



ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN CASES OF SALIVARY GLAND LESIONS

Pathology

Dr. Rachana* PG Student, MD Pathology, Department of Pathology, Darbhanga medical college, Darbhanga *Corresponding Author

Dr. G. L. Das Associate Professor, Department of Pathology, Darbhanga medical college, Darbhanga

Dr. Prof. Ajit Kumar Chaudhary HOD, Department of Pathology, Darbhanga medical college, Darbhanga

ABSTRACT

Introduction: Salivary gland lesions are common lesions of the head and neck region. Fine needle aspiration cytology (FNAC) of salivary gland tumors is accurate, simple, rapid, inexpensive, and harmless to the patient and also well compared with biopsy. **Objectives:** (i). To study the incidence, and age vs. sex wise distribution of salivary gland lesions. (ii) To study cytological features of major salivary gland lesions and categorize them into benign and malignant neoplasm on FNAC and their comparison on biopsy. **Materials and Methods:** As a part of study 90 cases of different age groups were selected from Nov 2013 to Nov 2015 at Darbhanga Medical College and Hospital, Darbhanga. Fine needle aspiration was done at the Department of Pathology after thorough clinical examination. Relevant histories were taken. FNAC smears were made and few slides were immediately fixed in 95% alcohol for PAP staining and few were air dried for MGG (May-Grunwald Giemsa) staining. **Results:** By FNAC, out of 90 cases, approximately 61% cases were non-neoplastic among which 85.5% cases were of sialadenitis. Among neoplastic lesion 77.14% cases were benign and 22.86% cases were malignant. Commonest benign and malignant tumors were pleomorphic adenoma and mucoepidermoid carcinoma, respectively. Biopsy was done on 20 cases of neoplastic tumor. The diagnostic accuracy of FNAC in salivary gland tumor are as follows- sensitivity-75%, specificity-93.75%, positive predictive value-75%, negative predictive value-93.75% and accuracy was 90%. **Conclusion:** FNAC is an useful diagnostic procedure because of its immediate result, high diagnostic accuracy (90% in the present study) and lack of complications.

KEYWORDS

Fine needle aspiration cytology, salivary gland tumors, biopsy

INTRODUCTION

Salivary gland tumors are account for 2-6.5% of all head and neck tumors[1]. 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]. Moreover, it is usually difficult in initial phases to differentiate a benign tumor from malignant one on the clinical basis. Due to superficial location and easy access to the salivary glands FNAC is a popular method for evaluating salivary gland tumors.

Between 65-80% of all primary epithelial tumors occur in parotid gland, 10% in submandibular and remainder in the minor salivary glands, including the sublingual glands. Approximately 15% to 30% of tumors in the parotid glands are malignant. In contrast, approximately 40% of submandibular, 50% of minor salivary gland, and 70-90% of sublingual tumors are cancerous.

OBJECTIVES:

(i). To study the incidence, and age vs. sex wise distribution of salivary gland lesions. (ii) To study cytological features of major salivary gland lesions and categorize them into benign and malignant neoplasm on FNAC and their comparison on biopsy.

MATERIAL AND METHODS

The present study comprises of FNAC of 90 cases of salivary gland lesions encountered in Darbhanga Medical College and Hospital, Darbhanga during 24 months period (November 2013 to November 2015). Relevant history was taken and clinical examination was done for every patient. The patients were informed about the procedure and consents were obtained from the patients for the procedure. For pap and H & E (Haematoxylin and Eosin) staining, the slides were immediately fixed in Carnoy's fixative/95% ethanol and the rest of the slides were air dried for MGG staining. Among 90 FNAC cases, 20 patients had histopathological follow up. Sensitivity, Specificity and Diagnostic Accuracy were calculated with the help of the statistical data.

RESULTS

Ninety cases of salivary gland lesions were included in this study. There were 46 male patients and 44 female patients. Majority of cases were in 31-40 years age group.

Fifty-two (57.78%), 30(33.33%), 2(2.22%) and 6(6.67%) cases

occurred in parotid gland, submandibular gland, sublingual gland and minor salivary glands respectively.

There were 55(61.11%) cases of non-neoplastic lesions and 35 (38.89%) cases of neoplastic lesions. Out of 55 cases of non-neoplastic lesions, 47(85.45%) cases were sialadenitis, 3(5.45%) cases were benign lymphoepithelial cysts, 4(7.27%) cases were mucocele and 1(1.82%) case was benign lymphoepithelial lesion.

There were 27(77.14%) cases of benign tumors and 8(22.86%) cases of malignant tumors. Benign tumors were common in the younger age groups (3rd decade) and malignant tumors were common in the older age groups (6th decade). There were 17 male patients (48.57%) and 18 female patients (51.42%) out of 35 cases of salivary gland tumors.

Among the benign salivary gland tumors, pleomorphic adenoma was the commonest accounting for 60% of all tumors and 77.77% of all benign tumors. Other benign tumors were 11.1% each of Warthin's tumor and basal cell adenoma.

Among the malignant tumors, Mucoepidermoid carcinoma(MEC) was the commonest involving 3 cases. Other malignant tumors were adenoid cystic (2 cases), adenocarcinoma (1 case), acinic cell carcinoma (1 case) and pleomorphic low grade adenocarcinoma (1 case). Histopathological correlation was available for 20 out of 90 cases. On biopsy, one case of pleomorphic adenoma was turned out to be Carcinoma ex pleomorphic adenoma and 1 case of Acinic cell carcinoma was turned out as Warthin's tumor. Statistical analysis revealed Sensitivity- 75%, Specificity- 93.75%, Positive predictive value- 75%, Negative predictive value- 93.75% and Diagnostic Accuracy- 90% in the diagnosis of salivary gland tumors by FNAC.

Table1- Cytological type of non- neoplastic lesions of salivary glands and their sites

FNAC diagnosis	Parotid No. (%)	Submandibular No. (%)	Sublingual No. (%)	Minor salivary glands No. (%)	Total
Acute - Sialadenitis	8 (14.54%)	5 (9.1%)	0	0	13(23.64%)
Chronic sialadenitis	13 (23.64%)	20 (36.36%)	0	1 (1.82%)	34 (61.82%)

All sialadenitis	21 (38.18%)	25 (45.46%)	0	1 (1.82%)	47 (85.45%)
Mucocele	0	0	2 (3.64%)	2 (3.64%)	4 (7.27%)
Benign lymphoepithelial cyst	3 (5.45%)	0	0	0	3 (5.45%)
Benign lymphoepithelial lesion	1 (1.82%)	0	0	0	1 (1.82%)

Table 2- cytological type and site of salivary gland tumors (neoplastic lesions)

Cytological type	Total No.	Parotid No. (%)	Submandibular No. (%)	Minor No. (%)
Benign (27 cases)				
Pleomorphic adenoma	21 (77.78%)	18 (66.67%)	2 (7.41%)	1 (3.7%)
Basal cell adenoma	3 (11.11%)	2 (7.41%)	1 (3.7%)	0
Warthin's tumor	3 (11.11%)	3 (11.11%)	0	0
Total benign	27	23	3	1
Malignant (8 cases)				
Mucoepidermoid carcinoma	3 (37.8%)	2 (25%)	1 (12.5%)	0
Adenoid cystic carcinoma	2 (25%)	1 (12.5%)	0	1 (12.5%)
Adenocarcinoma	1 (12.5%)	0	1 (12.5%)	0
Acinic cell carcinoma	1 (12.5%)	1 (12.5%)	0	0
Pleomorphic low grade adenocarcinoma	1 (12.5%)	0	0	1 (12.5%)
Total malignant	8	4	2	2
Total neoplastic lesions (benign + malignant)	35	27	5	3

Table 3- comparison of FNAC with histopathological study

Serial no.	Cytological diagnosis (FNAC)	Histopathological Diagnosis (Biopsy)							Total
		Pleomorphic adenoma	Basal cell adenoma	Warthin's tumor	Mucoepidermoid carcinoma	Adenoid cystic carcinoma	Acinic cell carcinoma	Carcinoma ex pleomorphic adenoma	
1.	Pleomorphic adenoma	11	-	-	-	-	-	1	12
2.	Basal cell adenoma	-	1	-	-	-	-	-	1
3.	Warthin's tumor	-	-	3	-	-	-	-	3
4.	Mucoepidermoid carcinoma	-	-	-	2	-	-	-	2
5.	Adenoid cystic carcinoma	-	-	-	-	1	-	-	1

6.	Acinic cell carcinoma	-	-	1	-	-	-	-	1
Total		11	1	4	2	1	-	1	20

DISCUSSION

Most of the cases presented with a palpable swelling in salivary gland regions. Very few cases presented with pain.

Maximum number of salivary gland lesion was seen in the 4th decade, accounting for 23.33% of cases. Das DK et al[3] also had maximum number of cases in 4th decade.

In our study most of the lesions involved parotid gland (57.78%). Predominance of parotid gland lesion was also confirmed by Ronald NJ et al (58.7%) [4] & Fereshteh Ameli et al (76.2%) [2].

In our study, 61.11% cases were non-neoplastic and 38.89% cases were neoplastic. This finding is in contrast to most of studies where neoplastic lesion were more common than non-neoplastic lesions e.g. Fereshteh Ameli et al [2] & Jayaram G et al [5] had found neoplastic lesions in 77.2% and 72.47% cases respectively.

In our study, total 35 neoplastic cases of salivary gland was seen out of which 27 cases (77.12%) were benign tumors and 8 cases (22.86%) were malignant tumors.

In study conducted by Fereshteh Ameli et al [2], out of the 78 neoplastic lesions, 61 (78.3%) were reported as benign and 13 (16.7%) as malignant on FNAC. Khandekar M.M. et al [1] showed that out of the 56 neoplastic lesions, 34 (60.7%) were benign and 22 (39.3%) were malignant.

In our study, parotid gland was most commonly affected by salivary gland tumors i.e. 77.14% (27 cases out of 35 cases), followed by submandibular glands (14.29%). Three cases of tumors were seen in minor salivary gland. The most common site for benign as well as malignant tumor was parotid gland accounting for 65.71% & 11.43% of all cases, respectively. Fereshteh Ameli et al [2] reported 80.8% of salivary gland tumors involved parotid (63 out of 78 cases) out of which 66.67% were benign and 11.54% were malignant tumors.

In our study, Pleomorphic adenoma was the commonest benign tumor of salivary glands i.e. 77.78% (21 out of 27 cases) which most commonly occurred in parotid gland. Warthin's tumor accounted for 11.11% (3 cases) of benign tumors and all of them occurred in parotid gland. Basal cell adenoma occurred in 3 cases (11.11%). Khandekar M.M. et al [1] showed 96.55% cases of benign tumors to be pleomorphic adenoma (28 out of 29). Fereshteh Ameli et al [2] showed, among the 61 benign neoplasms, pleomorphic adenoma (PA) was the most common lesion (43 out of 61 cases; 70.5%) followed by Warthin's tumour (18 cases; 29.5%).

In the present study, sensitivity of FNAC in diagnosing salivary gland tumors between benign and malignant by comparing with its histology was 75%, specificity was 93.75%, negative predictive value was 93.75%, positive predictive value was 75%, percentage of false positive cases was 25%, percentage of false negative cases was 6.25% and diagnostic accuracy was 90%. Khandekar M.M. et al [1] showed the sensitivity was 94.54% and specificity was 80.95%. Jayaram N et al [7] showed the sensitivity was 80.9% and specificity was 94.3% while accuracy was 87.70%.

CONCLUSION

FNAC of salivary gland tumors is advantageous to both the patient and the clinician because of its immediate results, accuracy, economy and lack of complications. FNAC has high diagnostic accuracy (90% in the present study). FNAC is useful as an outdoor diagnostic procedure because of the availability of early diagnosis in comparison with the histopathological diagnosis.

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