

Original Research Article

Cytohistological Study of Salivary Gland Lesions

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Abstract: Salivary Gland lesions include non-neoplastic and neoplastic lesions. The majority of neoplasms are benign. The present study is a prospective study of 65 cases of salivary gland lesions, conducted at Gandhi Hospital/Gandhi Medical College, Hyderabad, Telangana State, India over a period of five years. Parotid gland was the most frequently involved among all salivary glands. The age range of the patients was from 8 to 65 years. Non-neoplastic lesions occurred in all ages, whereas benign tumors were common in adults and malignancies were common in older age groups. There was a slight female preponderance in the ratio of 1.3:1. FNAC was performed with 23/24 gauge needle without local anaesthesia. Air dried and 95% ethyl alcohol fixed wet smears were stained with Giemsa, Papanicoulou and Hematoxylin & Eosin stains. Surgical specimens of these cases fixed in 10% formalin were received at the Department of Pathology. After processing the tissues, sections were cut from the paraffin wax blocks and stained with Hematoxylin and Eosin. Cytohistological correlation was done. The high accuracy, sensitivity and specificity of FNAC is very much helpful as a preoperative procedure in the diagnosis of salivary gland lesions. FNAC is useful for rapid, reliable and early diagnosis of all salivary gland lesions.

Keywords: Salivary gland lesions, Cytohistological correlation, FNAC, rapid, reliable

INTRODUCTION

Salivary glands are exocrine organs responsible for production and secretion of saliva and consist of right and left parotid, submandibular, sublingual glands and the minor salivary glands that are numerous and widely distributed throughout the mouth and oropharynx [1]. Salivary gland neoplasms are a heterogenous group of tumors of the oral and maxillofacial pathology [2, 3]. They comprise from 2 to 3% of all the salivary gland lesions and because of their heterogeneity, different classifications have emerged based on clinical or microscopic criteria [4-8]. The recent and widely used is that proposed by seifert *et al*, [9]. It has been adopted by the WHO [10]. In 1960, Choudhury *et al* in their study identified 1414 cases of salivary gland neoplasms among people living in Minnipolis, of which 51 cases (3.6%) were carcinomas [11]. The sex distribution for the salivary gland cancers is equal and majority of the cases arise in the sixth decade [12]. Fine Needle Aspiration Cytology (FNAC) is a useful method for evaluating suspicious salivary gland lesions due to its low cost, rapid procedure, high

specificity and sensitivity [13]. By cytological examination, lesions can be divided into inflammatory, benign and malignant and if possible, specific diagnosis is given which helps the clinician in planning the management of the lesion [14]. The present study is undertaken to know the frequency of salivary gland lesions and cytohistopathological correlation and to evaluate the role of FNAC in the diagnosis of salivary gland masses.

MATERIAL AND METHODS

The present prospective study is carried out at the Department of Pathology, Gandhi Hospital/Medical College, Hyderabad, Telangana. The study group comprised of patients presenting with salivary gland swellings referred from the outpatient and in-patient departments to the department of Pathology for the purpose of FNAC. Clinical data such as patient's age, gender, site of involvement were noted. Detailed history was elicited from the patients and clinical examination was done to look for the site, size and consistency of the lesion. General examination was done to rule out

swellings elsewhere in the body. Findings of relevant hematological and radiological investigations were noted. In the present study, 65 cases of salivary gland swellings are included on which cytological and histological correlation was done. FNA was performed from different sites of the salivary gland swelling using a 10ml disposable syringe and 23/24 gauge needle without local anaesthesia. Air dried and 95% ethyl alcohol fixed wet smears were stained with Giemsa, Papanicoulou and Hematoxylin and Eosin stains. Formalin fixed surgical specimens of these cases received at the Department of Pathology were processed and embedded in paraffin wax. Tissue sections cut from the paraffin wax blocks were stained with Hematoxylin and Eosin. Special stains were done where required.

RESULTS

In the present study, non-neoplastic lesions accounted for 13.84% (9/65) whereas benign tumors comprised 63.07% (41/65) and malignant tumors comprised 23.07% (15/65). The commonest gland involved was parotid. 80% (52/65) cases occurred in the parotid. Rest of the cases occurred in the submandibular gland (10/65 cases) and minor salivary glands (3/65 cases). Sublingual salivary gland lesions were not encountered in our study. The age group of patients in our study ranged from 8 years to 68 years. Female patients were slightly more affected than males in the ratio of 1.3:1. Non-neoplastic lesions occurred in all age groups, whereas benign neoplasms occurred mostly in

adults between 30 to 40 years. Malignant lesions occurred in older age groups with maximum number of cases between 50 to 60 years. One rare case of Adenoid cystic carcinoma was noted at the age of 11 years. The ratio of female to male for benign neoplasms is 1.3:1 and that for malignant tumors is 1:1.

Chronic sialadenitis was the commonest lesion among the non-neoplastic lesions comprising 77.7% (7/9). There was a single case each of suppurative sialadenitis 11.11% and tuberculous sialadenitis 11.11% (1/9). Neoplastic lesions include benign and malignant tumors and most commonly involved the parotid gland with 46/65 cases (70.76%), followed by submandibular gland 10.76% (7/65) and minor salivary glands 4.6% (3/65) cases. Pleomorphic adenoma (Fig.1 & 2) accounted for maximum number of benign tumors among all sites 75.6% (31/41). There were three cases of schwannomas (Fig.3) We encountered a single case of Warthin’s tumor comprising 2.43% of all benign tumors. There was a single case each of infantile hemangioendothelioma (2.43%), and monomorphic adenoma. In malignant lesions, Mucoepidermoid carcinoma was the most frequent 26.6% (4/15) followed by three cases of acinic cell carcinoma (20%) and adenoid cystic carcinoma (20%) (Fig.4). There were two cases of malignant mixed tumor 13.3% (2/15)) Adenocarcinoma and Polymorphous Low Grade Adenocarcinoma constituted single case each (6.6% each) of all malignancies.

Table 1: Distribution of different lesions according to the site

Site involved	Inflammatory	Benign	Malignant
Parotid	06	35	11
Submandibular	03	06	01
Minor Salivary	00	00	03
Total	09	41	15

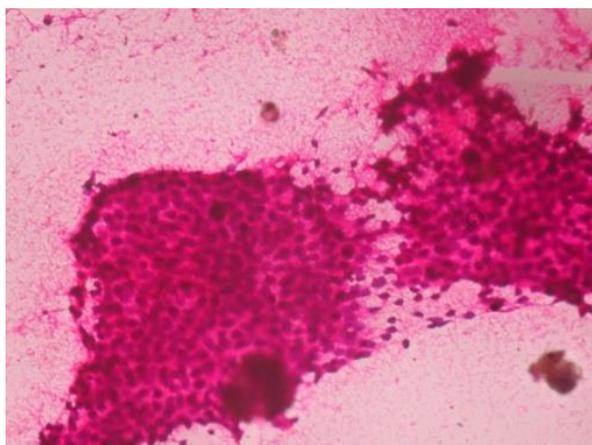


Fig-1: Cytology of Pleomorphic adenoma showing monolayered sheets of duct epithelial cells

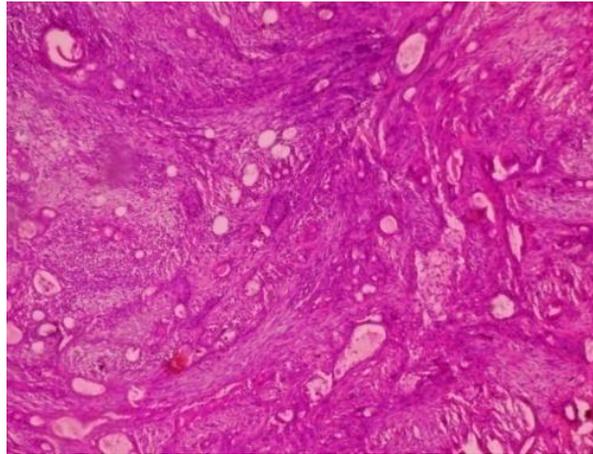


Fig-2: Histopathology showing benign ducts and stroma

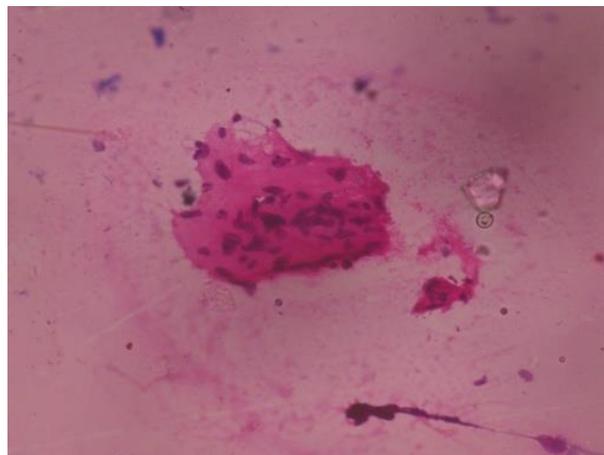


Fig-3: Cytology showing spindle shaped cells in schwannoma

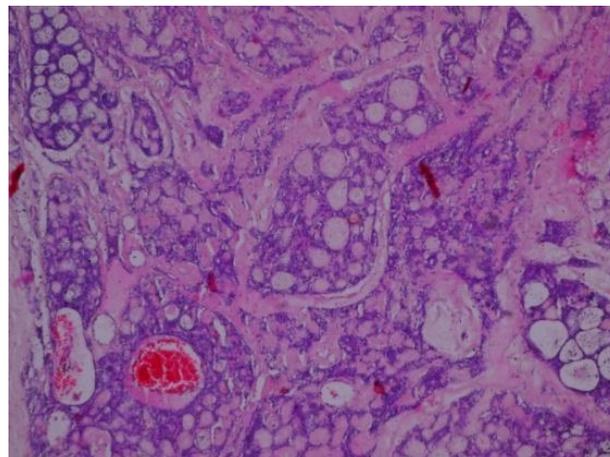


Fig-4: Adenoid cystic carcinoma with cribriform pattern on histopathology

Table 2: Spectrum of neoplastic lesions in Parotid gland (Benign Tumors)

Benign Tumors in Parotid Gland	No. of cases
Pleomorphic Adenoma	27
Schwannoma	02
Basal cell adenoma	02
Warthin's Tumor	01
Monomorphic Adenoma	01
Myoepithelioma	02

Table 3: Spectrum of neoplastic lesions in Parotid gland (Malignant tumors)

Malignant tumors in Parotid Gland	No. of cases
Mucoepidermoid carcinoma	04
Malignant Mixed Tumor	02
Adenoid cystic Carcinoma	02
Adenocarcinoma	01
PLGA	01
Lymphoepithelial Carcinoma	01
Total	11

One out of two cases of myoepithelioma was a spindle cell variant. The single case of lymphoepithelial carcinoma that occurred in the parotid showed metastasis to the cervical lymph nodes. Four cases of pleomorphic adenoma occurred in the submandibular gland and a single case each of Hemangioendothelioma and schwannoma were reported. A single case of adenoidcystic carcinoma affected the submandibular gland. Minor salivary glands showed only malignant lesions consisting of three cases of acinic cell carcinoma. In the present study, both cytology and histopathology were carried out in 65 cases and correlation was done to know the sensitivity, specificity and diagnostic accuracy of FNAC in the preoperative diagnosis of salivary gland lesions. The diagnostic accuracy of FNAC for non-neoplastic lesions, benign tumors and malignant tumors was 100%, 95.12% and 86.6% respectively. The overall diagnostic accuracy was 93.8%. In non-neoplastic lesions, the diagnosis of all cases by FNAC correlated with histopathological findings. Out of 41 cases of benign tumors cytological diagnosis correlated with histopathology in 39 cases. Two cases reported as pleomorphic adenoma on cytology turned out malignant mixed tumor and low grade mucoepidermoid carcinoma respectively on histopathology. In the malignant group, cytological diagnosis of thirteen out of fifteen cases was consistent with histopathological diagnosis. Two cases which were diagnosed as Adenocarcinoma and Malignant mixed tumor on histopathology showed only necrosis on cytology.

DISCUSSION

In the diagnosis of salivary gland lesions, FNAC has a meticulous role as a diagnostic tool due to its minimal risk to the patient and much helpful for the clinicians in the management and planning of surgery. According to some studies, the rate of unsatisfactory samples on FNAC varied from 3 to 12% [4-6]. In the present study it was 3.07%. Nguansangiam *et al* observed the age range from 6 to 100 years with a mean age of 53 years and female predominance [15]. Their study correlated with the study done by Choudhury *et al* [16]. In the present study the age group ranged from 8 to 65 years with a mean age of 40 years and a slight female predominance. The frequency of non-neoplastic lesions in the study by Nguansangiam *et al* ranged from 20% to 72.9%. Similar observations were made in the studies by R. S. Cajulis *et al* and D. K. Das *et al*, [17,

18] whereas in our study the frequency of non-neoplastic lesions are much less accounting only for 13.8%. In the present study, the most common age group for non-neoplastic lesions is 20 to 40 years and the female to male ratio is 1.3:1. The most common non neoplastic lesion is Chronic Sialadenitis which involved the parotid mostly. In the study of Atula *et al* also chronic sialadenitis was the commonest lesion which however involved the submandibular gland more frequently [19]. In the present study, benign neoplasms accounted for 63%. In other studies also, similar results were obtained ranging from 49 to 83.2% [15, 16]. We observed pleomorphic adenoma as the predominant benign neoplasm similar to previously reported studies [15, 17, 18]. Some studies reported malignant tumor frequency in the range of 15 to 32% [17]. This is similar to our study which showed a frequency of 23.07%. In the study of Nguansangiam *et al* lower rates of malignant lesions were found [15]. The diagnostic yield of FNAC according to some studies showed sensitivity upto 99% and specificity upto 85% [20]. In our study, sensitivity of 96.9% and specificity of 96.8% has been observed.

CONCLUSION

The high accuracy, sensitivity and specificity of FNAC is very much helpful as a preoperative procedure in the diagnosis of salivary gland lesions. FNAC is for rapid and early diagnosis of any salivary gland lesions. It is a cost effective diagnostic tool suitable for developing countries.

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