

Cytopathological Spectrum of Salivary Gland Lesion Based on Milan System in a Tertiary Care Hospital

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Abstract:

Background: Fine needle aspiration cytology is used worldwide for diagnosis and management of salivary gland tumors. Milan system of reporting salivary gland cytopathology (MSRSGC) was used for a uniform reporting pattern to help clinicians plan further diagnosis and management. A two year retrospective study was conducted on 115 cases of various salivary gland swelling and categorized according to the Milan classification in the Department of Pathology, Gauhati Medical College, and Hospital between July 2020 to June 2022.

Results: In the present study, salivary gland lesions were seen mostly in 5th to 6th decade of life with a male predominance in this study in comparison to previous studies and the parotid gland was most frequently involved site. In our study neoplastic lesions were the most common

Conclusion: Fine needle aspiration cytology is a fast, cost-effective, and safe diagnostic procedure useful in the initial preoperative diagnosis of salivary gland tumours to plan for appropriate treatment. However, it should be correlated with histopathological confirmation.

Keywords: FNAC, Mucoepidermoid Carcinoma, Pleomorphic Adenoma, Retrospective Study, Salivary Gland.

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Introduction

Salivary gland lesions represent 3%-6% of all tumors of the head and neck region. Proper management of these tumors requires an accurate diagnosis by the pathologist, radiologist and clinicians. [1] Fine needle aspiration cytology of salivary gland is used worldwide for the diagnosis and management of salivary gland tumors. It provides a minimally invasive, safe, cost-effective and accurate technique that is extremely useful in identifying a substantial subset of salivary gland nodules as benign and thus reduces unnecessary invasive surgical procedure in patients with benign diseases. [2]

Factors such as uncertainty of site, tissue actually aspirated, aspiration of minimal material, lack of architectural pattern in smear have a large impact on specific cytological diagnosis. [3]

Furthermore, considerable overlap in morphological patterns and cytomorphological heterogeneity within the same tumor can bring about difficulty in differentiating and exact subgrouping of tumor even in aspirates with abundant cell yield. [4] For a uniform reporting pattern, American Society of Cytopathology (ASC) and the International Academy of Cytology (IAC), gathered in September 2015 at the European Congress of Cytology, held in Milan,

Italy, to propose Milan System, with the aim to produce a practical classification system that is user-friendly and internationally accepted. [1].

Aims and Objectives

1. To analyze the cytological spectrum of salivary gland tumours.
2. To classify the tumors according to Milan System.

Materials and Methods

A 2 year retrospective study was carried in a tertiary care hospital of Assam (July 2020 to June 2022). All the relevant clinical details, local examination findings and cytological reports were noted from the records wherever available. A total of 115 cases of various salivary gland swellings were studied that underwent FNAC during this period and categorized according to the Milan classification.

Category 1: Non- diagnostic (ND)

Category 2: Non- neoplastic (NN)

Category 3: Atypia of undetermined significance (AUS)

Category 4a: Neoplasm: benign (NB)

Category 4b: Neoplasm: salivary gland neoplasm of uncertain malignant potential (SUMP);

Category 5: Suspicious of malignancy (SM)

Category 6: Malignant (M)

FNAC was performed using a 22-23G gauge needle with 20 mlsyringe. The air dried and ethanol fixed smears were stained using May Grunwald Giemsa stain and Papanicolaou's stain.

Inclusion Criteria

- All the satisfactory FNAC smears of salivary gland tumours during the study period.
- Patients of all age groups and both genders were included in this study.

Exclusion Criteria: Inadequate samples with cellular material for cytological diagnosis were excluded from this study.

Results

The FNAC distribution of 115 cases according to the age, sex and site of involvement is shown in the tables. Males were slightly more affected than females. Table 1. Males=72(62.6%) and females=43 (37.39%). Patients age ranged from 4 to 81 years and peak age of incidence was in the 5th and 6th decade of life. Table 2. Parotid gland was the most frequently involved 72(62.61%) followed by submandibular gland 25(21.74%) and minor salivary gland 18(15.65%). Table 3.

Table 1: Distribution of cases according to sex

Sex	No of cases
Male	72 (62.6%)
Female	43 (37.39%)

Table 2: Distribution of cases according to age

Age in years	No of cases
<10	4 (3.48%)
11-20	7 (6.09%)
21-30	17(14.78%)
31-40	18(15.65%)
41-50	20(17.39%)
51-60	21(18.26%)
61-70	21(18.26%)
71-80	5(4.35%)
81-90	2(1.74%)

Table 3: Distribution of cases according to the salivary gland involved

Gland involved	No of cases
1.Parotid	72(62.61%)
2.Submandibular	25(21.74%)
3.Minor salivary gland	18(15.65%)

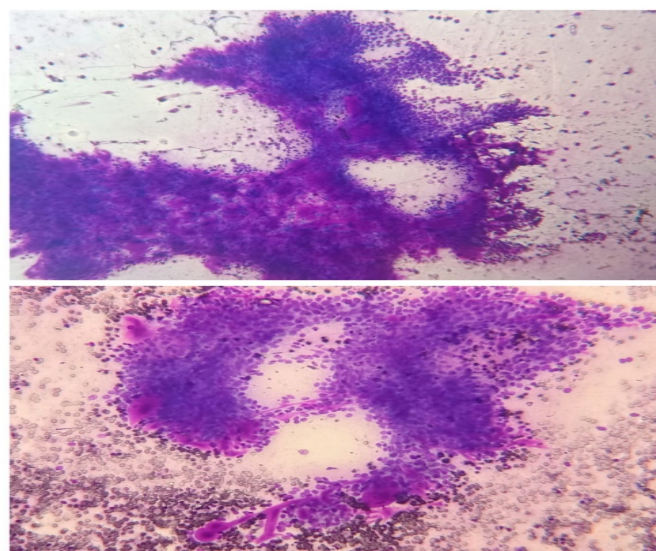


Figure 1: Low power view showing Pleomorphic Adenoma (100x)

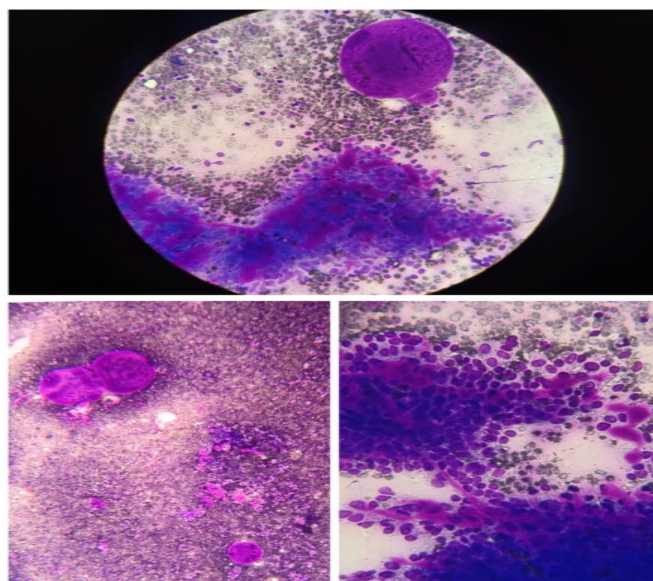


Fig 2: Low power view showing Adenoid Cystic carcinoma (100x)

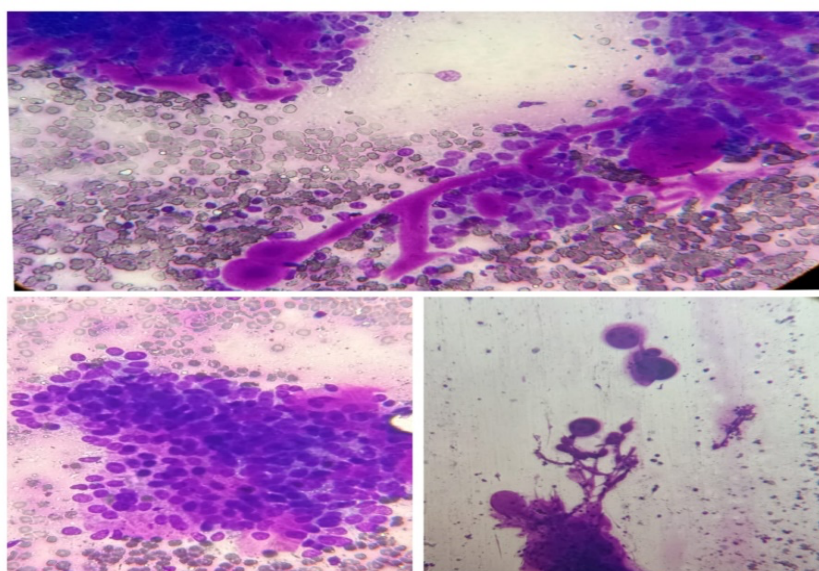


Figure 3: High power view showing Adenoid Cystic carcinoma (400x)

Parotid gland was the most frequently involved 62.61% followed by submandibular gland 21.7% and minor salivary gland 15.65%.FNAC distribution of cases according to MSRSGC is shown in table 4. NB category was the largest category 40.8% followed by NN category (33%), M, ND, SUMP & SM

category 20.8%, 2.6%,1.7% and 0.86% respectively. No cases were found in the AUS category. Of the 115 FNAC cases observed 91 cases were benign and 24 cases were malignant. Benign lesions were more than the malignant lesions.

Table 4: Diagnostic category based on Milan system

Diagnostic category	No of cases (115)
1.Non diagnostic (ND)	3(2.6%)
2.Non neoplastic (NN)	38(33%)
3.Atypia of undetermined significance (AUS)	0
4.Neoplasm	
a. Benign (NB)	47(40.8%)
b. Neoplasms of uncertain malignant potential(SUMP)	2(1.7%)
5.Suspicious of malignancy(SM)	1(0.86%)
6.Malignant (M)	24(20.8%)

In the NN category out of 38 cases, we found 24 cases of sialadenitis (Acute sialadenitis-6, chronic sialadenitis -18), 4 cases of benign cystic lesion and 10 cases of mucocele. In the NB category out of 47 cases- 34 cases of pleomorphic adenoma, 3 cases of Warthin's tumor, 2 cases of Basal cell adenoma, 6 cases of myoepithelioma & 2 cases of schwannoma. In the malignant category out of 24 cases -10 cases of mucoepidermoid carcinoma, 7 cases of adenoid cystic carcinoma, 4 cases of carcinoma ex pleomorphic adenoma & 3 cases of acinic cell carcinoma.

Discussion

Introduction of the Milan system in classifying the salivary gland lesions and their risk stratification helps us in providing preoperative diagnosis. It helps us in giving definite cytological diagnosis wherever specific cytomorphological features are seen. [10]

In the present study, salivary gland lesions were seen in the age range of 4-81 year and majority occurred in 5th to 6th decade of life. In our study salivary gland tumors were seen in elderly age group as compared to other studies. There is a male predominance in this study in comparison to previous studies the parotid gland was most frequently involved site followed by the submandibular gland and minor salivary gland which is similar to other studies [1]

In our study, benign tumors were the most common finding which was in concordance with other studies Sialadenitis was the most common lesion similar to studies [1]

In our study neoplastic lesions was the most common lesion as studies conducted by various authors but studies by Rohilla et al [6] and Das et al [7] indicates more non-neoplastic lesions.

In the present study, 3 cases (2.6%) were Non diagnostic -Cat 1, due to the hypocellular aspirate with presence of blood and few inflammatory cells. The other studies that reported salivary gland aspirates as Non-diagnostic are Karuna et al [1] & Rohilla et al [6].

In the NN category, sialadenitis was the most common nonneoplastic lesion which is concordant with other studies by Mukundapai et al [10] and Das et al [7].

Category 4a (Neoplastic-Benign) had 47 cases. Pleomorphic adenoma comprised the majority cases which was similar to studies done by Kala C et al [2]. Category 4b (Neoplasm of uncertain malignant potential) included cases where cytological features are suggestive of a neoplastic lesion however features cannot distinguish between a benign and malignant neoplasm. Category 5 (Suspicious of malignancy). In our study we had a single case where smear showed few markedly atypical cells but was limited by the scanty cellularity in the smear.

Category 6 (Malignant). In our study we found most of the malignant cases to be mucoepidermoid carcinoma followed by adenoid cystic carcinoma, this was similar to studies done by Kala. C et al [2] In our study we did not find any cases that fall in Cat 3-Atypia of undetermined significance.

Conclusion: Fine needle aspiration cytology is a fast, cost effective, and safe diagnostic procedure useful in the initial preoperative diagnosis of salivary gland tumours to plan for appropriate treatment. However, it should be correlated with histopathological confirmation. MSRSGC is an updated six category scheme to classify salivary gland lesions; despite having heterogeneity and morphological overlap between different salivary gland lesions, it will help the cytopathologists and treating clinician due to the benefit of risk stratification and providing ROM, this system proposed a tiered scheme which places salivary gland. FNAC into well-defined categories that limit the possibilities of false negative and false positive cases.

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