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CYTOLOGICAL SPECTRUM OF SALIVARY GLAND TUMOURS AT MEDICAL COLLEGE IN SOUTH INDIA- AN OBSERVATIONAL STUDY

Pathology

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ABSTRACT

Background: Even if clinical and radiological findings aid in narrowing the differential diagnosis, the gold standard is tissue diagnosis. Fine needle aspiration cytology (FNAC) is test of choice in achieving diagnosis.

Materials and Methods: This study is from 2014-2015 in Department of Pathology where 50 salivary gland lesions (SGL) were aspirated. The aim of the present study was to classify SGL into broad groups, and to differentiate between benign and malignant neoplasms of salivary glands and typify them.

Results: The 50 cytological smears were categorized into two groups: adequate aspirations (94%) and inadequate aspirations (6%). The adequate aspirations were subdivided as neoplastic (84%) and nonneoplastic (10%). In our study, parotid swellings predominated with 84% followed by submandibular 12% and minor salivary glands 2%. Off neoplastic swellings, 69% were benign and 31% were malignant. Benign included pleomorphic adenoma (93%) and 2 are oncocytoma (7%). Malignant included mucoepidermoid carcinoma (76%), acinic cell carcinoma (15%) and a single low-grade salivary gland tumour (9%). The nonneoplastic lesions included 60% cases of chronic sialadenitis, 40% cases were reported as mucocele.

Conclusion: FNAC is a simple procedure which directs the surgeon to avoid unnecessary surgery in nonneoplastic scenarios, aids in identification of malignancy and assisting the surgeon in determining type and range of surgery.

KEYWORDS

INTRODUCTION

Fine needle aspiration cytology (FNAC) is the preliminary investigation done before any surgical intervention for diagnosis of SGLs.

Salivary gland neoplasms account for 2%–6.5% of all the head and neck neoplasms.[1] Widespread application of FNAC in the diagnosis of SGLs has led to an increase in the incidence of SGLs. FNA extracts diagnosis in the majority of cases, thus aids surgeon to aptly plan treatment which ranges from conservative management for nonneoplastic lesions, wide local excision for benign neoplasms, radical surgery for malignant tumours and chemoradiotherapy for metastasis and lymphoproliferative disorders. The cytological evaluation of salivary gland tumours is occasionally restricted by varied range and diverse nature of benign and malignant tumours arising in this area, many of which share overlapping cytological features, thus making the diagnosis difficult at times. The accuracy of cytological diagnosis depends on manifold factors that include aspirator experience, clinical and radiological data about the lesion and utilization of type of stain for FNA of SGLs.

The aim of the present study was to classify SGLs into broad groups, and to differentiate between benign and malignant neoplasms of salivary glands and typify them.

MATERIALS AND METHODS

This was a prospective study over a period of 1 year (2014-2015) comprising 50 patients with SGLs who underwent FNAC in Department of Pathology. The clinical data relating to patients' age, sex and anatomical site were recorded, after appropriate consent.

All the aspirations were performed by cytopathologists. A 22-gauge needle fitted to 10c.c syringe was used for the FNA, aspirates are smeared over glass slide, alcohol fixed and later on stained with haematoxylin and eosin. The special stains such as Ziehl–Neilson (ZN) were used as and when required. The stained FNA smears were examined by two cytopathologists independently for cytomorphological findings, diagnosis and differential diagnosis where needed. $P \leq 0.05$ was considered statistically significant.

RESULTS

In our study, 50 patients underwent FNA of SGLs. The cytological smears were categorized into two groups: adequate aspirations (47, 94%) when smears had sufficient cellularity and were suggestive of definitive diagnosis, and inadequate aspirations (3, 6%) when smears did not show any epithelial cells and comprised blood/necrosis only.

The adequate aspirations were subdivided as neoplastic (84%) and nonneoplastic (10%). The distribution of the various neoplastic lesions as shown in Table 1. Among benign neoplasms, pleomorphic adenoma (27; 93%) was the most frequent followed by oncocytoma (2;7%).

The most common malignant neoplasms were mucoepidermoid carcinoma (10;76%), acinic cell carcinoma (2;15%) and a single low-grade salivary gland tumour (1;9%). Majority of lesions were observed in fourth decade with female: male ratio 1.2:1. A strong positive association was observed between type of neoplasms and age ($P < 0.001$).

TABLE 1: DISTRIBUTION OF NEOPLASTIC LESIONS

TYPE	Number of cases	Percentage
BENIGN	29	69%
PLEOMORPHIC ADENOMA	27	93%
ONCOCYTOMA	2	7%
MALIGNANT	13	31%
MUCOEPIDERMOID CARCINOMA	10	76%
ACINIC CELL CARCINOMA	2	15%
LOW-GRADE SALIVARY GLAND TUMOUR	1	9%

Parotid swellings predominated with 84% followed by submandibular (12%) and minor salivary glands (2%). It was observed that type of neoplasms had a positive correlation with anatomical site ($P < 0.001$).

The distribution of the nonneoplastic lesions is summarized in Table 2. The nonneoplastic lesions included 3 (60%) cases of chronic sialadenitis and 2 (40%) cases were reported as mucocele.

TABLE 2: DISTRIBUTION OF NON-NEOPLASTIC LESIONS

TYPE	Number of cases	Percentage
CHRONIC SIALADENITIS	3	60%
MUCOCELE	2	40%

DISCUSSION

Over the years, the role of FNAC in the diagnosis of SGLs has been improving. Even if clinical and radiological findings aid in narrowing differential diagnosis, the gold standard is tissue diagnosis. FNA cytology is test of choice in achieving tissue diagnosis. The aim of FNAC was to differentiate neoplastic lesions from non-neoplastic and

further sub group them into appropriate diagnosis. FNAC provides information that can aid surgeon to tailor the management of SGLs as per clinical indication. Thereby, FNAC can avoid unnecessary surgery in case of non-neoplastic lesions. In neoplastic lesions, FNAC aids in subgrouping them, thus further assisting in treatment planning. A stepwise approach in FNA of salivary glands starts from clinical examination of lesion, type of aspirate aspirated and microscopic examination of smears.

The cytological analysis in the present study revealed 94% as adequate for evaluation and 6% as inadequate aspirations, which falls within range of 3-12% of non-diagnostic rate reported in literature.[2,3] A study conducted by Das et al.[4] on 712 patients of salivary gland aspirates also showed 96% aspirates as adequate for evaluation. A Study by Sandhu et al.,[5] who evaluated 170 salivary gland aspirates and found 11.7% aspirates as inadequate for evaluation, slightly higher than that are observed in our study. A larger study by Nguansangiam et al.,[6] who evaluated 290 salivary gland aspirates and found 5.2% aspirates as inadequate for evaluation, similar to results of our study. FNAC performed by experienced cytopathologists with the help of radiological guidance, the rate of sampling errors could be minimised.[7] In our study, 47 aspirates were regarded as adequate for evaluation, out of which 42 (89.3%) were reported as neoplastic, 5 (10.6%) as nonneoplastic. Our rate of non-neoplastic as less than the incidence of non-neoplastic lesion described in literature ranging between 20-61.6%.[8,9] The primary reason that could be attributed this discrepancy could be relatively small sample. The other reason could be the tertiary nature of our hospital, where advanced cases are presented in large numbers. In developing countries, patients delay their visit to physicians, until the clinical symptoms are intolerable and cosmetically not pleasing.

Neoplastic lesion (89.3%) were the most common condition for which salivary gland were needled, of which 69% were benign and 31% were malignant. The ratio of benign tumours to the malignant tumor is 2.2:1. Similar results were shown by Vaidhya et al.,[10] who evaluated 58 salivary gland aspirates and found 76.9% were benign and 23.1% were malignant cases, similar to results of our study.

In our study, most of the lesions are in the age group of 41-60 years and predominantly females. The similar findings were observed by Ritu et al.,[11] who observed that median age of presentation of SGLs is 35 years. Parotid gland was the most common site for all the salivary gland lesion followed by submandibular gland and sublingual gland. The similar findings were observed by Perkins et al.,[12], Verma et al.,[13] & Sengupta et al.[14]

Among the non-neoplastic lesions, chronic sialadenitis was the most common similar to results reported by Vaidhya et al[10] and Das et al.[4] Among the benign neoplasm, pleomorphic adenoma (93%) was the most common lesion with increased incidence of occurrence in parotid gland in the present study. Similar observation was noted by Masanja et al[15] & Sunida et al.[16]

Among the malignant SGLs, Mucoepidermoid carcinoma was reported in 77% cases. It was the most common of all malignant tumour in our study. Similar observation was made by Flavia et al[17] and Muhammed Isakara et al.[18] Two cases (15%) of acinic cell carcinoma and one case of low-grade salivary gland carcinoma were reported in the study. Their incidence is comparable to that of other studies.[19]

FNAC provide crucial pre-operative information which aids physicians in scheduling further management of patient either to treat conservatively or to subject the patient for surgery. It is essential to note that FNAC eliminates unnecessary surgery in about one third of cases.[20]

CONCLUSION

In this study, data is evaluated on salivary glands cytology in terms of frequency, site of origin, patient demographics with knowledge of mimickers and hence clearly differentiated. FNAC is a simple and easy diagnostic tool, which gives confirmatory information for differentiating the neoplastic and non-neoplastic lesions of salivary glands thereby reducing the surgical morbidity in non-neoplastic lesions.

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