

Diagnostic Accuracy of Fine Needle Aspiration Cytology in Salivary Gland Lesions: A Teaching Hospital Based Study

Priyanka Singh¹, Shubhranshu Shekhar¹

¹Assistant Professor, Department of Pathology, Narayan Medical College and Hospital, Sasaram, Jamuhar, Bihar.

Abstract

Background: Fine needle aspiration cytology (FNAC) salivary gland (SG) is accurate, simple, rapid, inexpensive, well tolerated and harmless for the patient. Fine needle aspiration (FNA) cytology of the SG is an accepted, sensitive and specific technique in the diagnosis of both neoplastic and non-neoplastic lesions. **Subjects and Methods:** This retrospective study was conducted in the pathology department and (56) fifty six cases of salivary gland lesions, attending the outpatient and inpatient wards of surgery and ENT department of a tertiary care hospital were included in the study. The cases were thoroughly interrogated, clinically examined and relevant investigations done. FNAC procedure was explained to the patient and patient was placed in a comfortable position. **Results:** Maximum number of cases was observed in age group 25-34 years and there were 34(60.7%) male and 22(39.3%) female cases in this study. Commonest gland involved was parotid (71.4%, 40/56), followed by submandibular gland (25.0%, 14/56) and minor salivary glands (1.7%, 1/56) whereas no case of sublingual salivary gland lesion was observed in the present study. **Conclusion:** FNAC of the salivary gland is a safe and reliable technique in the primary diagnosis of salivary gland lesions. Although, limitations are encountered while predicting specific lesions on cytology, especially when dealing with cystic and some malignant lesions.

Keywords: Salivary gland, Diagnosis and FNA Cytology.

Corresponding Author: Dr. Shubhranshu Shekhar, Assistant Professor, Department of Pathology, Narayan Medical College and Hospital, Sasaram, Jamuhar, Bihar-821305.

Received: January 2018

Accepted: March 2018

Introduction

The salivary gland (SG) system is composed of major SGs (parotid, submandibular, and sublingual glands) and the minor SGs which are found throughout the submucosa of the oral mucosa and as numerous small glandular tissues. Related to the histologic complexity of SGs, their lesions present with a great variety of morphologic features.^[1] Fine needle aspiration cytology (FNAC) is accurate, simple, rapid, inexpensive, well tolerated and harmless for the patient.^[2] Fine needle aspiration (FNA) cytology of the SG is an accepted, sensitive and specific technique in the diagnosis of both neoplastic and non-neoplastic lesions.^[3] It is a relatively painless and safe procedure for a rapid and current diagnosis. Many clinicians believe that FNA as a reliable and useful technique for the management of their patients with SG masses.^[4-9] Since FNA of the SGs can distinguish inflammatory lesions from neoplastic conditions, lymphomas from epithelial malignancies and primary tumors from metastatic tumors, FNA provides information for planning the operation.^[10] The aim of this study was to evaluate the salivary gland lesions in my setting and to assess the diagnostic accuracy of FNAC for salivary gland lesions.

Subjects and Methods

This retrospective study was conducted in the pathology department of Narayan Medical College and Hospital, Sasaram, Jamuhar, Bihar, India. After obtaining Institutional Ethical approval, we conducted a prospective study in the Department of Pathology, Narayan Medical College and Hospital, during the period from January 2017 to November 2017, which comprised of (56) fifty six cases of salivary gland lesions, attending the outpatient and inpatient wards of surgery and ENT department of a tertiary care hospital were included in the study. The cases were thoroughly interrogated, clinically examined and relevant investigations done. FNAC procedure was explained to the patient and patient was placed in a comfortable position. They were then subjected to fine needle aspiration cytology. Aspirations were carried out with 21 or 22 gauge needles of varying lengths with 10 ml syringes in a syringe holder after careful clinical examination of the lesion. The samples were placed on a glass slide and smears were made by inverting second glass slide over the drop and as it spreads, pulling the slides apart horizontally or vertically. Smears were stained by using MGG and Papanicolaou stain. Cytologic diagnosis was compared with histopathologic diagnosis wherever it was available.

Results & Discussion

A total of 56 fifty six cases of salivary gland lesions FNAC were done in the pathology department of Narayan Medical College and Hospital, Sasaram. [Figure 1] shows the maximum number of cases was observed in age group 25-34 years and there were 34(60.7%) male and 22(39.3%) female cases in this study. Commonest gland involved was parotid (71.4%, 40/56), followed by submandibular gland (25.0%, 14/56) and minor salivary glands (1.7%, 1/56) whereas no case of sublingual salivary gland lesion was observed in the present study. In the present study, [Table 1] shows the non-neoplastic lesions accounted for 23.2% (13/56), followed by 67.8% (38/56) benign tumours and 8.9% (5/56) malignant tumours.

Table 1: Distribution of salivary gland lesions

Cytological Diagnosis		Cases (%)
Neoplastic	Benign	38(67.8%)
	Malignant	05(8.9%)
Non neoplastic		13(23.2%)

Table 2: Frequency distribution of non-neoplastic and neoplastic lesions

Cytological diagnosis		Cases (%)
Non-neoplastic (13)	Chronic sialadenitis	7(12.5%)
	Cystic lesions	3(5.3%)
	Acute on chronic sialadenitis	2(3.6%)
	Chronic granulomatous inflammation	1(1.7%)
Neoplastic Benign(38)	Pleomorphic adenoma	35(62.5%)
	Warthin’s tumour	3(5.3%)
Neoplastic Malignant(05)	Mucoepidermoid carcinoma	2(3.6%)
	Acinic cell carcinoma	1(1.8%)
	Adenoid cystic carcinoma	1(1.8%)
	Carcinoma ex pleomorphic adenoma	1(1.8%)

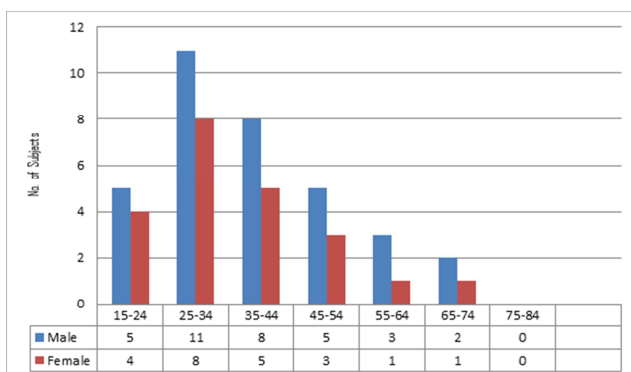


Figure 1: Age and Sex Distribution of Subjects

Chronic sialadenitis was the most common non-neoplastic lesion (12.5%) followed by cystic lesions (5.3%), acute on chronic sialadenitis (3.6%) and chronic granulomatous inflammation (1.7%). Pleomorphic adenoma (62.5%) was the most common benign neoplasm. Warthin’s tumour accounted for (5.3%). Mucoepidermoid carcinoma was the

most common malignant lesion (3.6%) followed by acinic cell carcinoma (1.8%), carcinoma-ex pleomorphic adenoma (1.8%) and adenoid cystic carcinoma (1.8%) [Table 2]. In the present study, benign neoplasms accounted for 38 cases (67.8%). The rate of benign neoplasm was lower than other reports which ranged from 49 to 83%.^[11-14] We observed the pleomorphic adenoma as the commonest benign neoplasm similar to those previously reported number of studies.^[11,15-17] Various authors have reported that the incidence of malignant tumours ranged from 15% to 32%, and in the present study it accounted for 8.9% similar to Nguansangiam et al, which have found a lower rate of malignant neoplasms.^[11,15,16] In our study, the most common malignant salivary gland tumor was mucoepidermoid carcinoma which accounted for 3.6% of all malignant neoplasms followed by acinic cell carcinoma and malignant mixed tumours. In contrast, Nguansangiam et al. have found that lymphoma is the commonest primary malignant salivary gland tumor followed by mucoepidermoid carcinoma.^[11] Parotid gland was observed as the commonest site of salivary gland lesions; (71.4%, 40/56) of all salivary gland lesions involved the parotid gland in this series. Almost similar distribution of salivary gland neoplasms in the parotid gland has also been described by Choudhury et al.^[18] A review of literature revealed a wide variation in the sensitivity and specificity of FNAC for salivary gland swelling in different populations and setups.^[19-21] The diagnostic sensitivity varied between 81% and 100%, specificity was 94-100% and the accuracy of tumour typing was 61-80%.^[22] Klijanienko et al found a sensitivity of 94%, specificity of 97% and accuracy of 95%.^[23] We found an overall diagnostic accuracy of FNAC to be 94.3%. Pleomorphic adenoma is a biphasic neoplasm and no two pleomorphic adenomas look alike. Epithelial metaplasia, mainly squamous and oncocytic, and significant cytologic atypia may at times be worrisome. Aspiration of mucoid paucicellular fluid or lack of stromal component may lead to a false positive diagnosis especially that of low grade mucoepidermoid carcinoma. Adenoid cystic carcinoma is a close differential of pleomorphic adenoma. This differentiation is very important as the surgical management is different. Adenoid cystic carcinoma shows basement membrane like material which may be misinterpreted as stromal component. Attention to nuclear morphology helps in distinguishing these two entities. One case initially diagnosed as Warthin’s tumour was found to be low grade acinic cell carcinoma on histopathology. Interstitial infiltration of lymphoid cells is a prominent feature in some acinic cell carcinomas and cause confusion with Warthin’s tumour.^[24]

Diagnostic problems in FNA cytology of salivary glands are discussed by various authors, based on a very large series of cases. Their vast experience proves utility of FNAC in salivary glands beyond doubt. It is further stated that if

established diagnostic criteria are present and are strictly observed, a high level of accuracy can be achieved. The most important questions to be answered by this study is

whether results gained from FNAC can be useful in the clinical management of patient with salivary gland lesions. My experience has demonstrated a variety of circumstances in which such data may be valuable. The usual recommendation for the neoplastic lesions regardless of the preoperative cytological diagnosis is excision but recognition of benign lesion, beforehand like in case of Warthin's tumor, in poor risk patients may be of benefit in avoiding inappropriate surgery.

Conclusion

These findings suggest that, the FNAC of the salivary gland is a safe and reliable technique in the primary diagnosis of salivary gland lesions. Although, limitations are encountered while predicting specific lesions on cytology, especially when dealing with cystic and some malignant lesions. Lastly every clinician who uses FNAC must be aware of the limitations of the method. This office based procedure is reliable, well tolerated, easy to perform and cost effective. Moreover preoperative differentiation of tumors may help prepare both the surgeon and patient for an appropriate surgical procedure.

References

1. Schindler S, Nayar R, Dutra J, Bedrossian CWM. Diagnostic challenges in aspiration cytology of the salivary glands. *Semin Diagn Pathol* 2001; 18: 124-146.
2. Fernandes GC, Pandit AA. Diagnosis of salivary gland tumours by FNAC. *Bombay Hospital Journal* 2000; 42:108-11.
3. Cajulis RS, Gokaslan ST, Yu GH, Frias-Hidvegi D. Fine needle aspiration biopsy of the salivary glands, a five year experience with emphasis on diagnostic pitfalls. *Acta Cytol* 1997; 41: 1412- 1420.
4. Shintani S, Matsuura H, Hasegawa Y. Fine needle aspiration of salivary gland tumors *Int J Oral Maxillofac Surg* 1997; 26: 284-286.
5. Wong DS, Li GK. The role of fine needle aspiration cytology in the management of parotid tumors: a critical clinical appraisal *Head Neck* 2000; 22: 469-473.
6. Chhieng DC, Cangiarella JF, Cohen JM. Fine needle aspiration cytology of lymphoproliferative lesions involving the major salivary glands. *Am J Clin Pathol* 2000; 113: 563-571.
7. Jayaram G, Verma AK, Sood N, Khurana N. Fine needle aspiration cytology of salivary gland lesions. *J Oral Pathol Med* 1994; 23: 256-261.
8. Mukunyadzi P, Bardales RH, Palmer HE, Stanley MW. Tissue effects of salivary gland fine needle aspiration. *Am J Clin Pathol* 2000; 114: 741-745.
9. Ersöz C, Soylu L, Cosar EF, Özshahinoglu C. Diagnostic value of fine needle aspiration cytology in pleomorphic adenoma of the salivary gland (Turkish). *Türk Otolarengoloji Arsivi* 1993; 31: 188-191.
10. Zakowski MF. Fine needle aspiration cytology of tumors: Diagnostic accuracy and potential pitfalls. *Cancer Invest* 1994; 12: 505-515.
11. Nguansangiam S, Jesdapatarakul S, Dhanarak N, Sosrisakorn K. Accuracy of fine needle aspiration cytology of salivary gland lesions: routine diagnostic experience in Bangkok, Thailand. *Asian Pacific Journal of Cancer Prevention*. 2012;13(4):1583-8.
12. Tan LG, Khoo ML. Accuracy of fine needle aspiration cytology and frozen section histopathology for lesions of the major salivary glands. *Annals of the Academy of Medicine Singapore*. 2006;35(4):242-8.
13. Mihashi H, Kawahara A, Kage M. Comparison of preoperative fine-needle aspiration cytology diagnosis and histopathological diagnosis of salivary gland tumors. *Kurume Medical Journal*. 2006;53(1-2):23-27.
14. Jan IS, Chung P, Weng M. Analysis of fine-needle aspiration cytology of the salivary gland. *Journal of the Formosan Medical Association*. 2008;107(5):364-70.
15. Cajulis RS, Gokaslan ST, Yu GH, Frias-Hidvegi D. Fine needle aspiration biopsy of the salivary glands: a five year experience with emphasis on diagnostic pitfalls. *Acta Cytologica*. 1997; 41(5):1412-20.
16. Boccato P, Altavilla G, Blandamura S. Fine needle aspiration biopsy of salivary gland lesions: a reappraisal of pitfalls and problems. *Acta Cytologica*. 1998;42(4):888-98.
17. 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. *Medical Principles and Practice*. 2004;13(2):95-106.
18. Choudhury AA, Sultana T, Siddique BH, Amin ASA. Diagnosis of parotid gland mass by the fine needle aspiration cytology (FNAC) and its histopathological correlation-2 years study in BSMMU, Dhaka. *Bangabandhu Sheikh Mujib Medical University Journal*. 2011;4(2):65-9.
19. Murai N, Taniguchi Z, Takahashi Y, Kuboshima F, Tateya I. A study of salivary gland aspiration cytology reporting: guideline validity. *Nihon Jibiinkoka Gakkai Kaiho*. 2011;114(7):615-9.
20. Piccioni LO, Fabiano B, Gemma M, Sarandria D, Bussi M. Fine needle aspiration cytology in the diagnosis of parotid lesions. *Acta Otorhinolaryngol Ital*. 2011;31(1):1-4.
21. Singh A, Haritwal A, Murali B. Correlation between cytology and histopathology of the salivary gland. *Australas Med J*. 2011;4(2):66-71.
22. Young JA. Diagnostic problems in fine needle aspiration cytopathology of the salivary glands. *J Clin Pathol*. 1994;47:193-8.
23. Klijanienko J, Vielh P, Batsakis JD. *Monographs in clinical cytology*. Vol. 15. Salivary gland tumours. Basel, Switzerland: Karger. 2000.
24. Orell SR, Sterrett GF, Whitaker D. *Fine Needle Aspiration Cytology*. 4/e. 2005;17(4):41-82.

Copyright: © the author(s), publisher. Asian Journal of Medical Research is an Official Publication of "Society for Health Care & Research Development". It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Singh P, Shekhar S. Diagnostic Accuracy of Fine Needle Aspiration Cytology in Salivary Gland Lesions: A Teaching Hospital Based Study. *Asian J. Med. Res.* 2018;7(2):PT01-PT03. DOI: dx.doi.org/10.21276/ajmr.2018.7.2.PT1

Source of Support: Nil, **Conflict of Interest:** None declared.