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Original Article

Fine Needle Aspiration Cytology of Salivary Gland Lesions with Application of Milan System of Reporting.

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Abstract

Introduction: FNAC of salivary is simple, easy, cost-effective investigation that can be used to differentiate benign and malignant lesions. Milan system was introduced to improve the communication between cytopathologists and physicians.

Objectives: To diagnose the salivary gland swelling using fine needle aspirations by Milan system of reporting and correlate with histopathology.

Materials and methods: Total number of 150 cases of salivary gland lesions were studied from September 2020 to August 2021 in SNMC and HSK hospital. Smears were then stained with H&E, Giemsa and PAP stains.

Results: A total 150 patients that underwent FNAC, reported using Milan system of reporting and followed up with histopathological correlation. Results revealed that FNAC was effective in differentiating benign and malignant conditions by using Milan system of reporting.

Conclusion: FNAC is a safe, reliable and yet economically effective technique in diagnosing salivary gland lesions. Milan system of reporting is essential to improve the communication between cytopathologists and physicians and gives universal approach in diagnosis and management of salivary gland lesions. So FNAC with Milan system can be used as effective pre-operative investigation in patients with salivary gland lesions.

Keywords: FNAC, Milan system, Cytopathologist.

Introduction

Fine needle aspiration cytology of salivary glands is easy, cost-effective, minimally invasive and well established diagnostic procedure.[1] It can be effectively useful in distinguishing non- neoplastic and neoplastic entities.[1,2] Salivary gland FNAC poses diagnostic challenges due to diversity in salivary gland neoplasms, heterogeneity of tumors and lastly due to morphological overlap.[2] Though there are challenges in diagnosing salivary gland FNAC, the diagnostic utility of salivary gland FNAC is well documented and studied.[2] Neoplasms of salivary glands account for 2 -6.5% of all head and neck tumors out of which 80% originate only from parotid gland.[3-8]

The American Society of Cytopathology (ASC) and the International Academy of Cytology worked and developed a uniform classification system for reporting salivary gland cytology[3]. This system has been developed by international association of health care professional and is known

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as Milan System for Reporting Salivary Gland Cytopathology (MSRSGC). In 2015, an international group of pathologists initiated the development of an evidence-based tiered classification system for reporting salivary gland FNA specimens designated the "Milan System for Reporting Salivary Gland Cytopathology" (MSRSGC).[4] The main goal of the MSRSGC is to improve communication between cytopathologists and treating clinicians, while also facilitating cytologic – histologic correlation, sharing of data from different laboratories for quality control, and research.[4-9]

Material and Methods

In the current study total 150 cases of salivary gland lesions were studied from the period of September 2020 to September 2021 at SNMC and HSK hospital. Patients of all age group presenting with salivary gland swelling were included. Oral informed consent was obtained from each patient and FNAC was performed using aseptic precautions with 22-23 gauge needle. Smears made were stained with May-Grunwald-Giemsa stain, Hematoxylin & Eosin stain and PAP stain. All smears were reported using Milan system of reporting of salivary gland lesions. All the patients were followed up with histopathology for correlation.

Results

A prospective study of salivary gland lesion for a period of one year was performed and total of 150 cases were evaluated, for whom histopathological correlation was available. The age of the patients varied from 20 to 65 years. Male to female sex ratio was 1.3:1. The most common salivary gland involved in the current study was parotid gland followed by submandibular gland and minor salivary glands. There were no post-FNA complications observed in any of the cases.

Table 1. Cytological diagnosis offered

Milan System Category	No of cases	Percentage
Non - diagnostic	–	–
Non - neoplastic	54	36%
Atypia of undetermined significance	–	–
Neoplasm	69	46%
Benign	6	4%
Uncertain Malignant Potential		
Suspicious for malignancy	21	14%
Malignant	–	–
Total number of cases	150	100%

Non-diagnostic aspirations were found in 0 cases. Non-neoplastic lesions accounted for 54 cases (36%). Atypia of undetermined significance were found in 0 cases. Out of 75 cases reported as neoplastic lesions, benign lesions were 69 cases (46%) and lesions of uncertain malignant potential were 6 (04%). 21 cases (14%) were reported as suspicious for malignancy.

Male and female ratio in the current was 1.3:1, listed in Table 2. All 150 cases were followed up with histopathological correlation. There was discordance noted in 17 cases between cytology and histopathology diagnosis. Out of 21 cases reported as suspicious of malignancy only 4 cases reposted as mucoepidermoid carcinoma. The histopathological diagnosis given were listed in Table 3. The distribution of lesions according to the glands are listed in Table 4.

Table 2. Male to female sex ratio

Gender	Frequency	Percentage
Male	87	58%
Female	63	42%
Total number of cases	150	100%

Table 3. Histopathological diagnosis offered

Histopathological Diagnosis	No of cases
Chronic non-specific sialadenitis	54
Pleomorphic adenoma	75
Oncocytoma	13
Basal cell adenoma	4
Mucoepidermoid carcinoma	4
Total number of cases	150

Table 4. Distribution of lesions according to salivary glands

Site of the lesion	Frequency	Percentage
Parotid gland	106	71%
Submandibular gland	42	28%
Minor salivary glands	2	1%
Total number of cases	150	100%

Discussion

Salivary gland FNAC is a safe, minimally invasive, cost efficient and effective diagnostic technique.[1-7] It has an edge over frozen sections because it proves the nature of the lesion before surgery and thus acts

as a useful triage tool, also it prevents patients with non-neoplastic lesions from undergoing surgery.[8] Despite its wide acceptance as a diagnostic tool with low rates of complication and patient morbidity, interpretation of salivary gland FNA specimens remains one of the most challenging areas within cytopathology.[9] Factors contributing to this difficulty include overlapping morphologic features between benign and malignant entities, the vast heterogeneity of tumour nodules, lesion cell resemblance to normal salivary gland elements, metaplastic or cystic changes mimicking neoplasms, the need to evaluate capsular invasion which cannot be done on FNA and the presence of focal atypia all of which can preclude precise categorization of salivary gland lesions.[10]

Diagnostic accuracy on FNA requires careful integration of clinical features, morphology, radiologic features, and, ideally, discussion with clinical colleagues. A unified classification system for reporting such as the MSRSGC has several advantages. First, it has defined diagnostic categories with a predetermined risk of neoplasm and malignancy and recommendations for management. Second, it allows cross communication between institutions and even around the world. Third, it facilitates review and analysis of published literature using the same classification scheme.[4-15]

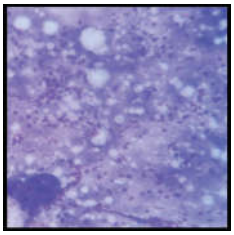

Fig. 1: FNAC, Giemsa, 10X, Smears

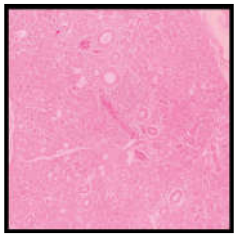

Fig. 2: HPR, H&E, 10X, Sections shows show inflammatory cells pre-dominantly lymphoid aggregates with focal neutrophils. area offibrosis.

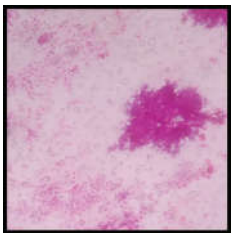

Fig. 3: FNAC, PAP, 10X, Pleomorphic

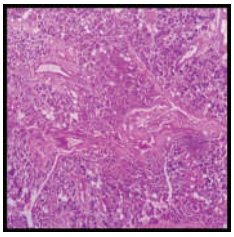

Fig. 4: HPR, H&E, 40X, Pleomorphic adenoma showing cohesivecluster adenoma showing epithelial & of epithelial and myoepithelial cells. myoepithelial cells.

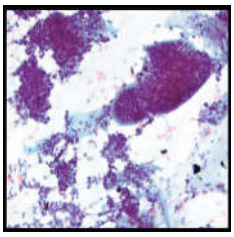

Fig. 5: FNAC, PAP, 10X, Basal cell

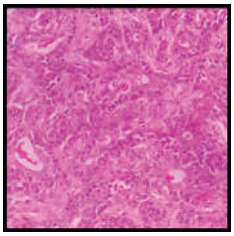

Fig. 6: HPR, H&E, 40X, Basal cell adenoma showing basaloid cells in adenoma showing basaloid cells in clusters. clusters with few ductal cells.

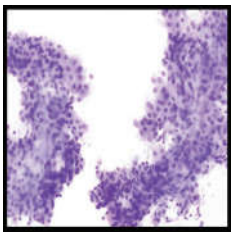

Fig. 7: FNAC, Giemsa, 40X,Suspicious of

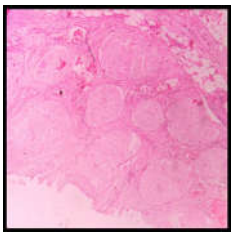

Fig. 8: HPR, H&E, 40X, Sections showing malignancy showing pleomorphic cells pools of extra cellular mucin in in sheets. mucoepidermoid carcinoma.

In our study 0 cases were found to be non-diagnostic, 36% were non-neoplastic, 0 cases were categorised in atypia of undetermined significance. 46% were in benign neoplasm category, 4% in neoplasm of undermined malignant potential and 14% were in suspicious of malignant category, 0 cases categorised as malignant.

In our current study the most common lesion is pleomorphic adenoma and most common salivary gland involved is parotid gland similar to Punjani M et al, Song JS et al, Tommola E et al, Mullen D et al, Mukundapai M et al. Non-diagnostic aspirations in current study were 0% while in Punjani et al, Song JS et al, Tommola et al, Mullen D et al, Mukundapai et al are 4.6%, 15.1%, 41.9%, 15.6% and 1.58% respectively. Aspirations which were suspicious for malignancy in our study is 14% while in Punjani et al, Song JS et al, Tommola et al, Mullen et al, Mukundapai et al were 1.3%, 24%, 83.3%,1.6% and 0.6%.

Conclusion

Fine needle aspiration cytology is a safe, reliable and yet economically effective technique in diagnosing salivary gland lesions. It has a high degree of diagnostic yield and sensitivity though the rate of characterization of specific type of tumor is lower, especially when dealing with cystic and some malignant lesions like adenoid cystic carcinoma due to variable cytomorphology. However, histopathological examination is necessary for confirmation of the FNAC diagnosis. Milan system of reporting is essential to improve the communication between cytopathologists and physicians. Also, Milan system of reporting gives a universal approach in diagnosis and management of salivary gland lesions. So FNAC with Milan system of reporting can be used as effective pre-operative investigation in patients with salivary gland lesions. But FNAC should be complemented with radiological and clinical correlation.

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