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Original Research Paper

Pathology

CYTOMORPHOLOGICAL GRADING OF 100 SALIVARY GLAND LESIONS ACCORDING TO MILAN SYSTEM OF REPORTING IN TERTIARY CARE HOSPITAL.

Dr. S. Salma Sultana	Post Graduate
Dr. M. Neeraja	Professor
Dr. V. Siva Sankara Naik	Professor And HOD

ABSTRACT **Introduction:** Fine Needle Aspiration Cytology (FNAC), is used routinely with clinical and radiological findings for evaluation of salivary gland lesions (SGL) as it is diagnostically challenging due to significant cytological diversity and heterogenicity. **Aim/objectives:** To grade the salivary gland lesions according to MILAN System and to calculate the risk of malignancy (ROM). **Materials and Methods:** A 4 years retrospective and prospective study are conducted on 100 cases, at a Government Medical college, hospital, Anantapuramu from July 2018 to July 2022. All the relevant data, records and slides were assessed and correlated with histopathology for available specimens. **Results:** A total of 100 cases were studied. Case distribution in various categories were ND (8%), NN(42%), AUS(0%), NB(35%), SUMP(2%), SM(9%) and M(4%).overall ROM reported are ND(0%),NN(0%), AUS(0%), NB(10%), SUMP(100%), SM(50%) and M(100%).The sensitivity, specificity, positive predictive value and negative predictive value of the study are 71.42%, 96.29%, 83.33%,92.85%. respectively. **Conclusion:** The Milan system enables better communication, and uniform reporting helps in risk assessment.

KEYWORDS : Milan System, Risk of malignancy, Fine Needle Aspiration Cytology, Salivary gland lesions.

1. INTRODUCTION

Fine Needle Aspiration Cytology (FNAC), used routinely for evaluation of salivary gland lesions along with clinical and radiological findings and minimally invasive safe procedure, OPD based and cost-effective[1-4]. Results are rapidly assessed and provides sufficient information for preoperative surgical planning if needed[5,6].

Disadvantages of FNAC overlapping of benign and malignant features due to heterogenicity of salivary gland tissue, lack of cellular complexity of tumours among same subtypes,within the individual tumor[7-10].Due to the lack of a standardized, Milan System for Reporting Salivary Gland Cytopathology (MSRSGC) was introduced in 2015 in Milan.

2. MATERIALS AND METHODS

The study was conducted in the Department of Pathology for 4 years, July 2018 to July 2022. FNAC performed in 100 patients with SGL,and histopathology followup was done wherever possible.

FNAC done using 10ml syringe with 22 gauge needle from 2-3 different sites to ensure adequate material had been aspirated from different parts of the lesion and smears fixed in 95% alcohol and stained with H&E stain. Cytological features were evaluated, cases reclassified according to MSRSGC as follows shown in Table 1.

Table 1. The Milan system for reporting salivary gland cytopathology

Diagnostic category	Risk of Malignancy (%)	Management
I. Non diagnostic	25	Clinical and radiologic correlation/ repeat FNAC
II. Non neoplastic	10	Clinical follow up and radiological correlation
III. Atypia of undetermined significance (AUS)	20	Repeat FNAC or surgery
IV. Neoplasm Neoplasm: Benign Neoplasm: Salivary gland neoplasm of uncertain malignant potential (SUMP)	<5 35	Surgery or clinical follow up Surgery
V. Suspicious for Malignancy (SM)	60	Surgery
VI. Malignant	90	Surgery

Out of 100 cases, 34 specimens were available for histopathology. The specimens fixed in 10% formalin, processed, slides were stained with H&E stain. The results analysed statistically to calculate ROM for each category and to evaluate sensitivity, specificity, positive and negative predictive values.

3. RESULTS

The distribution of cases in relation to age, sex and location of the lesion is depicted in Table 2.

Table 2. Distribution of cases according to age, sex and site of involvement

Parameter	No. of cases
Sex	
Male	53
Female	47
Age(years)	
<20	07
21-30	14
31-40	20
41-50	28
51-60	11
>60	20
Gland involved	
Parotid	74
Submandibular	04
Minor salivary gland	02

Study showed mild male predilection with male to female ratio of 1.1:1. Maximum number of cases seen in age group of 21 to 40 years (28%), followed by 20% in age group 41 to 60 , >60 years. 74% of cases seen to involve parotid gland, 24% in submandibular gland and 02% cases in minor salivary

glands. The categorisation of cases according to MSRSGC is shown in Table 3.

Table 3. Categorisation of cytodiagnosis according to Milan system along with histopathological correlation and risk assessment

Category	Category 1	Category 2	Category 3	Category 4a	Category 4b	Category 5	Category 6	Total
Number of cases	8	42	0	35	2	9	4	100
Number of cases with histopathological follow up	5	12	0	10	1	2	4	34
Benign: Non-neoplastic	3	12	0	0	0	0	0	15
Benign: Neoplastic	2	0	0	9	0	1	0	12
Malignant	0	0	0	1	1	1	4	7
Risk of malignancy	0%	0%	0%	1/10 10%	01/01 100%	01/02 50%	04/04 100%	7/34 20.58 %

NN constituted largest category (42%), followed by NB category (35%). ND,AUS, SUMP,SM and M categories were 8%, 0%,2% 9% and 4%there were no AUS cases in this study.

In category 1 (ND), out of 8 cases, 5 were available for histopathological examination.. ROM reported as 0%. In category 2 (NN), out of 42 cases, 12 available for histopathology.. ROM reported as 0% Category 4a (NB), out of 35 cases, 10 available for followup in which one case reclassified as malignant. ROM reported as 10%.

Category 4b (SUMP) out of 2 cases, one was available for histopathology and was diagnosed as Adenoid cystic carcinoma(AdCC). ROM reported as 100%.

Category 5 (SM) out of 9 cases, 2 were available for follow up . ROM reported as 50%.

Category 6 (M) all 4 cases were available for follow-up and were confirmed on histopathology.. ROM reported as 100%. The overall ROM of 34 cases is 20.58%.

4. DISCUSSION:

MSRSGC proposed six categories: ND, NN, AUS, NB, SUMP, SM and malignant with ROM of 25%, 10%, 20%, 5%, 35%, 60% and 90% for each category respectively[12,13].

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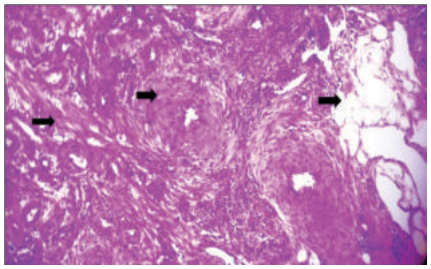
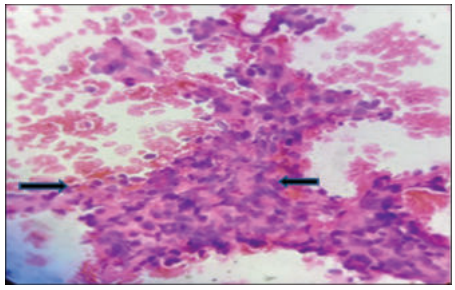
Category 1 (ND) cases where material aspirated is insufficient for providing information for diagnosis. In our study there were 8 ND cases, 5 came for follow-up and 3 were confirmed as mucinous cysts and other two as benign which are PA and angiomyolipoma.(Fig 1).



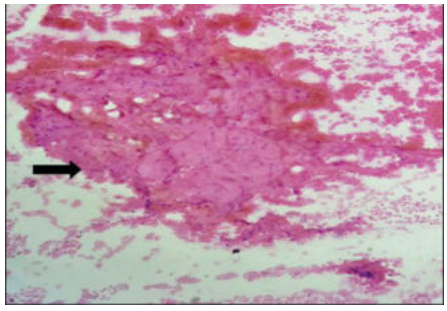
H&E 10X view Section is from parotid region showing smooth muscles arranged in bundles with benign nuclear morphology, dysmorphic thickened blood vessels and sheets and clusters of mature adipose tissue. In a study by Kala et al, 2 cases that were diagnosed as ND on cytology, were confirmed as chronic sialadenitis after histopathology. Loss of acini, marked fibrosis could be possible reasons misdiagnosis. Another case of AdCC diagnosed as ND, as aspiration from cystic areas yielded acellular smears[12].

12 out of 42 cases were available for histological follow-up in category 2(NN). All were correctly diagnosed as non-neoplastic lesions in histopathology..

Category 4a (NB) had 35 cases,10 came for histopathology. The majority of cases were PA (Fig.2 –A,B)



A) PA, in H&E 40 x view showing round to oval ductal epithelial cells with scant to moderate eosinophilic cytoplasm and round to oval nucleus.These cells show rimming of myoepithelial cells seen.



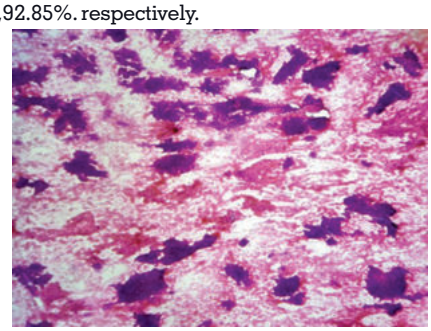
B) H&E 40 x view Chondromyxoid stroma seen .

In our study, 10 cases diagnosed as PA in FNAC which 8 cases were confirmed in histopathology as same. One case was a mismatch and it was confirmed as Warthin's tumour in histopathology and other case low-grade mucoepidermoid carcinoma(MEC). In another study, 3 cases of MEC were diagnosed as PA on cytology. Smears showed paucicellularity and bland epithelial cells which could be intermediate cells[12]. Studies done by Kotwal et al and Noor et al observed similar findings in their cases[13,14]. Two cases of carcinoma ex-PA were underdiagnosed as PA due to failure to recognize the malignant component, due to sampling error in the FNAC. AdCC is considered most common false-positive diagnosis for PA.

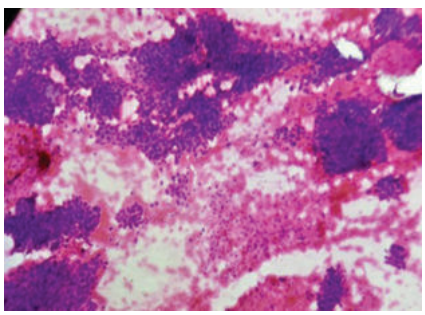
Category 4b (SUMP) includes cases cytological features are suggestive of a neoplastic lesion, but cannot distinguish efficiently between a benign and malignant neoplasm. We had 2 cases diagnosed as SUMP, and one case reclassified as AdCC on histopathology. FNAC, smears showed tumour with magenta coloured matrix but cells were not arranged around hyaline globules, which is typical feature of AdCC. The suspicious for malignancy (SM) category is reserved for cases, where overall cytomorphological features suggest malignancy, but do not show all criteria for specific diagnosis of malignancy[14]. AUS, SUMP, and SM represent the intermediate categories in Milan system[15]. In our study, 9 cases reported as suspicious for malignancy,and only two available and they reclassified as PA and other, metastasis of squamous cell carcinoma.

Category 6 (M) cytological features are diagnostic of malignancy. 4 cases diagnosed as malignancies on cytology in current study were confirmed on histopathology, were Carcinoma ex PA, papillary adenocarcinoma (Fig 3 A,B) ,polymorphous low-grade adenocarcinoma and AdCC. ROM was 100% in this category.

The sensitivity, specificity, positive predictive value and negative predictive value of the study are 71.42%, 96.29%, 83.33%,92.85%. respectively.



A)H&E 4x view highly cellular smears show round to oval tumor cells in papillary sheets,groups and well formed acini.



B)H&E 40x view cells show moderate amount of cytoplasm with hyperchromtic nucleus. papillary adenoocarcinoma of left submandibular gland.

5. CONCLUSION

PA was commonest benign tumour. New formulation of Milan system has served to bridge the communication barrier between pathologists and clinicians. To conclude, FNAC salivary glands is safe,OPD procedure and considered as first investigation in management of SGL.

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