

Cytopathological study of salivary gland lesions in rural population: Use of the Milan system for reporting

Mahammadtalha B.¹, Swami S.Y.²

¹Dr. Bagwan Mahammadtalha, Post Graduate Student, ²Dr. Sunil Y. Swami; Associate Professor, both authors are affiliated with Department of Pathology, S.R.T.R. Government Medical College, Ambajogai, Maharashtra, India.

Corresponding Author: Dr. Sunil Y. Swami, Bhagwanbaba Chowk, Gitta-Road, Shepwadi, Taluka: Ambajogai, District- Beed, Maharashtra, India. E-mail: drsys02@gmail.com

Abstract

Introduction: Salivary gland lesions are superficial lesions & seek attention of patient easily. These lesions vary from non-neoplastic to neoplastic ones and from benign to malignant. Impact of changing habits of people may be reflected in spectrum of oral health & lesions of salivary glands. **Objectives and Method:** Present study includes the spectrum of distribution of various lesions of salivary glands in the patients visiting tertiary care rural hospital. In the present study, the Milan system was used for reporting salivary gland cytopathology in 150 cases. **Results:** FNAC proved to be a safe and effective modality in diagnosis and planning management of patients with salivary gland lesions in the rural based population. **Conclusion:** Milan system was found characteristically significant for cytopathological diagnosis of SGLs.

Key words: Milan system, Cytopathology, Salivary gland, Rural population

Introduction

Salivary gland diseases usually present as a swelling of the affected gland. FNAC (Fine needle aspiration cytology) is being increasingly used in the diagnosis of the salivary gland swellings [1]. Salivary gland lesions comprise 2-6.5% of all head and neck neoplasms in adults.

The common presentation is an enlarged mass which is usually accessible for FNAC. Salivary gland tumors are not common; moreover, the associated histopathology of these tumors is extremely varied and complex due to the presence of epithelial and non-epithelial neoplasms, lymphomas, metastatic tumors and non-neoplastic lesions in the salivary glands [2].

The rapidity for diagnosis, low morbidity and a high diagnostic accuracy makes FNAC a popular method for evaluating the salivary gland neoplasms before any surgical intervention [3].

Results

In the present study, 150 cases of SGLs (Salivary gland lesions) were studied in rural based population by using the Milan System of reporting cytology.

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Material and Methods

This study included 150 patients presented with salivary gland swellings.

Type of study: Prospective and observational study.

Inclusion criteria: All cases of salivary gland lesions were included in the present study.

Exclusion criteria: Patients on conservative treatment and those referred to other hospitals were excluded from the study.

Detail clinical history was taken, and local examination followed by systemic examination was done in all patients. After taking consent, FNAC was done using 21-23-gauge needle attached to a 10 ml syringe and smears were prepared. Smears were wet fixed in 95% ethyl alcohol at least for 30 minutes and Papanicolaou (Pap) staining was done. Air dried smears were stained with May-Grunwald Giemsa (MGG) stain. Stained smears were mounted with DPX (dextrene polystyrene xylene) and examined under the light microscope.

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Out of 150 cases, maximum lesions i.e.84 (56%) were observed in submandibular salivary gland followed by 53 (35.33%) and 09 (06%) lesions in parotid and sublingual salivary glands respectively. 4 lesions (2.67%) were observed in minor salivary glands.

Table-1: Frequency distribution pattern in SGLs:

Category	Cyto-diagnosis:	Male	Female	Total	%	
I	Non- Diagnostic.	11	05	16	10.67	
II	Non- Neoplastic.	32	38	70	46.67	
III	AUS.	05	04	09	06.00	
IV	Neoplasm:	A. Benign:	18	17	35	23.33
		B. SUMP:	02	00	02	01.33
V	SM:	03	03	06	04.00	
VI	Malignant:	08	04	12	08.00	
	Total	79	71	150	100	

Out of 150 cases, maximum lesions i.e. 70 (46%) were non-neoplastic followed by 37 (24.66%) of neoplastic lesions & 16 (10.67%) cases were non-diagnostic.

Non-neoplastic lesions included inflammatory, metaplastic and reactive lesions like acute, chronic & granulomatous sialadenitis, sialoadenosis & reactive lymphadenitis. About 9 (06%) cases of AUS [Atypia of undetermined significance] were observed which was within the frequency of Milan's system of classification i.e. 10%. Out of 37 cases of neoplastic lesions, 35 (23.33%) cases were of benign subcategory while 02 (01.33%) cases were of SUMP [Salivary gland neoplasm of Uncertain Malignant Potential]. 6 (04%) cases were observed in category of suspicious of malignancy [SM].

12 (08%) cases were observed as malignant lesions. In our study, the age group of the patients ranged from 02 to 90 years with the mean age of 39.7 years. 79 cases were males and 71 cases were females with M: F ratio of 1.11:1. Non-neoplastic lesions [Category II] were commonly seen in the age group of 21-30 years while neoplastic lesions [Category IV] were commonly seen in the age group of 20 - 60 years. Malignant lesions and lesions with suspicious of malignancy [Category V & VI] were commonly seen in the age group of 50 -70 years.

Table-2: Cytopathological categories of salivary gland lesions.

SGLs	M	F	Total	%
Non-diagnostic samples	11	05	16	10.67
Sialoadenosis	01	00	01	0.67
Acute sialadenitis	10	06	16	10.67
Chronic sialadenitis	05	03	08	05.34
Granulomatous sialadenitis	01	00	01	1.67
Lymphadenitis [Acute, reactive, chronic, granulomatous]	14	29	43	28.67
Non-mucinous cysts	00	01	01	00.67
AUS.	05	04	09	06.00
Pleomorphic adenoma	17	15	32	21.34
Basal cell adenoma[BCA]	01	02	03	02.00
SUMP	02	00	02	01.33
Other suspicious for malignancies	03	03	06	04.00
Mucoepidermoid carcinoma[MEC]	02	00	02	01.33
Lymphomas	04	02	06	04.00
Metastasis	02	02	04	02.67
Total	79	71	150	100.00

Out of 150 cases, 16 cases (10.67%) were non-diagnostic, 16 (10.67%) cases were of acute sialadenitis, 08 (5.34%) cases were of chronic sialadenitis, 43 cases (28.67%) of lymphadenitis including acute, chronic, granulomatous and tuberculous lymphadenitis, 32 (21.34%) cases were of PA, 3 (2%) cases were of BCA, 2 (1.33%) cases were of high grade MEC, 6 (04%) cases each of suspicious or malignant lesions & lymphoma respectively, 4 (2.67%) cases of secondaries from epithelial malignancies & 01(0.67%) case each of sialo-adenosis and non-mucinous cyst respectively.

Discussion

FNAC has been well established role in the diagnosis of SGLs & it is a safe, cost-efficient, minimally invasive procedure that helps the clinicians in the formulation of further management [4,5]. However, at many times it becomes a tedious job to diagnose accurately, mainly due to the similar microscopic picture of normal salivary gland elements, heterogeneous nature of salivary gland lesions, overlapping features between benign and malignant lesions, presence of cystic components, and oncocytic metaplasia [6]. Aspirates from SGLs in category I were reported as non-diagnostic only after processing & examining all the material. Cases with mucinous cyst contents were included in AUS category.

Table-3: Comparison of distribution of SGLs:

Category	Studies				
	Jaiswal P et al [7].	Viswanathan K et al [8].	Savant D et al [9].	Montezuma D et al [10].	Present study
I	3(4.91%)	75(12%)	18(9.2%)	28(7.21%)	16(10.67%)
II	15(24.59%)	179(28.5%)	4(2%)	89(22.93%)	70(46.67%)
III	1(1.64%)	38(6.1%)	12(6%)	39(10.05%)	9(6%)
IV-A	28(45.90%)	197(31.4%)	118(59.2%)	156(40.21%)	35(23.33%)
IV-B	1(1.64%)	62(9.9%)	22(11%)	55(14.18%)	2(1.33%)
V	1(1.64%)	17(2.7%)	3(1.5%)	7(1.80%)	6(4%)
VI	13(21.31%)	59(9.4%)	22(11%)	14(3.60%)	12(8%)
Total	61(100%)	627(100%)	199(100%)	388(100%)	150(100%)

In the present study, non-diagnostic cases [I] were 16 (10.67%) which is comparable with the study done by Viswanathan K et al [8] & Savant D et al [9].

This comprised of smears with less than 60 lesional cells, poorly prepared slides with artifacts [Fig:1A], slides with normal salivary gland elements in unilateral swellings, non-mucinous cyst contents showing cyst fluid only or histiocytes [Fig. 1B].

Aspirates lacking clear cytomorphologic evidences of neoplastic process were reported as category II: non-neoplastic. In our study, non-neoplastic SGLs included were acute sialadenitis [Fig:1 C], chronic sialadenitis [Fig:1D], granulomatous/tuberculous sialadenitis [Fig: 2A, B, C], sialoadenosis, sialolithiasis and reactive lymph node hyperplasia's. Being this study done in rural population, it seems that non-neoplastic lesions i.e. 70(46.67%) were observed more as compared to other studies. Mucinous cyst lesions [Fig: 2D], reactive atypia [Fig: 3A] observed in the smears were included in AUS / category III which was comparable i.e.09 (06%) to the studies done by Viswanathan K et al [8] & Savant D et al [9].

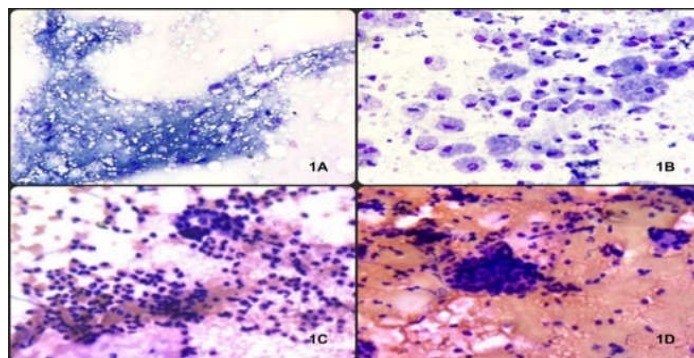


Fig. 1A: Nondiagnostic [I]: Inadequate smear: shows less than 60 cells in the background of hemorrhage [MGG: 5X]

Fig.1B: Nondiagnostic [I]: Non-mucinous cyst: shows plenty of cyst macrophages [MGG: 40X].

Fig.1C: Non-neoplastic [II]: Acute sialadenitis: shows occasional epithelial cells admixed with plenty of polymorphs. [PAP: 10X]

Fig.1D: Non-neoplastic [III]: Chronic sialadenitis: shows acinar cells & lymphocytes in the hemorrhagic background. [PAP: 10X]

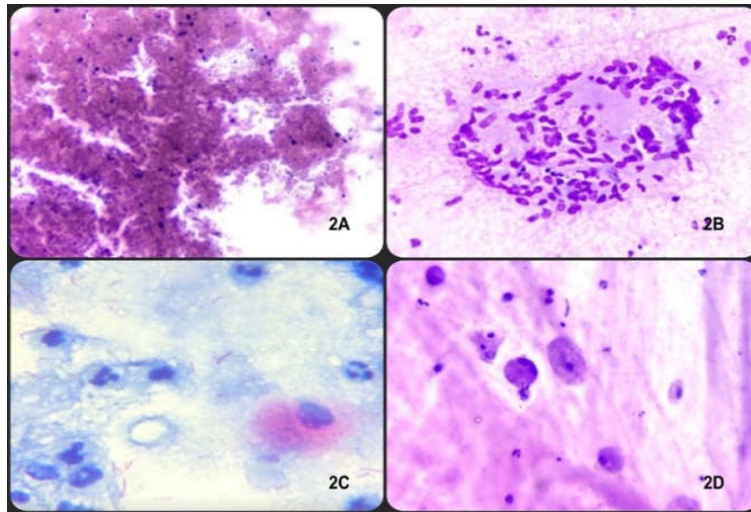


Fig.2A: Non-Neoplastic [III]: Tuberculous lymphadenitis: shows few inflammatory cells admixed with abundant caseous necrosis. [PAP: 10X]

Fig.2B: Non-neoplastic [II]: Tuberculous lymphadenitis: shows epithelioid cells & foreign body giant cells. [MGG: 40X]

Fig.2C: Non-neoplastic [II]: Tuberculous lymphadenitis: shows acid fast bacilli. [ZN stain: 40X]

Fig.2D: AUS [III]: Mucinous cyst: shows cyst macrophages (mucinophages) in the background of abundant mucin. [MGG: 40X].

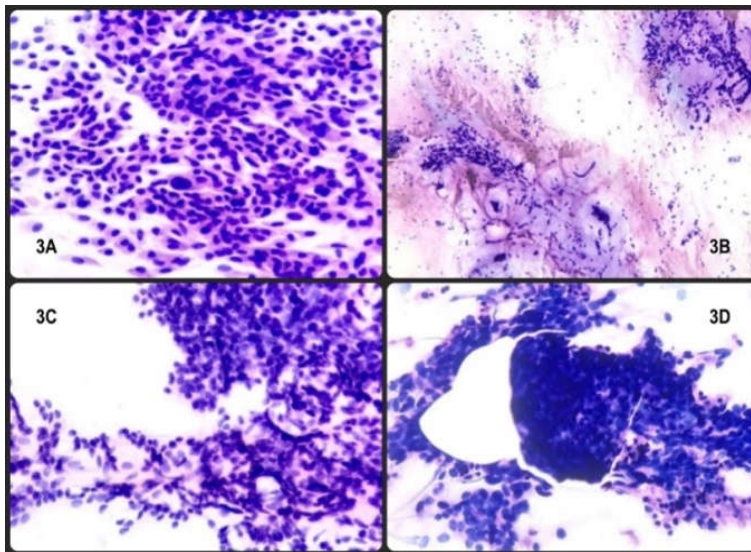


Fig.3A: AUS [III]: shows epithelial cells admixed with occasional atypical cells with large hyperchromatic nuclei. [PAP: 40X]

Fig. B: Neoplasm [IV: A]: PA shows epithelial cells & mesenchymal spindle cells in the chondromyxoid ground substance. [PAP: 10X]

Fig.3C: Neoplasm [IV: A]: Basal cell adenoma (Trabecular variant): shows multiple hyaline stromal globules surrounded by bland epithelial or basal cells. [PAP: 40X]

Fig.3D: Neoplasm [IV: B]: SUMP: Highly cellular PA with atypia: shows highly cellular, matrix poor pleomorphic adenoma with atypia. [PAP: 40X]

The benign neoplasms with no definite evidence of malignancy were reported in category IV i.e. Neoplastic: A- Benign. 35 (23.33%) cases including PA [Fig: 3B] and BCA [Fig: 3C] were observed in this study which was comparable to study done by Viswanathan K et al [8].

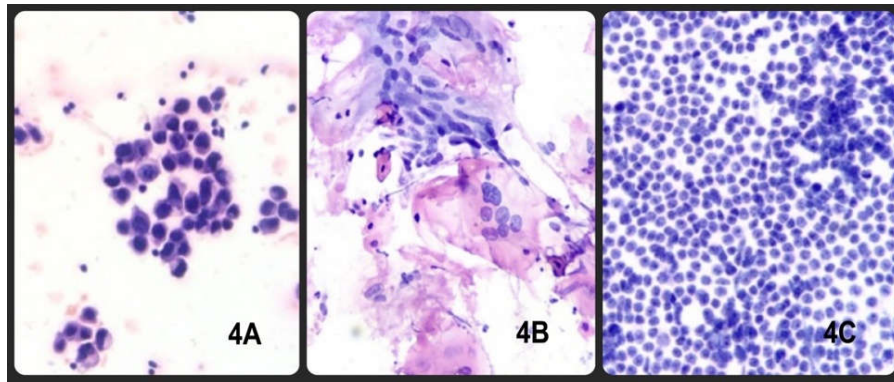


Fig.4A: Suspicious for malignancy [V]: shows groups of markedly atypical cells with hyperchromatic nuclei. [PAP: 40X]

Fig. 4B: Malignant [VI]: SCC: shows malignant squamous cells admixed with foreign body giant cells. [PAP: 40X]

Fig. 4C: Malignant [VI]: NHL: shows monomorphic population of lymphoid cells [PAP: 40X]

In the category IV/ Neoplastic: B: SUMP, two cases i.e. 2(1.33%) [Fig: 3D] with high cellularity and or atypia with suspicious of malignant potential were included which was comparable to previous study done by Jaiswal P et al [7].

6 (04%) cases [Fig: 4A] of SM were observed in our present study which showed markedly atypical cells. 12 (08%) cases of malignant SGLs were observed in our study which included MEC, SCC [Fig: 4B], NHL [Fig: 4C] and metastasis, which was comparable to study done by Viswanathan K et al [8].

Table-4: Comparison of age wise distribution pattern in SGL:

Present study showed maximum cases in age group of 31-40 years with a mean age of 39.7 years, which was comparable to studies done by Kakoty S et al [11] & Shafkat A et al [13].

Age Group (Years)	Studies							
	Kakoty S. et al [11].		Dalve K. et al [12].		Shafkat A. et al [13].		Present study	
	Cases	%	Cases	%	Cases	%	Cases	%
0-10	00	00	01	01.08	05	05	12	08.00
11-20	07	14	13	14.13	12	12	19	12.67
21-30	10	20	14	15.21	22	22	25	16.67
31-40	15	30	11	11.96	26	26	26	17.33
41-50	10	20	18	19.57	18	18	23	15.33
51-60	06	12	11	11.96	12	12	17	11.33
61-70	02	04	19	20.65	04	04	22	14.67
71-80	00	00	04	04.36	01	01	04	02.67
81-90	00	00	01	01.08	00	00	02	01.33
Total	50	100	92	100	100	100	150	100

Table 5: Comparison of sex wise distribution pattern in SGLs:

Studies	M	F	M:F
Jain C. ¹⁴	42 (52.5%)	38 (47.5%)	1.10: 1
Gandhi SH et al. ¹⁵	53 (58.8%)	37(41.1%)	1.43: 1
Singh Nanda et al. ¹⁶	90 (70.8%)	37(29.1%)	2.40: 1
Present study	79 (53%)	71 (47%)	1.11: 1

In the present study of 150 salivary gland lesions, male preponderance was observed with male to female ratio of 1.1: 1, which was comparable to studies done by Jain C [14] and Gandhi SH. et al [15].

Table-6: Comparison of site wise distribution pattern in SGLs:

Studies/ Sites	Parotid	Submandibular	Sublingual	Minor	Total
Jain C [14]	38 (54.28%)	31 (44.28%)		1(1.42%)	70
Singh Net al [16]	65 (51.1%)	47 (37%)	6 (4.7%)	9(7%)	127
Singh Aet al [17]	76(79.16%)	18 (18.75%)		2(2.8%)	96
Ashraf Aet al [18]	68 (68%)	30 (30%)		2(2%)	100
Vaidya Set al [19]	27 (46.5%)	27 (46.5%)	1 (1.7%)	3(5.2%)	58
Present study	53 (35.33%)	83 (56%)	9 (6%)	4 (2.67%)	150

In the present study of 150 cases of SGL's, submandibular gland was most commonly affected i.e. in 83 (56%) cases followed by parotid gland 53 (35.33%) cases and sublingual salivary gland 9 (6%) cases. Minor salivary glands were affected in 4 (2.67%) cases which was comparable to study done by Singh A et al [17] & Ashraf A et al [18].

Benign tumors were more common in the age group of 21- 60 year and malignant tumors were more common in the age group of 61-80 years which was comparable to the study done by Joshi A et al [20].

Conclusion

150 cases of SGLs were studied in rural based population by using the Milan system of reporting cytopathology. Submandibular salivary gland was most commonly affected followed by parotid gland, minor salivary glands and sublingual gland respectively. Age range in our study was from 2- 90 years with mean age 39.7 years. Male preponderance was observed with M: F of 1.11: 1. Non-neoplastic lesions were more common than neoplastic SGL's. Benign tumors were more common in the age group 21-40 years while malignant tumors were more common in the age group of 61-80years. PA was the most common benign tumor and MEC was the most common primary malignant tumor.

Role of FNAC, its diagnostic utility in the rural based population combined with the use of Milan System of reporting cytopathology in SGLs was found characteristically significant for cytological diagnosis.

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Findings: Nil; **Conflict of Interest:** None initiated

Permission from IRB: Yes

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