

Study of FNAC of salivary gland lesions in a tertiary care hospital

Kacharu T. Dalve¹, Sunil Y. Swami^{2,*}, Londhe U. Rutuja³, Vikas V. Narhire⁴, Arun P. Bakshi⁵

^{1,2}Associate Professor, ³Resident, ⁴Assistant Professor, Swami Ramanand Teerth Rural Govt. Medical College, Ambajogai, ⁵Professor, Dept. of Pathology, Govt. Medical College, Nagpur

***Corresponding Author:**

Email: drsys02@gmail.com

Abstract

Introduction: Salivary gland fine-needle aspiration cytology [FNAC] represents one of the most challenging areas of cytopathology due to wide range of lesions, both reactive and neoplastic that can be encountered in the salivary glands.

Aims and Objectives: The aim of this study was to find the spectrum of salivary gland lesions in rural population, to study clinico-cytological correlation and to compare the cytomorphological features of salivary gland lesions with data available in existing literature.

Material and Methods: FNAC was performed on 92 patients with the salivary gland lesions in the rural tertiary care hospital for the period of 21 months. Slides were prepared from the aspirate, stained by Papanicolaou and May-Grunwald Giemsa [MGG] stains and the cytomorphological features of the lesions were studied. Age and sex wise distribution of the salivary gland lesions along with the cytomorphological features were charted in the table format. Further, these lesions were classified as neoplastic and non-neoplastic categories and compared with the other studies.

Result and Conclusion: Male predominance was seen in our study. Benign neoplasms were common in the age group 41-50 years with pleomorphic adenoma as commonest tumor. Malignancies were seen commonly in the age group 61-70 years with mucoepidermoid carcinoma as commonest malignancy.

Keywords: Salivary, Gland, Aspiration, Cytology.

Introduction

Salivary glands are exocrine organs responsible for the production and secretion of saliva and consist of the parotid, submandibular, sublingual, and the minor glands that are numerous and widely distributed throughout the mouth and oropharynx. Salivary glands neoplasms account for 6% of all the head and neck tumors.⁽¹⁾ FNAC is a useful method for evaluating suspicious salivary glands lesions due to its low cost, minimum morbidity, rapid turnaround time, high specificity and sensitivity.⁽²⁾ By cytological examination, lesions can be divided into inflammatory, reactive, benign, malignant and if possible, specific diagnosis is given which helps the clinicians in planning the management of the lesion.⁽³⁾ The goal of the current study was to review our FNAC experience & diagnostic accuracy in salivary gland lesions at a rural tertiary care hospital.

Material and Methods

The present study is a prospective and observational study that includes 92 patients of the salivary gland swellings referred to outpatient department [OPD] and surgical wards of a rural tertiary care hospital for a period of 21 months [Inclusion criteria]. Patients in whom, only histopathology examination [HPE] was done on salivary gland lesions were excluded from study [Exclusion

criteria]. Appropriate details regarding history, clinical examination, clinical diagnosis, radiological findings, and previous significant findings were noted down. The data was analysed in the simple statistical tables.

Prior to the procedure, physical examination of each swelling was carried out to note the size, location, relation to surrounding structures and presence of any associated enlarged lymph node. The procedures were performed using 22-24 gauge needles, with aspiration by a 10 ml disposable syringe. Prior informed consent was also taken after explaining the whole procedure, its advantages and complications. No anaesthetic medication was used during the procedure. Whenever required, help of imaging to guide the FNA was taken, especially for the swellings in deeper locations. Except mild pain, no major complications were reported like hematoma or injury to underlying nerve.

Smears were made from the aspirated contents, air dried for MGG staining and wet fixed in 95% methanol for Papanicolaou staining. Microscopic diagnosis was done primarily in the form of neoplastic or non-neoplastic. Non-neoplastic lesions were further classified as inflammatory and cystic, while neoplastic lesions were further classified as benign and malignant lesions and possible subtyping was done and compared with other studies.

Observation and Result

Table 1: Showing age wise incidence of salivary glands swelling (n=92)

| Age group [years] | Non-neoplastic lesions | | | | Neoplastic lesions/ tumors | | | |
|-------------------|------------------------|------|--------------|-----|----------------------------|------|--------------|-----|
| | Inflammatory | | Cyst | | Benign | | Malignant | |
| | No. of cases | % | No. of cases | % | No. of cases | % | No. of cases | % |
| 0-10 | 1 | 1.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11-20 | 6 | 6.5 | 0 | 0 | 6 | 6.5 | 1 | 1.1 |
| 21-30 | 4 | 4.3 | 0 | 0 | 10 | 10.9 | 0 | 0 |
| 31-40 | 4 | 4.3 | 0 | 0 | 7 | 7.6 | 0 | 0 |
| 41-50 | 2 | 2.2 | 0 | 0 | 16 | 17.4 | 0 | 0 |
| 51-60 | 6 | 6.5 | 0 | 0 | 4 | 4.3 | 1 | 1.1 |
| 61-70 | 5 | 5.4 | 1 | 1.1 | 7 | 7.6 | 6 | 6.5 |
| 71-80 | 2 | 2.2 | 1 | 1.1 | 1 | 1.1 | 0 | 0 |
| 81-90 | 0 | 0 | 0 | 0 | 1 | 1.1 | 0 | 0 |
| Total | 30 | 32.5 | 2 | 2.2 | 52 | 56.5 | 8 | 8.7 |

In the present study, age of the patients ranged from 4- 90 years. The youngest patient diagnosed as sialadenitis was 4 years old male child and oldest was 90 years old female [Fig. 1B] diagnosed as pleomorphic adenoma. The maximum number of inflammatory lesions [6 cases] were found in the age group of 11-20 years and 51-60 years.

The maximum number of benign tumours [16 cases] were observed in the age group of 41- 50 years followed by 10 cases in the age group of 21- 30 years and minimum one case each was observed in 71- 80 years and 81- 90 years age group respectively. The maximum number of malignant tumours [6 cases] were found in age group of 61-70 years and minimum one case each was found in the age group of 51- 60 years and 11- 20 years respectively.

From this study it was observed that benign tumors were common in age group below 50 years while malignant tumors were seen in the age group 50 years onwards.

There were 30 cases of inflammatory lesions, 2 cases of cysts, 52 cases of benign tumor and 8 cases of malignant tumors.

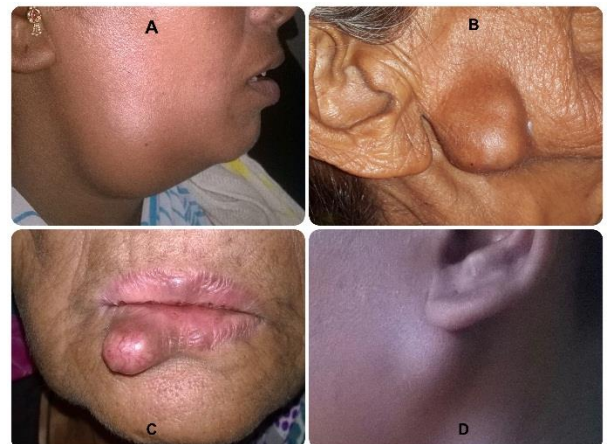


Fig. 1

Table 2: Showing sex wise incidence of salivary gland swellings (n = 92)

| Sex | Non-neoplastic lesions | | | | Neoplastic lesions/ tumors | | | | Total |
|--------|------------------------|------|--------------|-----|----------------------------|------|--------------|-----|-------------|
| | Inflammatory | | Cyst | | Benign | | Malignant | | |
| | No. of cases | % | No. of cases | % | No. of cases | % | No. of cases | % | No (%) |
| Male | 17 | 18.5 | 1 | 1.1 | 28 | 30.4 | 7 | 7.6 | 53 (57.6 %) |
| Female | 13 | 14.1 | 1 | 1.1 | 24 | 26.1 | 1 | 1.1 | 39 (42.4 %) |
| Total | 30 | 32.6 | 2 | 2.2 | 52 | 56.5 | 8 | 8.7 | 92 (100 %) |

Out of 92 cases of salivary gland lesions in the present study, 53 were males and 39 were females with male to female ratio of 1.4:1. The inflammatory lesions were seen in 17 males and 13 females. One case each of a cyst was found in male and female respectively. The male to female ratio for inflammatory lesions was 1.3:1. Benign tumours were observed in 28 males and in 24 females with a male to female ratio of 1.2:1. Malignant tumors were observed in 7 males while only one lesion in female was suspicious for malignant.

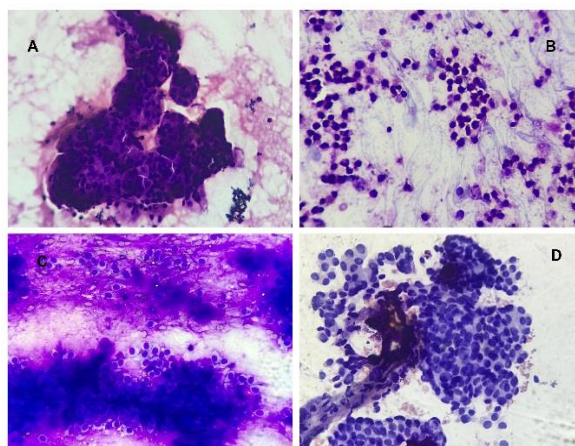
Table 3: Showing site wise incidence of salivary gland swellings (n= 92)

| Cytodiagnosis | Parotid Gland | Sub-mandibular gland | Sub-lingual gland | Minor salivary glands | Total | |
|--|---------------|----------------------|-------------------|-----------------------|--------------|------|
| | No. of cases | No. of cases | No. of cases | No. of cases | No. of cases | % |
| Sialoadenosis. [Fig. 2A] | 1 | 1 | 0 | 0 | 2 | 2.2 |
| Acute sialadenitis. [Fig. 2B] | 7 | 11 | 1 | 1 | 20 | 21.7 |
| Chronic Sialadenitis. | 3 | 5 | 0 | 0 | 8 | 8.7 |
| Retention Cyst [Fig. 1A] | 2 | 0 | 0 | 0 | 2 | 2.2 |
| Pleomorphic Adenoma. [Fig. 1B, 1C, 2C, 2D] | 32 | 11 | 0 | 2 | 45 | 48.9 |
| Monomorphic Adenoma. | 1 | 1 | 0 | 0 | 2 | 2.2 |
| Oncocytoma [Fig. 3A] | 1 | 0 | 0 | 0 | 1 | 1.1 |
| Adenolymphoma | 3 | 0 | 0 | 0 | 3 | 3.3 |
| Suspicious of malignancy. | 1 | 0 | 0 | 0 | 1 | 1.1 |
| Mucoepidermoid Carcinoma.[Fig. 1D] | 3 | 2 | 0 | 0 | 5 | 5.4 |
| Acinic cell Carcinoma [Fig. 3C] | 1 | 0 | 0 | 0 | 1 | 1.1 |
| Adenoid cystic Carcinoma [3B] | 1 | 0 | 0 | 0 | 1 | 1.1 |
| Metastasis [Fig. 3D] | 1 | 0 | 0 | 0 | 1 | 1.1 |
| Total | 57 | 31 | 1 | 3 | 92 | 100 |

Out of 92 cases in our study, majority of salivary gland lesions [45 cases] constituted pleomorphic adenoma [48.9%], followed by 20 cases of acute sialadenitis [21.7%], 8 cases of chronic sialadenitis [8.7%] and 5 cases of mucoepidermoid carcinoma [5.4%].

Discussion

The majority of series evaluating usefulness of salivary gland FNAC are based on a mixture of pathologies including benign neoplasms, malignancies, and inflammatory lesions. Although the salivary gland tumours account for less than 3% of all head and neck tumours, the superficial location, easy accessibility and high diagnostic accuracy make FNA a popular method for evaluating salivary gland tumours.⁽⁴⁾

**Fig. 2**

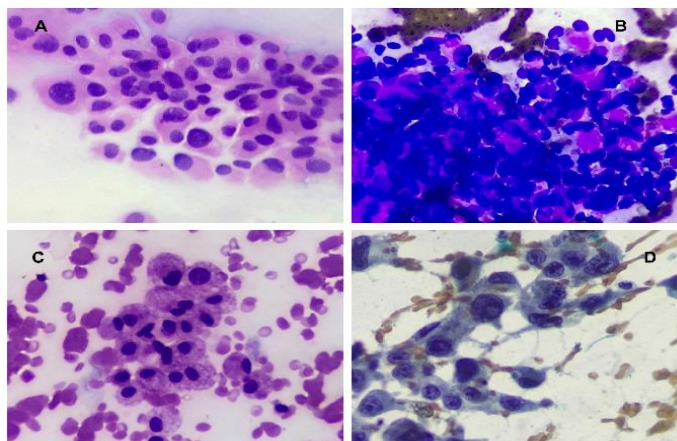


Fig. 3

Table 4: Comparative study of site wise distribution of salivary gland lesions

| Authors | Total cases | Parotid gland No.(%) | Sub-mandibular gland No.(%) | Sub-lingual gland No.(%) | Minor salivary glands No. (%) |
|-----------------------|-------------|----------------------|-----------------------------|--------------------------|-------------------------------|
| Frable & Frable.1979. | 99 | 62 [62.6 %] | 36[36.3%] | 1[1.1%] | -- |
| Shaha et al.1990. | 160 | 84 [52.5%] | 70[43.8%] | - | 6[3.8%] |
| Bhatia.1993. | 98 | 61 [62.2%] | 30[30.66%] | - | 7[7.1%] |
| Anita et al; 2014 | 124 | 60 [48.4%] | 51[41.2%] | - | 13[10.4%] [10.4%] |
| Present study. 2016 | 92 | 57 [61.9%] | 31[33.69%] | 1[1.1%] | 3[3.3%] |

In our study, among all the salivary gland lesions, parotid gland is most commonly involved [61.9%] which is comparable with the study of Bhatia,⁽⁵⁾ Frable & Frable⁽²⁾ and others.

Table 5: Comparative study of neoplastic lesions of salivary gland lesions by FNAC

| Authors | Total cases | Pleomorphic Adenoma | Mucoepidermoid Carcinoma |
|-----------------------|-------------|---------------------|--------------------------|
| Canan Ersöz: 2004. | 108 | 46 [42.6%] | 9 [8.3] |
| Arul P. et al.: 2015. | 146 | 62 [42.5%] | 9 [6.2] |
| Present Study: 2016. | 92 | 45 [48.9%] | 5 [5.5%] |

In the present study, pleomorphic adenoma is the commonest benign tumor and mucoepidermoid carcinoma is the commonest malignant salivary gland tumor. These findings are consistent with studies done by Canon Ersoz et al.⁽⁶⁾ and Arul P et al.⁽⁷⁾

Age wise distribution of salivary gland lesions: In the present series, the age of the patients ranged from 4 to 90

years. The youngest patient is 4 years old and an oldest patient is 90 years old. Findings in our series are comparable with the study of Bhatia et al.⁽⁵⁾

The maximum number of benign tumor 16 [17.4%] in our study were found in the age group of 41-50 years and maximum number of malignant tumor cases 6 [6.5%] were found in the age group of 61-70 years, which are comparable to the study of Anita O et al.⁽¹⁾

Sex wise distribution of salivary gland lesions: In present study, male: female ratio in all salivary gland neoplasm is 1.35:1 suggesting of male preponderance. These finding are consistent with studies done by Anita O et al,⁽¹⁾ Shaha et al,⁽⁸⁾ Das DK et al,⁽⁹⁾ Erik G et al⁽¹⁰⁾ and which shows Male: Female ratio of 3.7:1, 1.17:1, 1.28: 1 and 1.18: 1 and respectively with male preponderance.

Conclusion

There is a definite male predominance in lesions of salivary glands.

Parotid is the most common site for occurrence of salivary gland lesions.

Benign neoplasms are most common in the age group 41-50 years and malignancies in the age group 61-70 years. Pleomorphic adenoma is the most common

benign neoplastic lesion while mucoepidermoid carcinoma is the most common malignancy found in our study. Thus the findings in our present study as regards to the age, sex and site wise variations are comparable to the data in the existing literature. This study presents the institutional experience of dealing with diverse spectrum of salivary gland lesions.

References

1. Anita Omhare, Sanjeev Kumar Singh, Jitendra Singh Nigam and Ankit Sharma. Cytohistopathological Study of Salivary Gland Lesions in Bundelkhand Region, Uttar Pradesh, India. In: Pathology Research International Volume 2014 (2014), Article ID 804265, 5 pages. <http://dx.doi.org/10.1155/2014/804265>.
2. M. A. S. Frable and W. J. Frable. Fine-needle aspiration biopsy of salivary glands. *Laryngoscope* 1991;101:245-49.
3. M. W. Stanley, R. H. Bardales, C. E. Farmer et al. Primary and metastatic high-grade carcinomas of the salivary glands: a cytologic-histologic correlation study of twenty cases. *Diagnostic Cytopathology* 1995;13:37-43.
4. Miteshkumar B. S, Rasik N. H, Reena B. D, Sonal L. I, Kumarbhargav R. K, Zarna D. Fine Needle Aspiration Cytology: Accurate and Reliable Tool for Primary Diagnosis of Salivary Gland Lesions. *NJIRM* 2014; 5:11-17.
5. Bhatia A. FNAC in the diagnosis of mass lesions of the salivary gland. *Indian J Cancer* 1993;30:26-30.
6. Canan Ersöz, Aysun H. Uguz, Ülkü Tuncer, Levent Soyulu, Mete Kiroglu. Fine needle aspiration cytology of the salivary glands: a twelve years' experience. *APJ* 2004; 1:51-6.
7. Arul. P, Akshatha C, Suresh Masilamani, Srivani Jonathan. Diagnosis of Salivary Gland Lesions by Fine Needle Aspiration Cytology and its Histopathological Correlation in A Tertiary Care Centre of Southern India. *Journal of Clinical and Diagnostic Research* 2015; 9:7-10.
8. Shaha AR, Webber C, DiMaio T, Jaffe BM. Needle aspiration biopsy in salivary gland lesions. *Am J Surg* 1990;160:373-6.
9. Das DK, Petkar MA, Al-Mane NM, Sheikh ZA, Mallik MK, Anim JT. Role of fine needle aspiration cytology in the diagnosis of swellings in the salivary gland regions: a study of 712 cases. *Med Princ Pract* 2004;13:95-106.
10. Erik G. Cohen, Snehal G. Patel, Oscar Lin, Jay O. Boyle, Dennis H. Kraus. Fine-Needle Aspiration Biopsy of Salivary Gland Lesions in a Selected Patient Population. *Arch Otolaryngol Head Neck Surg* 2004;130:773-78.