ORIGINAL RESEARCH PAPER

Pathology

CYTOPATHOLOGICAL STUDY OF SALIVARY GLAND SWELLING AT TERTIARY CARE CENTRE IN JHARKHAND

KEY WORDS:

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ABSTRACT

Fine needle aspiration cytology of salivary gland lesion displays a striking range of morphologic diversity that can make cytologic interpretation difficult. This is due in part to the wide range of lesions both reactive and neoplastic along with cyto-morphologic diversity that overlap between benign and malignant salivary gland tumors.

This was a retrospective observational study spanning over five years carried out in the Department Of Pathology, Rajendra Institute Of Medical Science, Ranchi. 247 patients with salivary gland swelling were included in the study.

The Most common salivary gland lesion were benign mass (62.34%) followed by reactive lesion (27.53%) and few cases showing malignant growth (10.13%). Among benign mass Pleomorphic Adenoma (80.72%) was the commonest lesion, males (58.2%) were slightly more affected than females (41.80%). Whereas Mucoepidermoid Carcinoma (52%) was the commonest amongst malignant lesions in which female (84.62%) preponderance was observed.

Fine needle aspiration cytology has gained wide acceptance as a first line procedure in the evaluation of a salivary gland swelling. It is a reliable, accurate and effective tool for diagnosing this complex group of lesions.

INTRODUCTION

Fine needle aspiration cytology is a minimally invasive procedure fit for diagnosing salivary gland lesions. The objectives of FNAC in salivary gland lesions is to

- Confirm the origin of lesion whether it is from salivary gland or from adjacent tissue.
- Among salivary gland lesions it can be categorized into non-neoplastic or neoplastic.
- If neoplastic, whether it is benign or malignant.
- In maximum cases exact tumor type can be predicted by FNAC, if not then histopathological examination can be done to confirm the type.

FNAC should always be performed in conjunction with clinical and radiological findings as preliminary assessment of a salivary gland mass on which the management of the disease is based.[1]

The salivary gland is an exocrine gland which produces saliva in buccal cavity. There are three major types of salivary glands- Parotid, submaxillary (submandibular) and sublingual glands. Numerous minor salivary glands are distributed throughout the mucosa of the buccal cavity. Stenson duct is the main duct of the Parotid gland which emptys into the oral cavity opposite the crown of the second maxillary molar tooth. Wharton duct and Bartholin duct are ducts of submaxillary and sublingual respectively both of which open in the floor of mouth adjacent to frenulum of the tongue.[2]

Pathological swellings of the salivary glands can occur because of inflammatory process, cyst or neoplasms. Neoplasm of the salivary glands are rare, constitutes less than 2% of all human tumors.

A summary of 2005 WHO nomenclature lists 11 types of benign tumors as

- Pleomorphic adenoma
- Myoepithelioma
- Basal cell adenoma
- Warthin's tumor
- Oncocytoma
- Canalicular adenoma
- Sebaceous adenoma
- Lymphadenoma
- Duct papilloma
- Cystadenoma
- Hemangioma

Malignant tumors are divided according to the tumor grade

a) Low grade tumors

- Mucoepidermoid carcinoma
- Acinic cell carcinoma
- Polymorphous low grade adenocarcinoma
- Epithelial-myoepithelial carcinoma
- Basal cell adenocarcinoma
- Sialoblastoma
- MALT lymphoma
- Clear cell carcinoma, NOS
- Cystadenocarcinoma
- Adenocarcinoma NOS

b) Intermediate grade

- Mucoepidermoid carcinoma
- Adenoid cystic carcinoma
- Adenocarcinoma NOS
- Myoepithelial carcinoma
- Sebaceous carcinoma

c) High grade

- Mucoepidermoid carcinoma
- Salivary duct carcinoma
- Carcinoma ex-pleomorphic adenoma
- Carcinosarcoma
- Squamous cell carcinoma
- Small cell carcinoma
- Lymphoepithelial carcinoma
- Diffuse large B-cell lymphoma
- Adenocarcinoma NOS
- Large cell carcinoma
- Oncocytic carcinoma

- Risk factors for development of salivary gland cancer are-
- Exposure to radiation eg- patients receiving radiotherapy in head and neck region
- Industries including manufacturer of rubber product, plumbing and wood works

- Exposure to substances like Asbestos, Nickel alloy, Chromium or silica dust.

The sensitivity of salivary gland FNAC ranges from 86 to 100% and the specificity ranges from 90-100%. The variation on accuracy of cytological diagnosis may be due to sampling errors for eg false negative diagnosis in cystic tumours. Limitation to accuracy due to the small size and selective character of FNAC samples has been observed. Different tumour types have overlapping cytological features for eg hyaline stromal globules which is typically seen in adenoid cystic carcinoma is also found in other types such as basal cell adenoma, canalicular adenoma, basal cell adenocarcinoma, pleomorphic adenoma and so on.[3]

MATERIAL AND METHODS

Place- This study was done in the Department of Pathology, RIMS Ranchi.

Duration – This study was carried out during year 2016-2020
Type of study- This is a retrospective observational study.

Sampling method- Patients with salivary gland lesions referred for cytopathological examination were selected as study subjects. FNAC of salivary gland lesions is done for diagnostic evaluation.

INCLUSION CRITERIA –
Patients presenting with palpable mass of salivary gland and its duct appendages.

EXCLUSION CRITERIA –
Patients with impalpable or hemorrhagic salivary gland lesion. Palpable mass with overlying infective skin lesion.

Data collection- Total number of patients with salivary gland lesion are 247 who had come for cytopathlogical examination in the department of pathology , RIMS Ranchi during five years period 2016-2020. Reports of the patients with salivary gland lesions along with FNAC slides, stained with H&E were retrieved. Age, sex, site of lesions were taken in consideration.

Data analysis – data analysis was reported in terms of frequencies and percentages.

RESULT

Table- 1 Spectrum Of Salivary Gland Lesions

TYPES OF LESION	FREQUENCY	PERCENTAGE
Non-neoplastic/ Reactive	69	27.94%
Neoplastic		
Benign	153	61.94%
Malignant	25	10.12%

With the help of FNAC various types of salivary gland lesions were encountered in this study. Most of the cases were found to be benign (61.94%) followed by reactive disorder of salivary gland (27.94%). Rest were malignant cases (10.12%).

Table -2 spectrum of non-neoplastic lesions on cytology

Name of the lesions	FREQUENCY	PERCENTAGE	MALE	FEMALE
Chronic sialadenitis	34	49.28%	19	15
Acute on chronic sialadenitis	3	4.35%	1	2
Sialadenosis	18	26.09%	13	5
Cyst	14	20.28%	8	6
	69	100%	41	28

Among the non- neoplastic reactive lesions, chronic sialadenitis was the most common lesion with male predominance with male is to female ratio 1:1.27

Table-3 spectrum of benign lesions on cytology

Name of lesions	FREQUENCY	PERCENTAGE	MALE	FEMALE
Pleomorphic adenoma	148	96.73%	83	65
Warthin's tumor	1	0.65%	1	0
Oncocytoma	3	1.97%	3	0
Monomorphic adenoma	1	0.65%	0	1
	153	100%	87	66

Pleomorphic adenoma (96.73%) was the most common benign tumour which was followed by oncocytoma (1.97%). Out of 148 cases of pleomorphic adenoma 83 were male patients. Monomorphic adenoma was the rare case.

Table-4 Spectrum Of Malignant Lesions On Cytology

Name of lesions	FREQUENCY	PERCENTAGE	MALE	FEMALE
Mucoepidermoid carcinoma	13	52%	2	11
Carcinoma ex-pleomorphic adenoma	3	12%	1	2
Adenoid cystic carcinoma	5	20%	3	2
Acinic cell carcinoma	3	12%	3	0
Salivary duct carcinoma	1	4%	0	1
Total	25	100%	9	16

Mucoepidermoid carcinoma 52% was the most common malignant tumour followed by adenoid cystic carcinoma (20%). Out of 13 cases of mucoepidermoid carcinoma 11 were female patients.

Table-5 Age Distribution Of Benign Salivary Gland Tumors

Name of lesions	0-10 years	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years
Pleomorphic adenoma	5	19	53	35	14	15	7
Oncocytoma	0	0	0	0	2	1	0
Warthin's tumor	0	0	0	1	0	0	0
Monomorphic adenoma	0	0	0	1	0	0	0

The age group of patients with benign lesion was 21-40 years comprising of 90 cases out of 153. Maximum number of pleomorphic adenoma cases were found in age group 21-30 years.

Table- 6 Age Distribution Of Malignant Salivary Gland Tumors

Name of the lesions	0-10 years	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years
Mucoepidermoid carcinoma	0	1	1	2	0	4	3	2
Adenoid cystic carcinoma	0	0	1	1	1	1	1	0
Carcinoma ex-pleomorphic adenoma	1	0	0	0	0	1	0	1
Acinic cell carcinoma	0	0	0	2	0	0	0	1
Salivary duct carcinoma	0	0	0	0	0	1	0	0

Malignancies were common in age group 51-80 years among them mucoepidermoid carcinoma was the most common malignant lesion found in age group of 51-70 years.

DISCUSSION

Salivary glands are exocrine in nature secreting saliva in buccal cavity. It is composed of ductal and acinar portion. Acinar portion is either serous or mucinous type. Salivary gland disease may be either due to local or systemic causes. Most of the diseases of salivary gland have swelling/mass like features. A mass may be due to benign or malignant growth. A swelling without any growth may occur due to inflammation or blockage of drainage system of salivary gland, etiological factors being viral, bacterial, rarely fungal or any systemic causes.

Non neoplastic lesions : The most common diagnosed case was chronic sialadenitis contributing 49.28% (34/69). Chronic sialadenitis as found more in males(55.88%, 19/34) than females (44.12%, 15/34)

Microscopically the smears from patients diagnosed as chronic sialadenitis showed mainly of ductal epithelial cells associated with only few acinar cells and inconspicuous inflammatory cells. Cases of acute on chronic sialadenitis had polymorphonuclear cells, lymphocytes, ductal epithelial cells and cellular debris.

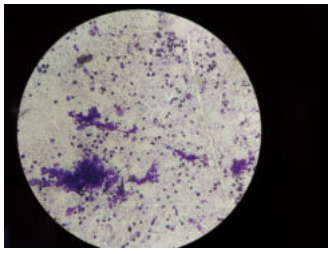

Figure1- Chronic sialadenitis

Benign lesions : The most common diagnosed case was pleomorphic adenoma (96.73%, 148/153) affecting males (56.08%, 83/148) more than females (43.92%, 65/148). Microscopically the smears of pleomorphic adenoma case showing chondromyxoid matrix admixed with spindle or rounded cells.

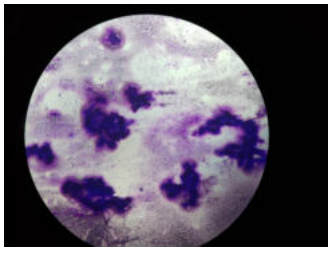

Figure2a – Pleomorphic adenoma

Malignant lesions: low grade mucoepidermoid carcinoma was one of the commonest malignant salivary gland tumours occurring in all age groups including children and adolescents.

Adenoid cystic carcinoma (AdCC) is a common malignancy in the minor salivary glands. Third most common malignant tumour in adults was acinic cell carcinoma occurring in parotid glands. This is low/intermediate grade malignant epithelial neoplasm of the salivary glands characterized by serous acinar cell differentiation (cytoplasmic zymogen granules) in atleast some of the neoplastic cells.

Microscopically the smear of adenoid cystic carcinoma showing freely scattered cells as well as in clusters along with hyaline spherical globules. The cells have uniform, round to oval hyperchromatic nuclei, scanty cytoplasm, high nuclear-cytoplasmic ratio and with prominent nucleoli. Whereas the smear of acinic cell carcinoma showing cluster of cells in microacinar pattern with inconspicuous fibrovascular stroma against abundant fragile finely vacuolated occasionally dense oncocytic like cytoplasm.

Figure3- Adenoid cystic carcinoma

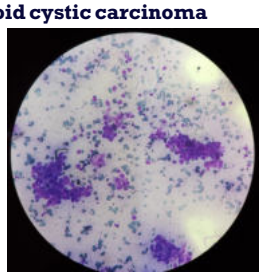

Figure4- Acinic cell carcinoma

REFERENCES

1. Svante R. Orell, Gregory F. Sterrett, Orell & Sterrett's Fine Needle Aspiration Cytology 5th Edition, Head & Neck;Salivary glands Ch. No. 4, Churchill Livingstone Elsevier 2012;39.
2. Juan Rosai, Rosai and Ackerman's Surgical Pathology, Tenth edition , Major and Minor Salivary Glands, Ch. No-12, Elsevier Mosby , 2011; 817.
3. William C. Faquin, Celeste N. Powers, Salivary Gland Cytopathology 5th edition, Introduction to FNA and Salivary Gland Neoplasia , Ch. No-1, Dorothy L. Rosenthal Springer 2008; 6:13: 10-12.
4. Sandhu VK, Upenders, Singh N, Puri A, Cytological spectrum of salivary gland lesions and their correlation with epidemiological parameters, J Oral Maxillface Pathol. 2017; 21(2):203-210.
5. Kumar, Abbas, Aster, Robbins & Cotran Pathologic Basis of Disease, South Asia Edition, 8th Edition, Head and neck, Ch. No- 16, New Delhi:Reed Elsevier India Pvt. Ltd., 2019;