

To assess the usefulness of the Milan System of Reporting of Salivary lesions over the routine unstandardised reporting system in risk stratification and patient care

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INTRODUCTION

FNAs of salivary gland is a cost effective method of evaluation of salivary gland lesions as it is low risk compared to incisional biopsy[1]. There is considerable variation in reporting salivary gland lesions as there is lack of architectural features in some cases and also cytomorphological overlap amongst the different salivary gland tumours[2]. All this led to low sensitivity of salivary gland FNA especially in some neoplasms of salivary gland. Till recently there was no uniform classification system for reporting salivary gland FNA though there was a need for a standard cytology reporting method of salivary gland lesions. A new classification system was proposed by Authors like Griffith et al and Wang et al based on risk stratification scheme, similar to the Bethesda system in Thyroid cytology[3]. Risk stratification is an intentional, planned and pro active process carried out in practice level to effectively target clinic service to patients. The aim of classification was that the classification should be user friendly and internationally accepted. The aim of the proposed classification system was also to help the pathologist to avoid the pit falls due to overlapping features of different tumours. The reporting categories were proposed to be evidence based and targeted to optimal patient care. The standardization effort of salivary gland cytology started in September 2015 at the European Congress of Cytology held in Milan, Italy. The Milan Study Group, an international panel of experienced cytopathologists, histopathologists, molecular pathologists and ENT surgeons formulated a uniform cytological reporting system called "The Milan System for reporting salivary gland cytopathology" based on risk stratification. This classification was introduced by the International consortium of experienced health care professionals sponsored by American Society of Cytopathology and International academy of cytologists. The Milan system is (MSRSGC) is a uniform international standardized reporting system. It is a 6 tiered evidence based classification system associated with average risk of malignancy providing likelihood of malignancy for each category and clinical management strategies[4]. Risk evaluation is potentially useful for patient management as it determines the extent of surgery and avoids surgery in non neoplastic cystic cases.

OBJECTIVE

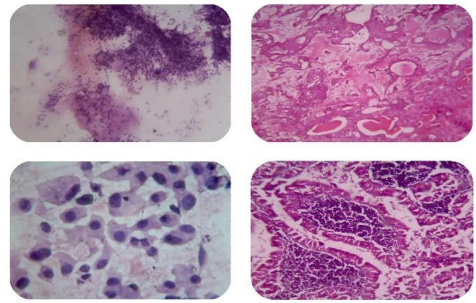
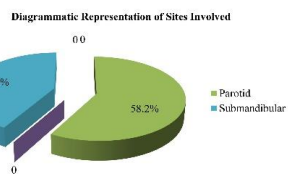
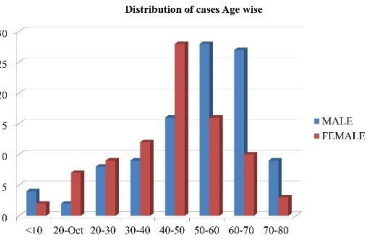
1. To classify salivary gland FNA according to the 6 categories of Milan system of reporting.
2. To compare with final Histopathology diagnosis, the gold standard, whenever it is available.
3. To calculate the risk of malignancy for each category.

MATERIALS AND METHODS

This is a retrospective study of FNAC of salivary gland lesions. All the FNA slides of salivary gland lesions in a period of 2 years were retrieved and studied and placed in six diagnostic categories as per MSRSGC as Non diagnostic, Non neoplastic lesions, Atypia of Undetermined Significance(ALS), Benign, Salivary gland neoplasm of uncertain malignant potential(SUMP), Suspicious for malignancy and Malignant. Histopathology follow up slides were reviewed for all available cases.

RESULTS

- Our study included 191 cases of salivary gland FNAC s over a period of 2 years which comprised 97 male and 83 female patients. Men in the age group of 50 to 60 years were commonly affected.
- Parotid lesions were the commonest followed by submandibular involvement. T.ingual and other minor salivary glands were not seen in our study. FNA smears of all 191 cases were reviewed and re-classified using the MILAN reporting system. Non neoplastic lesions(Milan Group-I) were the commonest with 107 (56%)cases.
- The neoplastic lesions included 50(27.2%) benign, 63.2%) Salivary gland neoplasm of uncertain malignant potential (SUMP), 2 suspicious (1%)and 19 (10%)malignant cases. Histological follow up was available for the 191 cases(14.65%).
- The most common histopathological diagnosis was pleomorphic adenoma in the benign category and mucocystic carcinoma in the malignant category on histology.Parotid had the highest number of malignancies with 9 cases and submandibular gland had 4 cases. There was 85.7% histocytological concordance in our study cohort. Of these 28 cases, 5 were discordant.
- The cases that were discordant on histopathology were 3 in non neoplastic cystic category(Milan Group-II) and 2 in the classical benign category(Milan Group-IV). We had histopathology follow up in total of 8 cases in Suspicious for malignancy and Malignant group(V&VI). All were malignant in HP.
- Among the true positives in malignant category, we had 2 metastatic deposits, 1 Mucocystic carcinoma, 1 Squamous Cell Carcinoma, 1 poorly differentiated tumour and 1 case of Malignant Osteocytoma.



FNA with corresponding Histopathological photograph of pleomorphic adenoma and malignant osteocytoma

S. No.	No. of cases in cytology %	HP follow up of available cases	Concordant/Discordant diagnosis on HP*	Risk of Malignancy
1	2/1	0	0/0	-
2	107/56	7	4/3	33%
3	5/2.6	1	1/0	100%
4a	50/26.2	10	8/2	18.1%
4b	6/3.2	2	2/0	50%
5	2/1	1	1/0	100%
6	19/10	7	7/0	100%

Classification of cases based on Milan Reporting System with estimated Risk Of Malignancy

DISCUSSION

- FNA of salivary gland has been documented to be an effective diagnostic tool in optimizing surgical intervention and follow up in patient care. Our study had 191 salivary gland aspirates of which 54% were that of male patients population. In our study 58.2% were parotid lesions and the rest were submandibular lesions. There were no minor salivary gland lesions in our study. Parotid gland was most commonly involved in most other studies with involvement of 61% to 93%(2,3,5-9).
- Our original Cytology diagnosis of these 191 cases were inflammatory and cystic, Benign Neoplasms, Suggestive of Neoplasms/could not be defined benign/malignant/cases, Suspicious for malignancy and Malignant cases.
- The 191 cases were re-classified according to the recently introduced MSRSGC into 6 diagnostic categories - Non diagnostic, non neoplastic, atypia of undetermined significance, neoplasm benign or salivary gland neoplasm of uncertain malignant potential, suspicious for malignancy and malignant.
- In the current study, we had maximum of 107 cases in non neoplastic category. (Milan Group II) Other studies[2] had also stated high number of cases in this group. Histopathology follow up was available in 7 cases in this category. FNA of non-neoplastic cystic conditions significantly limits surgery in non neoplastic lesions which has been highlighted in literature with surgery being reduced in around 65% cases in parotid lesions.3 of the 7 cases reported as infected cystic lesion on cytology were confirmed to be monomorphic adenoma, basal cell adenoma and low grade mucocystic carcinoma on histology. Monomorphic adenoma and low grade mucocystic carcinoma were one of the most discordant salivary gland lesions in other studies. The cystic lesions can be classified as non diagnostic or as Atypia of undetermined significance in the Milan Classification System than as non-neoplastic so that group II has fewer cases[10].
- Atypia of undetermined significance in a newly introduced entity in reporting of salivary gland lesions. Our study had 2.6%(5 cases) in Atypia of undetermined significance group. One case had zip follow up and was diagnosed to be Acinic cell Carcinoma. FNA and histology concordance of Acinic Cell Carcinoma is 93-91% in our studies. ROM was 100% for this group in our study. The ROM for this group according to MSRSGC should be around 20%. As we had HP correlation in only one case out of 5 cases, our ROM was high. The ROM for this category in other studies were also 100% and 53% in other studies[2,5].
- The neoplastic lesions in cytology included 50 benign (27.2%), 6 Salivary gland neoplasm of uncertain malignant potential (3.2%), 2 suspicious for malignancy (1%)and 19 (10%)malignant cases. 2 cases reported as PA on cytology turned out to be carcinoma ex pleomorphic adenoma and low grade mucocystic carcinoma on histology. This is a known pitfall in salivary gland cytology.
- The Sensitivity and Specificity was 79% and 100% in our study. Various other studies show varying Sensitivity between 62% to 97.6% and specificity from 94.3% to 100%, in salivary gland cytology[11-14].

CONCLUSIONS

Assessment of salivary gland cytology by Milan system will bring a universally standardised method of reporting like Bethesda system of thyroid cytology. The newly introduced categories of Atypia of unknown significance and salivary gland neoplasm of unknown malignant potential in MSRSGC would potentially help to bring down the rate of false negative cases. The other categories of Suspicious for malignancy and Malignant, already has high sensitivity and is highly concordant in most studies.

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