Original Research Article

MILAN SYSTEM OF REPORTING OF SALIVARY GLAND CYTOPATHOLOGY

Arshiya Firdous mohammad[1], Vijayasree Mandava[2], Vasundhara .M[3], Shaik Yusuf Ali[4], Sravani Tadavarthi[5], Sushma Uppala[6]

[1]*Assistant professor Department of Pathology Siddartha Medical college, Vijayawada, Andhra Pradesh, India.*
[2]*Professor &HOD Department of Pathology Siddartha Medical college, Vijayawada, Andhra Pradesh, India.*
[3]*Professor, Department of Pathology Siddartha Medical college, Vijayawada, Andhra Pradesh, India.*
[4]*Post graduate, Siddartha Medical college, Vijayawada, Andhra Pradesh, India.*
[5]*Post graduate, Siddartha Medical college, Vijayawada, Andhra Pradesh, India.*
[6]*Post graduate, Siddartha Medical college, Vijayawada, Andhra Pradesh, India.*

A B S T R A C T

Background: Fine needle aspiration cytology (FNAC) is a simple, safe and cost effective procedure for evaluation of salivary gland tumours. Milan system provides standard terminology and provides information about risk of malignancy.

Material and Methods: Retrospective study between 2022 and 2023. FNAC was performed using 22/23 gauze needle fixed in isopropyl alcohol and was haematoxylin and eosin stained.

Results: According to Milan classification, out of 58 cases 3 cases were Non diagnostic (category1), 19 cases were Non neoplastic (category 2) ,1 case was Atypia (category 3), 30 cases were benign neoplasm (category 4A) and 1 case with salivary gland neoplasm of uncertain malignant potential (category 4B), 1 case with suspicion of malignancy (category 5) and 3 cases were malignant (category 6).

Conclusion: With the use of Milan system of classification of salivary gland cytopathology, it is helpful to stratify, providing clue to clinician and assessing risk of malignancy.

Keywords: Milan System, Salivary Gland, FNAC, Malignancy

INTRODUCTION

Salivary gland neoplasms constitute 6.5% of head and neck tumors. Fine needle aspiration is a simple, useful and cost-effective8 procedure to evaluate between non neoplastic and neoplastic lesions and benign and malignant lesions. Image guided FNAC is useful for localization of swelling. FNAC has specificity and sensitivity of 88 % % to 92 and 94%1,8. Salivary gland tumors have heterogenicity. FNAC has diagnostic difficulty when there is presence of basaloid cells, oncocytic change and cystic component. Clinician also face difficulty in interpretation of report and for further management. Milan system six tier classification provides standard terminology and also gives information about risk of malignancy and guide for clinical management. Milan system have 6 diagnostic categories.

Category	
1	NON-DIAGNOSTIC
2	NON-NEOPLASTIC
3	ATYPIA OF UNDETERMINED SIGNIFICANCE
4	NEOPLASM 4A. NEOPLASM: BENIGN 4B. NEOPLASM: SALIVARY GLAND NEOPLASM OF UNCERTAIN MALIGNANT POTENTIAL
5	SUSPICIOUS OF MALIGNANCY
6	MALIGNANT

MATERIAL AND METHODS

A Retrospective study done one year between 2022 to 2023. Fine needle aspiration was performed using 5 cc syringe with 22/23 gauze needle under aseptic conditions. Smears were fixed in isopropyl alcohol and stained with hematoxylin and eosin. 11 cases were available for histopathological follow up. Formalin fixed specimens which are resected or biopsied embedded in paraffin and stained with hematoxylin and eosin.

RESULTS

Out of 58 cases, 29 cases were male and 28 cases were females and 1child. Males are slightly affected more than females.
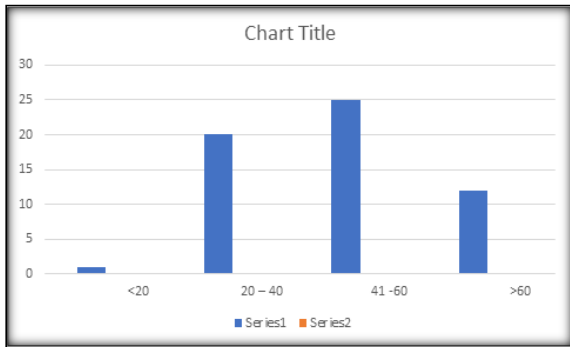

Figure 1:

Most cases were seen between 41 to 60 years of age group, younger age was 4 years and older age was 81 years.
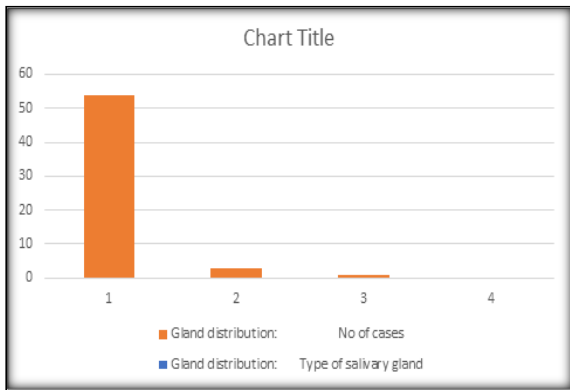

Figure 2:

In Majority of cases parotid gland involved, later submandibular gland, followed by minor salivary gland.
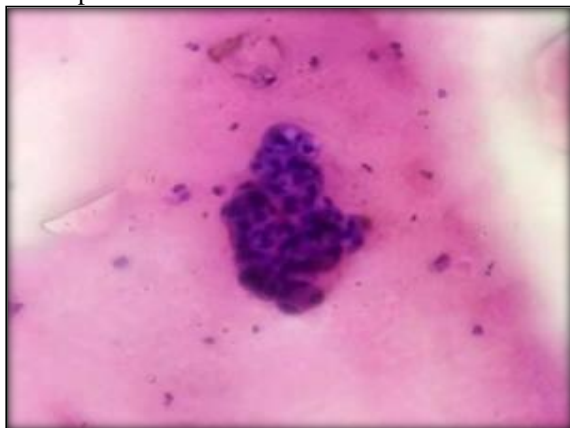
Mucoepidermoid carcinoma

Figure 3: Smears show cohesive clusters of epithelial cells in the background of mucin
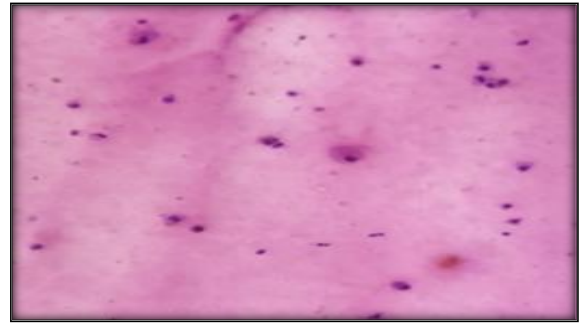
Mucoepidermoid carcinoma

Figure 3: Smear shows low cellularity with mucin secreting cells and inflammatory cells against dirty background

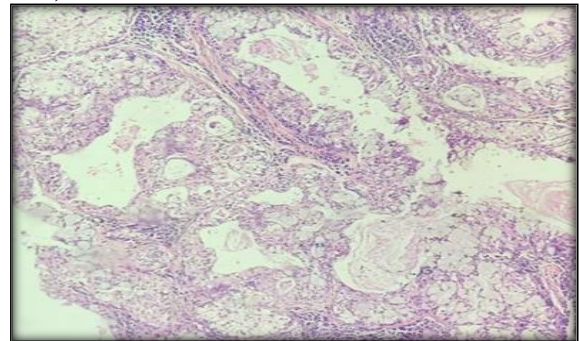**Low grade mucoepidermoid carcinoma (HPE, 10X)**

Figure 4: Cystic spaces lined by mucinous epithelial cells
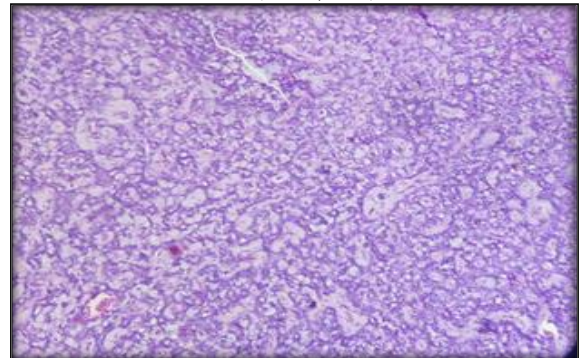
Canalicular adenoma(HPE,10X)

Figure 5: Sections showing bilayered strands of columnar epithelial cells separated by loose and vascularised myxoid stroma

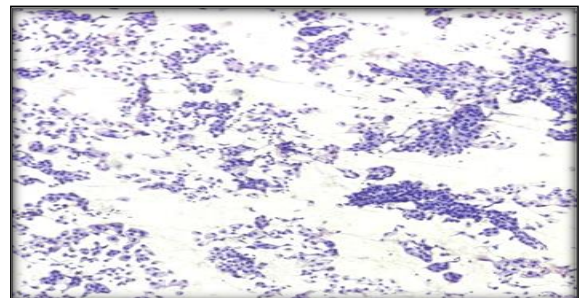**Acinic cell carcinoma**

Figure 6: Cellular smear studied shows cells arranged in clusters with abundant vacuolated cytoplasm, with round and bland nuclei with fibrovascular stroma
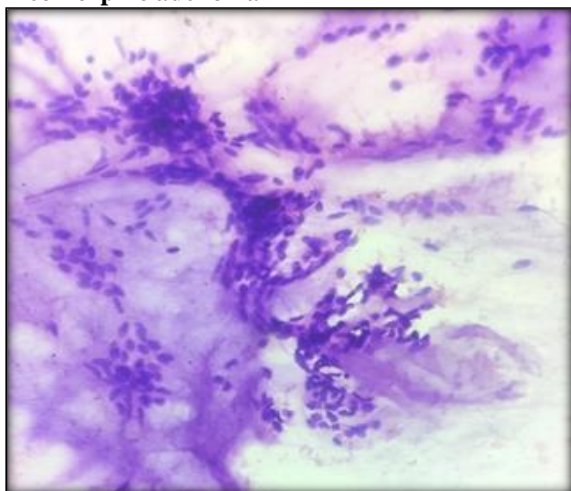
Pleomorphic adenoma

Figure 7: smear shows cohesive epithelial cells in fibrillar fibromyxoid stroma
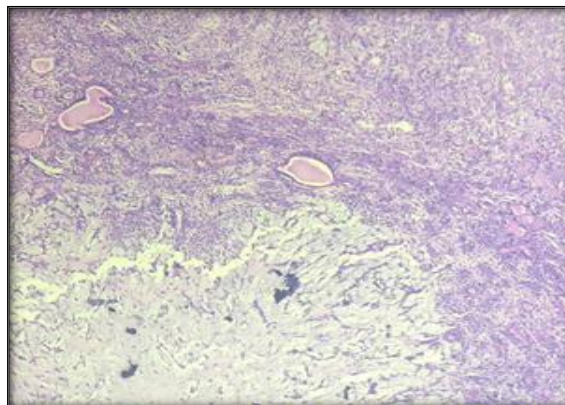
Plemorphic Adenoma

Figure 8: Section studied shows epithelial component arranged in sheets and glandular pattern with chondromyxoid stroma

FNAC and histopathological correlation Most of the cases were pleomorphic adenoma, on case cytology reported as pleomorphic adenoma later in histopathology reported as canalicular adenoma. one case reported as mucoepidermoid carcinoma in cytology it was correlated in Histopathology as low grade muco-epidermoid carcinoma, one case given as suspicious of malignancy later reported as adenoid cystic carcinoma in histopathology. One case reported as sialadenitis in cytology, in histopathology it was reported as cellular pleomorphic adenoma.

Table 1: Clinical grading

MALE	FEMALE	CHILD
29	28	1

Table 2: Age distribution

Age in years	No of cases	Percentage
<20	1	1.7%
20 – 40	20	34%
41 -60	25	43%
>60	12	20.6%

Table 3: Gland distribution

Type of salivary gland	No of cases	percentage
Parotid gland	52	89%
Submandibular gland	5	8.6%
Minor salivary gland	1	1.7%

Table 4: Category distribution

Category		No of cases	percentage	Number of cases for HPE follow up	No. of cases Malignant in hpe	ROM
1	Non diagnostic	3	5.1%			
2	Non neoplastic	19	32.7%	1		0
3	Atypia	1	1.7%			
4	Neoplasm 4A – benign 4b- Salivary gland neoplasm of uncertain malignant potential	30 1	51.7% 1.7%	8		0
5	Suspicious of malignancy	1	1.7%	1	1	100%
6	Malignancy	3	5.1%	1	1	100%

DISCUSSION

FNAC is a useful technique for initial diagnosis of salivary gland lesions and for further clinical management. Out of 58 cases, only 11 cases are available for histopathological correlation.

In present study, out of 58 cases, 29 are males (50%) ,28 were females (48%) and one case was child,[3,4] correlated with other studies garim singh et al and Datta et al.[7] Most of the tumors seen in 41 – 60 years age group with 25 cases (43%).

Most of the lesions are located in parotid gland about 93%. 5.1 % cases in submandibular gland and only 1.9% in minor salivary gland correlated with garim singh et al,[4] and kumar .M et al.[9]

In present study out of 58 cases, non-diagnostic are 3 cases (5.1%) i.e., category 1 – aspiration showed less cellularity correlated with chayanika et al,[3]

Non neoplastic lesions – Category 2 -33% of cases, most cases were chronic sialadenitis followed by sialadenosis. One case in cytology reported as sialadenitis, on histopathological examination reported as cellular pleomorphic adenoma. Result correlated with authors garim singh et al4 and Maleki Z.[5]

Atypia of undetermined significance category- category 3- Only one case was reported (1.7%). Result correlated with Garima singh et al.[4]

In category 4, 30 cases were benign (51.7%) 8 cases available for histological follow up all are reported as pleomorphic adenoma. Only 1 case categorized as Salivary gland lesion of undetermined malignant potential histological follow up not available. Result correlated with other studies chayanika kala et al,[3] and Higuchi et al,[10] et al most of the benign neoplasms were pleomorphic adenoma.

In category 5, (1.7%)1 case is categorized as suspicious of malignancy, correlated with Karthik Viswanathan et al,[1] later in histopathological follow up reported Adenoid cystic carcinoma and not correlated with sandhu .V et al6 due to less study material. Risk of 100% malignancy correlated with datta et al.[7]

In category 6, (5.1%) 3 cases were reported as malignancy.one case is available for histological follow up and reported as mucoepidermoid carcinoma.it was correlated with Higuchi et al,[10] risk of malignancy correlated with datta et al.[7]

CONCLUSION

Reporting the cytology of salivary gland lesions by Milan system is helpful to stratify risk, provide clue to clinician for further management and to identify risk of malignancy in different categories. By Applying Milan system, we can decrease false positive and false negative cases.

REFERENCES

1. Viswanathan K, Sung S, Scognamiglio T, Yang GCH, Siddiqui MT, Rao RA. The role of the Milan System for Reporting Salivary Gland Cytopathology: A 5-year institutional experience. Cancer Cytopathol. 2018 Aug;126(8):541-551. doi: 10.1002/cncy.22016. Epub 2018 May 24. PMID: 29797690.
2. Ishani Gupta, Anam Khurshid and Subhash Bhardwaj 2021. Assessment of Milan System for reporting salivary gland cytopathology and risk of malignancy. International Journal of Health and Clinical Research. 4, 9 (May 2021), 42–44.
3. Kala C, Kala S, Khan L. Milan System for Reporting Salivary Gland Cytopathology: An Experience with the Implication for Risk of Malignancy. J Cytol. 2019 Jul-Sep;36(3):160-164. doi: 10.4103/JOC.JOC_165_18. PMID: 31359916; PMCID: PMC6592120
4. Singh G, Jahan A, Yadav SK, Gupta R, Sarin N, Singh S. The Milan System for Reporting Salivary Gland Cytopathology: An outcome of retrospective application to three years' cytology data of a tertiary care hospital. Cytojournal. 2021 May 6; 18:12. doi: 10.25259/Cytojournal_1_2021. PMID: 34221101; PMCID: PMC8248010.
5. Maleki Z, Baloch Z, Lu R, Shafique K, Song SJ, Viswanathan K, et al. Application of the Milan System for Reporting Submandibular Gland Cytopathology: An international, multi-institutional study. Cancer Cytopathology. 2019 May;127(5):306–15.
6. Sandhu V, Sharma U, Singh N, Puri A. Cytological spectrum of salivary gland lesions and their correlation with epidemiological parameters. Journal of Oral and Maxillofacial Pathology. 2017;21(2):203.
7. Datta B, Daimary M, Bordoloi K, Thakuria C. Cytopathological Spectrum of Salivary Gland Lesions According to Milan Reporting System: A Retrospective Study. apjcc [Internet]. 1Jul.2023 [cited 27Jan.2024];8(3):465-70. Available from: https://waocp.com/journal/index.php/apjcc/article/view/1028
8. Nguyen KA, Giang CT. Milan system for reporting salivary gland cytology in diagnosis and surgery of parotid gland lesions. American Journal of Otolaryngology [Internet]. 2023 Nov 1 [cited 2024 Jan 27];44(6):103988. Available from: https://www.sciencedirect.com/science/article/abs/pii/S01960 70923002028?via%3Dihub
9. Kumar M, Dwivedi P, Maurya M, et al. (October 20, 2023) Application of the Milan System for Reporting Salivary Gland Lesions and Its Cytohistological Correlation for Risk Stratification: A Single-Institution Experience. Cureus 15(10): e47383. doi:10.7759/cureus.47383
10. Higuchi K, Urano M, Akiba J, Nogami M, Hirata Y, Zukeran Y, et al. A multi-institutional study of salivary gland cytopathology: Application of the Milan System for Reporting Salivary Gland Cytopathology in Japan. Cancer Cytopathology. 2021 Sep 3;130(1):30–40.