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Cytomorphological features of salivary gland lesions by fine needle aspiration cytology: A descriptive observational study

Dr Amol Rajhans

Lecturer, Dept of Pathology, Bharati Vidyapeeth Medical college, Pune, Maharashtra, India.

Abstract

Background: Fine Needle Aspiration Cytology (FNAC) of salivary gland is used worldwide for the diagnosis and management of salivary gland lesions as a vital investigative tool. It has high sensitivity (86-100%) and specificity (90-100%). Any unexplained salivary gland mass is an indication for FNAC, as it is a safe, reliable, cost effective and minimally invasive investigation tool. Salivary gland accounts for 2-6.5% of all the neoplasms of head and neck. Salivary gland swellings can range from reactive conditions to neoplastic ones. Salivary gland neoplasms constitute 2-6.5% of all the head and neck neoplasms. **Objective:** To study cytomorphological features of salivary gland lesions by fine needle aspiration cytology. **Materials and Methods:** This is descriptive observational study carried out at department of pathology at a tertiary care centre in Maharashtra during the period from January 2008 to December 2009 involving total 100 cases. **Results:** Mean age of the study population was 44.16±11.25 years. Majority of the cases were males i.e. 54% and remaining were females i.e. 36%. Male to female ratio in our study was 1.45:1. Distribution according to signs revealed that majority of the patients had swelling in the parotid region i.e. 40% followed by swelling in submandibular region-25% and ulcerations over swelling-11%. Milan system of reporting salivary gland cytopathology revealed the grading as follows: Cat IV A-52%, Cat II 27%, Cat VI 14%, Cat IV B-2%, Cat V-2%, Cat III-2% and Cat I-1%. **Conclusion:** Milan system of reporting salivary gland cytopathology revealed the grading as follows: Cat IV A-52%, Cat II 27%, Cat VI 14%, Cat IV B-2%, Cat V-2%, Cat III-2% and Cat I-1%.

Key words: Cytomorphological features, salivary gland lesions, fine needle aspiration cytology

Introduction

Fine Needle Aspiration Cytology (FNAC) of salivary gland is used worldwide for the diagnosis and management of salivary gland lesions as a vital investigative tool [1,2]. It has high sensitivity (86-100%) and specificity (90-100%) [1,2]. Any unexplained salivary gland mass is an indication for FNAC, as it is a safe, reliable, cost effective and minimally invasive investigation tool [3]. Salivary gland accounts for 2-6.5% of all the neoplasms of head and neck[3].

Bland Sutton aptly said "Tumors of the salivary gland are a pathological puzzle and a source of unsatisfactory speculation. The nature of the lesion cannot be determined on clinical examination and therefore pathological examination is required for definite diagnosis in suspected cases of neoplastic disease[4]. Salivary gland swellings can range from reactive conditions to neoplastic ones. Salivary gland neoplasms constitute 2-6.5% of all the head and neck neoplasms. Salivary gland lesions varying in size from 1mm to 10mm generally do not yield adequate aspirate for diagnosis. Whereas salivary gland lesions of more than 1 cm yield adequate aspirate[4]. Pathology of these lesions are diverse and includes developmental, inflammatory, benign and malignant tumors which can be primary or metastatic[5]

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SDC is similar histologically to intraductal and infiltrating carcinoma of the breast. Comedonecrosis is a common feature. Aggressive biologic behavior with a high incidence of lymph node metastasis, local recurrence and significant mortality justify categorization of SDC as a high-grade malignancy in the current classification of salivary gland neoplasms.[6,7]

Objective: To study cytomorphological features of salivary gland lesions by fine needle aspiration cytology.

Materials and methods

Place of study: The study was conducted at Tertiary Care Centre

Period of study: The study was conducted from Jan 2008 to Dec 2009.

Type of study: Prospective, Observational, Descriptive Study

Sample size: 100 cases (All the symptomatic patients with salivary gland lesion undergoing cytopathological study in study period).

Study design: This study includes a total of 100 fine needle aspirates obtained prospectively from patients who visit our pathology department with various salivary gland lesions.

Detailed research plan: Informed written consent was taken and all willing patients were examined & lump / lesions were palpated. The suspicious area was cleaned with cotton spirit swab. The skin over the lump / lesion was stretched and was stabilized with one hand between the index finger and thumb and multi-directional passes was done at different angles by moving the needle back and forth using a 5cc or 10cc disposable plastic syringe fitted with a 23-24G disposable needle, under constant negative pressure by retracting the plunger of syringe by creating vacuum in syringe till sufficient material is obtained in the needle hub.

The aspirated material was spread and smeared on properly labelled glass slides by gentle pressure with flat surface of another slide. The slides were then be submitted for staining as per the protocol. All the slides were stained with Haematoxylin and Eosin (H.E.) stain and Leishman stain. Aspirates containing Blood / Cystic fluid was centrifuged & then smears was made from the deposits obtained after centrifugation. Microscopic examination & cytology report of stained smears was categorized accordingly to the Milan System of Reporting Salivary Gland Cytopathology.

Inclusion Criteria:

Those with following indications would be evaluated:

1. All non-neoplastic and neoplastic lesions of salivary gland referred by clinician for FNAC irrespective of gender and age.
2. All patients undergoing FNAC and given written informed consent for the study.

Exclusion Criteria:

1. Swelling with scanty/ inadequate aspirate on smear.
2. Patient not willing to give written consent for FNAC.
3. Patient with bleeding tendency/ diathesis.

Method of collection of data

The study was performed after approval from the ethics committee The identification of the type of specimen was done.

- Dimensions of specimen (cm × cm × cm)

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- External surface (smooth, bosselated, irregular)
- Adequate representative section will be given as required.
- Sections will be stained by routine H& E.

Data entry and analysis

Data entry was done with Statistical Package for Social Sciences (SPSS IBM) version 21.0 and data entry checks will be done at regular intervals to ensure valid entries. Analysis of data was done with SPSS IBM version 21.0. Both univariate and bivariate analysis was done. Proportions was calculated for qualitative variables and mean with standard deviation will be done for quantitative variables. Required tests of significance such as chi square tests and independent t tests was applied. Significance of p value was taken as $p< 0.05$.

Results

Table 1: Distribution according to age group and gender

		Frequency	Percent
Age group in years	10 to 20	4	4.0
	21 to 30	15	15.0
	31 to 40	21	21.0
	41 to 50	25	25.0
	51 to 60	28	28.0
	>60	7	7.0
	Total	100	100.0
		Frequency	**Percent**
Gender	Male	54	54.0
	Female	36	36.0
	Total	100	100.0

We included total 100 cases of salivary gland lesions in our study. Out of 100 cases, majority were from 51-60 years i.e. 28% followed by 25% from 41-50 years, 21% from 31-40 years, 15% from 21-30 years, 7% from above 60 years. Mean age of the study population was 44.16±11.25 years. Majority of the cases were males i.e. 54% and remaining were females i.e. 36%. Male to female ratio in our study was 1.45:1

Table 2: Distribution according to signs

		Frequency	Percent
Signs	Swelling in the parotid region	40	40.0
	Swelling in submandibular region	25	25.0
	Swelling in the parotid region with fixity	7	7.0

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	Swelling in submandibular region with fixity	9	9.0
	Ulcerations over Swelling	11	11.0
	Neck node palpable	7	7.0
	Facial nerve palsy	1	1.0

Distribution according to signs revealed that majority of the patients had swelling in the parotid region i.e. 40% followed by swelling in submandibular region-25%, ulcerations over swelling-11%, swelling in submandibular region with fixity-9%, swelling in the parotid region with fixity-7%, neck node palpable-7% and facial nerve palsy in 1%.

Table 3: Distribution according to signs

		Frequency	Percent
Location	Parotid	64	64.0
	Submandibular	34	34.0
	Sublingual	2	2.0
	Total	100	100.0

Location wise distribution of the cases revealed that majority of the cases were parotid i.e. 64%, submandibular-34% and least i.e. 2% sublingual.

Table 4: Distribution according to signs

		Frequency	Percent
Milan System	Cat I	1	1.0
	Cat II	27	27.0
	Cat III	2	2.0
	Cat IV A	52	52.0
	Cat IV B	2	2.0
	Cat V	2	2.0
	Cat VI	14	14.0
	Total	100	100.0

Milan system of reporting salivary gland cytopathology revealed the grading as follows: Cat IV A-52%, Cat II 27%, Cat VI 14%, Cat IV B-2%, Cat V-2%, Cat III-2% and Cat I-1%.

Discussion

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We included total 100 cases of salivary gland lesions in our study. Out of 100 cases, majority were from 51-60 years i.e. 28% followed by 25% from 41-50 years, 21% from 31-40 years, 15% from 21-30 years, 7% from above 60 years. Mean age of the study population was 44.16±11.25 years. Majority of the cases were males i.e. 54% and remaining were females i.e. 36%. Male to female ratio in our study was 1.45:1 **(Table 1)**

Distribution according to signs revealed that majority of the patients had swelling in the parotid region i.e. 40% followed by swelling in submandibular region-25%, ulcerations over swelling-11%, swelling in submandibular region with fixity-9%, swelling in the parotid region with fixity-7%, neck node palpable-7% and facial nerve palsy in 1%. **(Table 2)**
Location wise distribution of the cases revealed that majority of the cases were parotid i.e. 64%, submandibular-34% and least i.e. 2% sublingual. **(Table 3)**

Milan system of reporting salivary gland cytopathology revealed the grading as follows: Cat IV A-52%, Cat II 27%, Cat VI 14%, Cat IV B-2%, Cat V-2%, Cat III-2% and Cat I-1%. **(Table 4)**

Jayram G et al[8] in their study reported that Salivary gland lesions are relatively rare, but their diverse pathology makes FNAC diagnosis challenging. Neoplasms are the most common salivary gland conditions evaluated by FNAC. **Jayram G et al[8]** in their study reported that 59.6% of cases were neoplastic, though this may be skewed due to hospital-based sampling. 21.5% were nonneoplastic lesions. Gland-specific malignancy rates: Palatal tumors: 33.3% malignant and parotid tumors: 13% malignant.

Conclusion: Milan system of reporting salivary gland cytopathology revealed the grading as follows: Cat IV A-52%, Cat II 27%, Cat VI 14%, Cat IV B-2%, Cat V-2%, Cat III-2% and Cat I-1%.

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