



Original Research Article

A Study of Salivary Gland Lesions - By Fine Needle Aspiration Cytology

Lakshmibai B Mallappa¹, S V Balakrishna², A R Raghupathi³

¹Asst. Prof. of Pathology, Bangalore Medical College & Research Institute, Bangalore.

²Associate Prof. in Surgery, Travancore Medical College, Kollam, Kerala.

³Prof. & HOD, Department of Pathology, Bangalore Medical College & Research Institute, Bangalore.

Corresponding Author: Lakshmibai B Mallappa

Received: 23/01/2014

Revised: 24/02/2014

Accepted: 06/03/2014

ABSTRACT

Background: Fine Needle Aspiration Cytology (FNAC) is a very important diagnostic procedure for the evaluation of any swelling in the region of major and minor salivary glands. This technique is of great benefit as an alternate diagnostic approach to incisional biopsy & frozen section. It is also gaining importance in paediatric population. **Aims & objectives:** 1) This study aims to evaluate various lesions in the salivary glands such as inflammatory, non-neoplastic and neoplastic. 2) It also helps in the distribution of the various lesions seen in major and minor salivary glands. **Materials and Methods:** This study includes 28 cases out of 437 patients which presented with salivary gland swellings at our Institute. The period of study was from January 2011-March 2011 a duration of 3 months. FNAC was done by using 22G Needle. The smears were air-dried & stained by Giemsa stain. The rest were placed in methanol & stained by Hematoxylin and eosin (H&E) procedure. **Results:** The study included 28 cases, out of which 12 (42.85%) were Males and Females 16 cases (57.14%). The male to Female ratio is 1:1.33. The age ranged from 4 1/2 yrs to 70 yrs. The most common lesion was chronic sialadenitis followed by pleomorphic adenoma and mucoepidermoid carcinoma. FNAC was inconclusive in three cases.

Conclusion: The technique is safe, simple and plays an effective diagnostic role in salivary gland lesions. FNAC can also be recommended in paediatric age group. Its diagnostic accuracy is limited to tissue biopsy but still it is a good technique for both screening and follow-up. Pleomorphic adenoma and mucoepidermoid carcinoma were still the commonest benign and malignant lesions encountered respectively.

Key-words: Diagnostic, FNAC, Salivary gland lesions.

INTRODUCTION

Fine Needle Aspiration Cytology is one of the most valuable tests which are accepted worldwide. There is perhaps no tissue anywhere in the body like the salivary gland that is subject to such a diverse and heterogeneous range of tumours, though the anatomical structure of the gland is very simple. [1] The procedure is quite hazardous

as sampling error, facial nerve damage, fistula formation, violation of tissue planes and tumour seeding in needle tract. [1]

The Salivary glands may be divided into major salivary glands that include the parotid glands, submandibular and sublingual and the minor salivary glands. [2] The minor salivary glands consist of 600 to

1000 small independent glands found across the oral cavity, palatine tonsils, pharynx and larynx. [2] About 75% of the neoplasms are benign and pleomorphic adenoma is the most common histological type. [2] The smaller gland, the greater the probability for the neoplasm to be malignant. [2] 25% of the parotid tumours are malignant, while in the submandibular gland this number goes up to 43% and hits 82% in the minor salivary glands. [2]

In the parotids, the most common histological sub type is pleomorphic adenoma (53.3%); followed by warthin's tumour (28.3%) and mucoepidermoid carcinoma (9%). In the other glands pleomorphic adenoma is also the most common(36% in the submandibular & 43% in the sublingual and minor salivary glands), followed by adenoid cystic carcinoma(25% in the submandibular and 34% in the sublingual and minor salivary glands) and by the mucoepidermoid Ca(12% in the submandibular and 11% in the sublingual and minor glands. [2]

The following risk factors play a very important role in the etiologic factor for the general salivary glands neoplasms isn't well defined, but some research's statements suggest associations with Radiation, Smoking, Epstein –Barr's Virus and Genetic Factors:P53 (tumour suppressing gene) and MDM₂ (Oncogene) were identified in high percentage in the pleomorphic ex-adenomas carcinomas, high levels of (VEGF) endothelial growth factor would be bound to a large tumour size, vascular invasion, recurrence, metastasis and aggressivity. Allelic loss or translocations 12q 13-15 are associated with pleomorphic adenoma. [2] FNAC has some edge over an incisional biopsy and frozen section. [3] The present study evaluates the role of FNAC in swellings of the salivary glands.

MATERIALS & METHODS

This study was conducted in our institute from January 2011 to March 2011 over duration of three months. Out of 437 patients subjected for FNAC, 28 cases were that of salivary gland lesions. FNAC was done by using a 22G Needle fitted to a 10 ml disposable syringe. Multiple punctures were made at different sites. The smears were air dried and stained by Giemsa stain. The rest of the slides were fixed in methanol and stained by H&E procedure.

RESULTS

This study was conducted on 28 cases of salivary gland swellings. Out of which 3 cases the diagnoses were inconclusive. There were 12 (42.85%) Males and 16 Females (57.14%). Male is to Female ratio is 1:1.33 .The age ranged from 41/2 yrs to 70 yrs. The age distribution of the cases are as shown in table 1.

TABLE NO:- 1) Age wise distribution of Salivary Gland Lesions.

Age group (in years)	No. Of Cases	Percentage (%)
0-10	1	03.57
11-20	5	17.85
21-30	8	28.57
31-40	6	21.42
41-50	6	21.42
51-60	1	03.57
61-70	1	03.57
Total	28	99.97

The distribution of lesions both non neoplastic and neoplastic, in various salivary glands are shown in table. [Table 2]

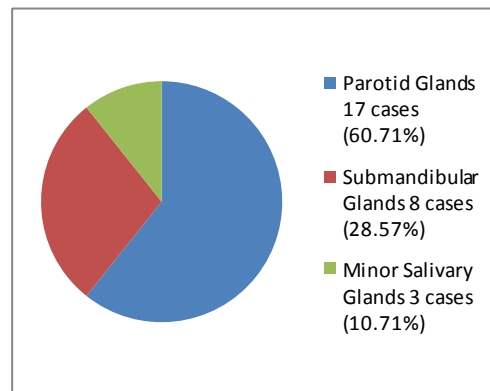


Fig. 1) Pie-chart showing the percentage of involvement of the different salivary glands.

The various lesions encountered were as in table. [Table 2]

TABLE NO. 2) Spectrum of lesions involving in the Salivary Glands.

Lesion	No.of Cases	Percentage
I. Inflammatory		
Chronic Sialadenitis	7	25.00
Granulomatous Lymphadenitis	2	07.14
II. Neoplastic		
<i>Benign</i>		
Pleomorphic Adenoma	7	25.00
Basal Cell Adenoma	1	03.57
Monomorphic Adenoma	1	03.57
<i>Malignant</i>		
Low-Grade Mucoepidermoid Carcinoma	3	10.71
Bilateral Chronic Sialadenitis of Submandibular glands	2	7.14%
Bilateral Chronic Parotitis involving	1	03.57%
Granulomatous Lymphadenitis of Parotid gland and left submandibular gland showing Chronic Sialadenitis	1	03.57%
inconclusive	3	10.71%

DISCUSSION

A Salivary gland swelling can present in a variety of locations depending on the salivary gland affected. [4] A swelling that arises in the parotid or submandibular gland usually presents as an upper neck mass. A swelling of a minor salivary gland or sublingual gland typically presents as an intra-oral swelling. [4] However, minor salivary gland tumours can sometimes occur in other areas of the upper aerodigestive tract including the nasal cavity, paranasal sinuses & larynx. [4]

Salivary Gland neoplasms are rare and they account for 2 to 6.5% of all the neoplasms of the head and neck. [4]

In our study there were 28 cases out of which 12 (42.85%) cases were Males and Females 16 cases (57.14%). These figures were similar to that of G.G Swamy et al. [6] there were 9 males (45%) and 11 (55%) female patients. Akhter J et al. [4] also quoted 18 (45%) Males and 22 (55%) female patients. The Male to Female sex ratio in our study was 1:1.33. These findings were similar to that of Imad Abdian El

Haq [7] showed 21 cases of salivary gland lesions with Male to Female ratio of 1:1.5. A study conducted by Sudarat Nguansangiam et al. [8] showed 1:1.2.

The age ranged from 41/2 yrs to 70 yrs. In a study conducted by Chetan Jain. [1] the youngest patient was 1 year old and oldest was 70 yrs old. In the similar way, the age ranged between 4-76 yrs in a study conducted by Noor ulAnn and Ashok Kumar Tanwain. [3] A study conducted by Sudarat Nguansangiam et al. [8] the age ranged from 6-100 yrs with a mean age of 53 yrs.

In our study the common age group showing the various lesions of the salivary glands was between 21-40 yrs of age. The most common benign lesion was pleomorphic adenoma; followed by 2 cases in the age group of 21-30 yrs and 1 case in the age group of 41-50 yrs; of malignant lesion (mucoepidermoid ca). This is similar to Chetna Jain [1] where the age group affected was 20-29 years among all the lesions. Pleomorphic Adenoma affected patients maximally in their thirties (30-35 yrs). In a study conducted by Fernandes et al. [9] the age ranged from 20-49 yrs. The commonest benign lesions was Pleomorphic Adenoma and malignant was mucoepidermoid carcinoma.

Among the various salivary glands involvement the parotid involved in 17 (60.71%) cases; submandibular gland 8 (28.57%) cases and minor salivary glands 3 (10.71%) cases. Our study is in comparison with Chetna Jain [1] where the most commonly affected was parotid gland (54.28%) followed by submandibular involvement (44.28%). A study conducted by Imad Abdien El Hag et al. [7] reported 16 cases from the parotid and 5 cases in the submandibular gland; in a total of 21 cases. In a study conducted by Sunil Kumar Y et al. [5] the parotid gland involvement were 74 (61.7%); Submandibular 42 (35%)

and minor salivary glands were 4(3.33%) respectively.

Among the various lesions affecting the salivary glands; Inflammatory constituted 9(32.14%)cases. The following were the inflammatory lesions Chronic Sialadenitis-7 (25%)cases, Granulomatous Lymphadenitis-2(7.14%)cases .Of the 28 cases,2 (7.14%)cases had bilateral Chronic Sialadenitis.1(3.57%) case of bilateral Chronic Parotitis. A 16 yrs Female had a dual lesion, the left parotid gland showing Granulomatous Lymphadenitis and Chronic Sialadenitis in the Left Submandibular Gland.

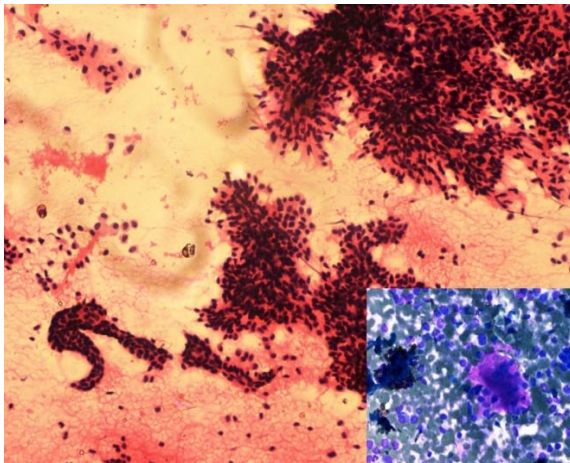


Figure: 2) Pleomorphic adenoma H & E.
Epithelial cells in single and in cohesive clusters & sheets.
Inset:- shows chondromyxoid ground substance (Giemsa Stain)

In the neoplastic category;9(32.14%) cases were benign and 3(10.71%) cases were malignant. Among the Benign lesions; Pleomorphic Adenoma (Fig1)constituted 7 cases(25%) and 1(3.57) case each of Basal Cell Adenoma (fig 2) and Monomorphic Adenoma. The Malignant lesion encountered were 3 cases (10.71%) of mucoepidermoid carcinoma (Fig 3). The ratio of benign to malignant lesions in our study was 3:1.This finding coincided with that of Chetna Jain. [1] Among the benign tumour, Pleomorphic Adenoma was the commonest tumour and among the

malignant tumours was mucoepidermoid ca, was the most common one, was also noted by Fernandes et al. [9]

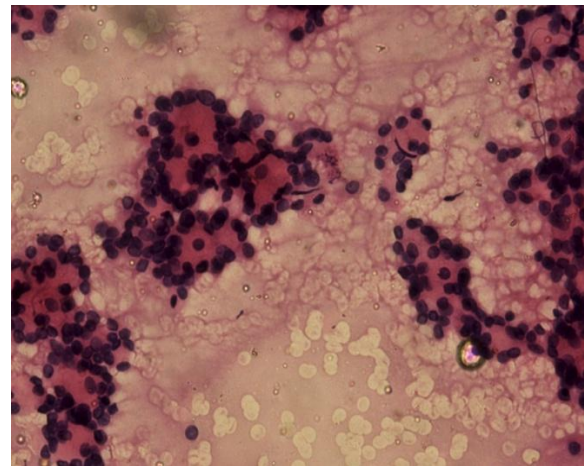


Figure: 3) Basal cell Adenoma trabecular variant-(H&E).
Many small hyaline globules of uniform size surrounded by small epithelial cells. These epithelial cells have a granular nuclear chromatic.

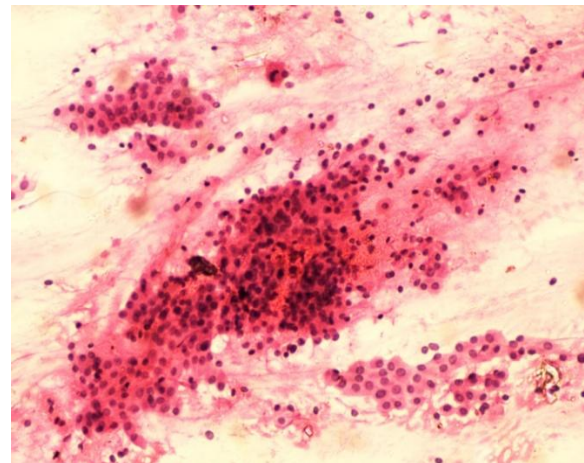


Figure: 4) Mucoepidermoid Carcinoma H & E.
Cohesive clumps and sheets of cells together with small streams of cells with in the mucus. Variation cell type - intermediate, squamous, mucin secreting- most with abundant cytoplasm

A similar study was conducted by G.G.Swamy et al. [6] showed the similar finding with 8cases(40%) inflammatory lesions;8cases (40%) were benign neoplasms and 3 cases(15%) were malignant neoplasms.

Akhter .J.et al. [4] also showed the similar findings with 16 cases (40%) inflammatory lesions,16 cases(40%) were benign neoplasms and 5 cases (12.5%) were malignant neoplasms.

CONCLUSION

FNAC plays a very important role in the diagnostic adjuvant to the clinician in the diagnosis of various tumours. It is of immense help for the diagnosis of superficial palpable tumours of salivary glands. Among the benign lesions pleomorphic adenoma and mucoepidermoid carcinoma in the malignant category are common in occurrence and create problems in diagnosis.

ACKNOWLEDGEMENT

I acknowledge Sri Karthik. B.J, Paramedical Board, Govt. of Karnataka for helping us to prepare this manuscript.

REFERENCES

1. Chetna Jain:Fine Needle Aspiration Cytology of Salivary Gland Lesions:A study of 70cases-International Journal Med Pharm Sci,March 2013/ Vol 03(07),Pg 1-10
2. Alex Itar ogawa, et al-Salivary Glands Neoplasms: Intl.Arch. Otorhinolaryngol , Sao Paulo,12, n3, p.409-418,2008
3. Noorul Aan and Ashok Kumar Tanwani:Pitfalls in Salivary Gland Fine- Needle Aspiration Cytology. International Journal of Pathology; 2009;7(2):61-65.
4. Akhter .J. etal-Role of FNAC in the diagnosis of Salivary Gland swellings-Kathmandu University Medical Journal (2008),Vol.6, No.2, Issue 22, 204-208
5. Sunil Kumar et al-Role of Fine Needle Aspiration Cytology in Salivary Gland Tumours in correlation with their Histopathology: A Two Year Prospective Study-Journal of Clinical and Diagnostic research 2011.November(Suppl-2),Vol-5(7)1375-1380
6. G.G.Swamy, et al-Accuracy of Fine Needle Aspiration Cytology in the diagnosis of palpable head and neck masses in a tertiary health care center-Journal of college of Medical Sciences-Nepal,2010,Vol-6,No-4,19-25.
7. El Hag et al-Fine Needle Aspiration Cytology of Head and Neck Masses-Seven Year's Experience in a Secondary Care Hospital-Acta cytologica Volume 47,Number 3/May- June2003
8. Sudarat Nguansangiam et al-Accuracy of Fine Needle Aspiraton Cytology of Salivary Gland Lesions:Routine Diagnostic Experince in Bangkok,Thailand-Asian Pacific Journal of Cancer Prevention,Vol .13,2012;1583-1588.
9. Fernandes H,D' Souza CRS et al-The Role of Fine Needle Aspiration Cytology in Palpable Head and Neck Masses;Journal of clinical and Diagnostic Research, 2009 Oct;(3): 1719-1725.

How to cite this article: Mallappa LB, Balakrishna SV, Raghupathi AR. A study of salivary gland lesions- by fine needle aspiration cytology. Int J Health Sci Res. 2014;4(4):44-48.
