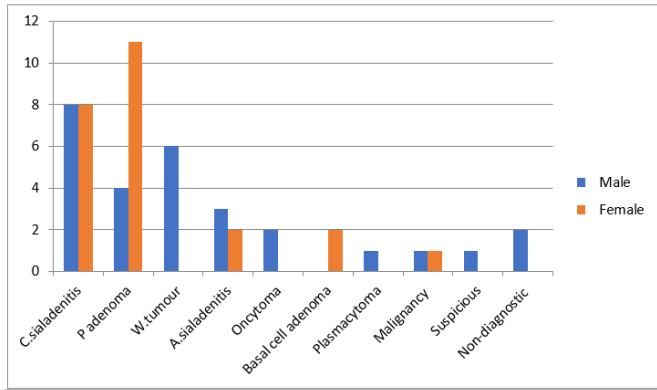
Table 2: Cytological diagnosis and sex wise distribution of salivary gland tumors.

| Cytological Diagnosis | Male | Female | Total Cases |
|-----------------------|------|--------|-------------|
| Chronic Sialadenitis | 08 | 08 | 16 (30.7%) |
| Pleomorphic Adenoma | 04 | 11 | 15 (28.8%) |
| Warthin Tumor | 06 | 0 | 06 (11.5%) |
| Acute Sialadenitis | 03 | 02 | 05 (9.6%) |
| Oncocytoma | 02 | 0 | 02 (3.8%) |
| Basal Cell Adenoma | 0 | 02 | 02(3.8%) |
| Plasmacytoma | 01 | 0 | 01(1.9%) |
| Malignancy | 01 | 01 | 02(3.8%) |
| Suspicious | 01 | 0 | 01(1.9%) |
| Non-Diagnostic | 02 | 0 | 02(3.8%) |
| Total | 28 | 24 | 52 |

Out of a total of 52 cases, 28 cases (53.8%) were males while females accounted for 24 cases (46%) with male to female ratio 1.16:1. Sialadenitis was equally distributed among males and females, whereas pleomorphic adenoma was predominantly reported in females ,11 out of 15 cases. Similarly, Warthin tumor showed male preponderance with 6 males. 2 cases of oncocytoma and 1 case of plasmacytoma (hard palate) were also reported in males, while 2 cases of basal cell adenoma were reported in females.

In our study, malignant tumors were equally distributed in both sexes. Two cases of mucoepidermoid were reported, one in 56 years old male while other case was reported in 67 years old female. On cytological evaluation, 1 case (1.9%) was reported suspicious of malignancy with no definite features of malignancy while inadequate specimen obtained in 2 cases (3.8%) and reported as inconclusive.

Fig 1: Sex wise distribution of salivary gland tumors.



Discussion

Salivary glands, specifically parotid and submandibular gland presents as a common problem. FNAC is the method of choice for tumors located in the salivary glands. (3,10) FNAC is considered safe, simple, rapid, repeatable and relatively cheap. (2,3) It leave no scars and there is no risk of seeding tumors along the needle tract. (13) FNAC diagnosis is needed to plan appropriate treatment protocol ranging from conservative surgery for non-neoplastic lesions, wide local excision for benign lesions, radical surgery for malignant lesions and chemotherapy, radiotherapy for metastasis. Even in salivary gland tumors that present with many diagnostic difficulties, accuracy of 90% has been reported. Literature review revealed a wide variation in the sensitivity and specificity of FNAC for salivary gland swelling in different populations and setups. (14-16) Zerpa et al (17) studied 93 cases of parotid gland tumors, revealing a sensitivity and specificity of 57% and 95% respectively. On the other hand, Pastore et al (18) found a sensitivity and specificity of 83% and 93% respectively. They evaluated 357 cases of salivary gland lesions. In the present study, on cytological evaluation, adequate aspirations were seen in 96.2% cases while inadequate aspirations were seen in 3.8 % cases.

In our study the age group of patients ranged from 9 to 73years. The findings are similar to a study by Issac et al (19) and Kakoty et al (20) in which the age of the patients varied from 13 to 85 years with a maximum number of patients falling in the age group of 30 to 50 years. FNAC has an edge over biopsy as cytological diagnosis can be made within 24 hours whereas histopathology may take 5-7 days. (21) FNAC provides useful information on the management of salivary gland lesion and prevent unnecessary surgery in case of non-neoplastic lesions and identification of malignancy helps the surgeon in deciding type and extent of surgery. (22)

Majority of cases in our study were seen in 4th decade of life. Males accounted for majority of cases with M:F ratio of 1.16:1.

In the present study, non-neoplastic lesions accounted for majority of cases (90%) while malignancy constituted only 3.8% (2 cases). The results of our study are in concordance with studies by Verma S et al (23) who reported 31.75% benign and 12.70% malignant aspirates in their study.

In the non-neoplastic salivary gland lesion cases, inflammatory lesions were the most common non-neoplastic lesions. Chronic Sialadenitis constituted the majority of non-neoplastic lesions, comprising 30.7% cases. Similar results were obtained in other studies done by divija et al (24) and abdulrauf et al (25) revealing that the most common non neoplastic lesion in salivary gland is sialadenitis. Smears in chronic sialadenitis comprised clusters of ductal epithelial cells along with the presence of lymphomononuclear cells in the background. (26) Among the benign tumors of salivary gland, pleomorphic adenoma was the most common comprising 28.8% followed by Warthin Tumor constituting 11.5%. Stewart et al (27) and Naz et al (3) also documented similar

findings with PA constituting the maximum cases followed by Warthin's Tumor. This is also in concordance with studies done by Divija et al who reported the incidence of pleomorphic adenoma as 74.63% of all neoplasms and 95.91% of benign neoplasms. The pleomorphic adenoma is a notorious neoplasm and is readily identified because of its biphasic pattern, comprising epithelial/myoepithelial cells and magenta chondromyxoid stroma. ⁽²⁴⁾

In our study, two cases of mucoepidermoid tumour (3.8%), were reported, one in 56 years old male other case was reported in 67 years old male. Similar results were observed by Divija et al ⁽²⁴⁾ who reported 11.29% of cases as mucoepidermoid carcinoma in their study. A study conducted by Sushma et al ⁽²⁸⁾ also reported mucoepidermoid carcinoma was the most frequent malignant neoplasm, whereas in a study conducted by Todase et al ⁽²⁹⁾, Adenoid cystic carcinoma was predominant malignancy. The cytological smears from mucoepidermoid carcinoma show presence of mucus producing cells and intermediate cells exhibiting varying degree of atypia according to which the tumor is categorized as low, intermediate and high grade. Low-grade tumor has to be differentiated from Warthin's tumor, benign salivary gland cyst, branchial cleft cyst, sialolithiasis and pleomorphic adenoma with excess of mucoid stroma. ⁽³⁰⁾

Conclusion

It is concluded that FNAC can be widely used in the diagnosis of salivary gland lesions in view of high accuracy & rapid results. It helps in an early diagnosis and in distinguishing benign from malignant lesions and subsequent disease management. It is quick, safe, minimally invasive, cost effective and suitable for use outpatient basis even in peripheral hospitals.

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