Clinico-Pathological Review Study of Neoplastic Diseases of Major Salivary Glands with Radiological Correlation

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ABSTRACT

Introduction: There are 2 types of salivary gland tumors – major comprising of parotid, submandibular and sublingual glands and numerous minor salivary glands with maximum number in hard palate, soft palate, buccal mucosa, nasopharynx etc. Most salivary glands tumors are benign with less than 20% of them being malignant and are named according to the cell types found under microscopy. Aims and objective of the study was to correlate the clinical diagnosis along with cytology, radiology and histopathological diagnosis and the role of FNAC, USG and CT/MRI in the neoplasms of salivary gland tumors.

Material and methods: From all patients attending ENT OPD in our hospital with complaints of salivary gland swellings were evaluated according to the exclusion/inclusion criteria were selected for the study over a span of one year. FNAC is a valuable test but its role is controversial.

Results: Ultrasound can delineate location, homogeneity or heterogeneity, shape, vascularity and margins. CT/MRI help in evaluating the extraglandular extension, predict possibility of malignancy based on poorly defined margins.

Conclusion: In our study we found that clinical examination, FNAC and USG of the tumor gives us adequate knowledge about nature of disease and should be the ideal first line modality of investigation with CT/MRI as the next to go option for the evaluation and planning of a malignant disease management.

Keywords: Salivary Gland Tumors, Salivary Gland Tumor Radiological Features

INTRODUCTION

The major salivary gland are the parotid, submandibular and sublingual glands. Neoplasms relating to major salivary glands include benign tumors like pleomorphic adenoma, Warthins tumor and malignant tumors namely mucoepidermoid cancer, acinic cell carcinoma, adenoid cystic carcinoma, adenocarcinoma, malignant mixed cancers, squamous cell carcinoma, anaplastic carcinoma, lymphoepithelioma etc.

Neoplasms of salivary glands though uncommon, are of particular interest because of their varied histological and biological characteristics and the difficulties during management. The majority of these neoplasms are benign and only 20% are malignant. Salivary gland tumors constitute about 0.5% of all cancers and 5% of head and neck malignancy.[1,2]

Clinical features of underlying malignancy include ipsilateral facial nerve palsy, sudden increase in size of tumor, pain, tumor fixation to the overlying skin or underlying muscle, and cervical lymphadenopathy.

The definitive diagnosis is possible only through histological investigations. FNAC is a very useful investigation in this regard with high accuracy. Radiological modalities like ultrasonography, CT and or MRI help to see the extension of the tumor accurately which is necessary for planning of the definitive management.

In this study, the demography of clinical and pathological spectrum of Salivary gland neoplastic diseases and their correlation with different radiological modalities were studied and compared with established literature.

MATERIAL AND METHODS

The present study was conducted in a tertiary care hospital, Kolkata during the period from February 2017 to January 2018. All Patients having FNAC suspected major Salivary Gland tumors, attending OPD and IPD were included in the study. Patients who had previously undergone surgery of salivary glands and having contraindications for radiological investigations and surgical interventions were excluded. A standard protocol was followed consisting of detailed history and physical examination, radiological evaluation followed by fine needle cytological examination. Histopathological examination was done in all the excised tumours for final diagnosis. Appropriate representation of data is done in table format and statistical tools like accuracy etc. were used wherever required.

Following parameters were studied

1. Age and Sex distribution of the tumours were noted.
2. Clinical presentations of these tumours.
3. Comparison between clinical provisional diagnosis and histocytopathological diagnosis.
4. USG was done in all patients having major salivary gland tumor and CT/ MRI was done in cases of heterogenous features on USG, to see the extent and features of major salivary gland tumors and radiological

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diagnosis was obtained. Further comparison of this radiological diagnosis with obtained clinical and histocytopathological diagnosis was done to find any correlation.

RESULT

Incidence of the disease

In this study, period from February 2017 to January 2018, a total no of 31 patients diagnosed as suffering from salivary gland tumor attended the OPD. Among patients 23 tumors were benign tumors and 8 were malignant salivary gland tumors.

Age group (in years)	Number of cases	Percentage
10-19	1	3.2
20-29	7	22.5
30-39	6	19.3
40-49	7	22.5
50-59	6	19.3
60-69	3	9.6
70-79	1	3.2
Table-1: Age distribution		

Percentage of salivary gland tumors

In present study,

Benign tumor%	Malignant tumor%
74.19	25.80

Age distribution

In our study, the age of the patients ranged from 13 years to 72 years. The mean age was 42.59 years and the median age were 42 years. Table-1 shows the age distribution of cases . In our study, salivary gland tumors are common in 2nd and 4th decade of life and less common in 1st decade of life.

Sex distribution

In the present study, out of 31 patients, we had 17 female patients and 14 male patients. Therefore, the percentage of female was 54.83% and that of male was 45.17%.

Symptoms

The most important symptoms of the tumorous patients stated in table 2, accordingly results were noted. As observed, swelling is most common and facial deviation is the least common symptoms of salivary gland tumor found in our study.

Signs

Symptom	Number of patients	Percentage
Swelling in front and below of ear and upper neck	31	100%
Pain	6	19.35%
Ulceration	2	6.45%
Facial deviation	1	3.22
Table-2: Showing distribution of cases according to symptoms		

Signs	Number of patients	percentage
Swelling in the parotid region	23	74.19%
Swelling in the submandibular region	8	25.80%
Swelling in the parotid region with fixity	2	6.45%
Swelling in submandibular region with fixity	3	9.67%
Ulceration over swelling	2	6.45%
Neck node palpable	2	6.45%
Facial nerve palsy	1	3.22%
Table-3: Showing distribution of cases according to signs		

FNAC result	Number of case	Percentage%
Pleomorphic salivary adenoma	23	74.19
Warthin tumors	2	6.45
Muco-epidermoid CA	4	12.90
Carcinoma ex pleomorphic adenoma	1	3.22
Adenoid cystic carcinoma	1	3.22
Table-4: FNAC result of cases		

Histopathological diagnosis	Number of case	Percentage
Pleomorphic salivary adenoma	21	67.74
Warthin tumors	2	6.45
Muco-epidermoid CA	4	12.9
Carcinoma ex pleomorphic adenoma	3	9.67
Adenoid cystic carcinoma	1	3.22
Table-5: Histopathological diagnosis		

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FNAC	HISTOPATHOLOGY
Pleomorphic – 23	Pleomorphic – 21 Mucoepidermoid ca – 1 CA EX pleomorphic adenoma – 1
Warthin – 2	Warthin – 2
Muco-epidermoid - 4	Mucoepidermoid – 3 CA EX pleomorphic adenoma – 1
Carcinoma ex pleomorphic adenoma – 1	Carcinoma ex pleomorphic adenoma – 1
Adenoid cystic carcinoma – 1	Adenoid cystic carcinoma – 1
Table-6: Correlation between FNAC and histopathology	

FNAC	USG	CT/MRI	Histopathology
Pleomorphic adenoma – 23	In 20 cases -Well defined margins, lobulated, internal structure homogenous In 3 cases – heterogenous echopattern	In 2 cases of the 3 – CT- well defined margins hypodense. In 1 case –MRI- well defined hyperintense, lobulated mass on T2 weighted images.	Pleomorphic adenoma – 21 Mucoepidermoid carcinoma – 1 CA EX pleomorphic adeno-ma – 1
Warthins tumor – 2	Well defined, non lobulated contour, heterogenous in all cases	CT – smoothly bordered, heterogenous lesions in all cases	Warthins tumor – 2
Mucoepidermoid carcinoma – 4	Heterogenous, hypoechoic mass, well defined margins in 3 cases. Heterogenous hypoechoic irregular mass in 1 case	CT in 2 cases - well delineated smooth margins, cystic area with focal calcification. CT in 1 case- heterogenous, irregular margin with focal necrosis MRI in 1case – low signal intensity on both T1 and T2 weighted images	Mucoepidermoid carcinoma- 3 CA EX pleomorphic adeno-ma- 1
Carcinoma ex-pleomorphic adenoma – 1	Heterogenous, hypoechoic irregular mass	CT - irregular mass with microcalcification.	Ca ex pleomorphic adenoma -1
Adenoid cystic carcinoma – 1	Heterogenous, hypoechoic, mass, punctate calcification in all cases	MRI – high signal intensity on T2 weighted image with cribriform pattern	Adenoid cystic carcinoma -1
Table-7: Different tumors and correlation			

Investigation done	Benign tumor	Malignant tumor
CT scan	3	5
Histopathology	2	6
Table-8: Shows CT And Histopathology Result Of Same Cases		

Investigation done	Benign tumor	Malignant tumor
MRI	1	2
Histopathology	1	2
Table-9: Shows MRI And Histopathology Result Of Same Case		

Parotid gland tumor	Benign	Malignant
Clinical diagnosis	19	4
Radiological diagnosis	18	5
Table-10: Show Cases Relation With Radiological And Clinical Diagnosis Of Parotid Tumor.		

Submandibular gland tumor	Benign	Malignant
Clinical diagnosis	5	3
Radiological diagnosis	5	3
Table-11: Show Relation Between Clinical And Radiological Diagnosis Of Submandibular tumors		

As like the symptoms, the most significant clinical sign per patient were taken into account. The data shown in table-3 came into light accordingly.

Cytopathology (FNAC) study of cases
The FNAC examination result revealed as stated in table-4. Pleomorphic salivary adenoma was highly noted in the subjects.

Histopathology
Table-5 shows histopathological diagnosis of different cases and their percentage. Table 6 shows the correlation between FNAC and histopathology

Analysis of Radiological investigation of different tumors and correlation
In our study, all 31 patients were sent to our radiology department for ultrasonography of the tumors. The ultrasonography reports which show heterogeneous irregular hypoechoic mass were sent for CT/MRI to know the nature of tumors. The radiological findings of each type of tumor are discussed in table-7.
We had 8 patients with CT scan reports, for histopathological correlation. Table 8 shows, one case was benign in CT report but after histopathology examination result came malignant.

We had 3 patients with MRI reports, for histopathological correlation. Table 9 shows that MRI reports correlate hundred percent with the histological reports.

Radiological (USG, CT Scan, MRI Scan) correlation with clinical diagnosis of parotid gland and submandibular gland.

Table 10 shows cases relation with radiological and clinical diagnosis of parotid tumor. Table-11 show relation between clinical and radiological diagnosis of submandibular tumors

DISCUSSION

The annual incidence of salivary gland tumors ranges from 0.5-2/100,000 in different parts of world[1]

In present study, the mean age was 42.59 years and the median age was 42 years.

Regarding sex distribution, in our study, there is female predominance (54.83%) and males constituted to 45.17% .Some of the studies show female preponderance where as others shows slight excess in male but sex differences are not significant.[2]

Fiorella et al showed 13.8% and 79.8% of their patients had malignant and benign neoplasm in parotid gland respectively.[3] It was seen that in respect of parotid gland tumors our results were similar to previous study. With respect to submandibular salivary gland, Afify et al[4] in their study found 40% and 50% benign and malignant tumor respectively while in our study, 55% were benign and 45% were malignant tumors.

In the present study, FNAC reports showed Pleomorphic salivary adenoma was most common (74.1%) salivary gland tumor, which is coherent with researchers from other parts of world with Pleomorphic salivary adenoma accounting for 40.4-89.9% of all salivary gland tumors.[5]

In present study, mucoepidermoid carcinoma was most common malignant tumors as per FNAC (12.5%) which are comparable with Michael Cohen's[6], Jayaram, et al.[7]

Diagnostic accuracy of FNAC in present study was 91%. Diagnostic accuracy of FNAC in various series Quizilbash et al[8] (1985)93%, Layfieldet al[9] (1987)92%,Kocjan et al[10] (1990)86%.

Disconcordant diagnoses between cytology and histopathology results were observed in 3 cases. The main problem in the diagnosis of this case was the lack of a representative sample.This problem has previously been highlighted by Klijanienko et al[11] who found that carcinoma ex pleomorphic adenoma has the highest false negative rate (35.3%) of all malignant salivary gland tumours which was also observed in our study. Multiple sampling is important to overcome problems of misdiagnosis due to selective sampling.[12]

In our study, 20 patients out of 23 (FNAC reported pleomorphic adenoma), usg findings were Contour was Lobulated. Internal Structure was Homogenous. A number of ultrasonographic features are considered typical for pleomorphic adenoma namely, sharp borders, lobulations of the contour, homogeneous structure, poor vascularization, acoustic enhancement,[13] which correlates with the ultrasonographic pictures of our present study. In our study, two cases of pleomorphic adenoma on CT scan showed well defined margins with hypodense area. In previous study by H. Tie at al[14] we see similar feature. One patient with Pleomorphic adenoma on FNAC was advised MRI (T2) for academic purpose in shows a well defined lobulated hyperintense mass,in the study of A. Conejero Olesti at al[15] shows similar feature.

Ultrasound finding of mucoepidermoid carcinoma in the study was heterogeneous hypoechoic mass with well-defined Margin, similar finding was observed by Taneja et al in their study.[16] On MRI, the tumor showed low signal intensity on T1 and T2 weighted images which is coherent with previous established data.[14] In our study, we sent one patient of carcinoma ex pleomorphic adenoma for CT scan, finding was irregular mass with micro calcification, similar features was observed in a case report by H. Kato et al.[17]

We had one case of Adenoid Cystic Carcinoma during study period with ultrasound showing heterogeneous hypoechoic ovoid mass with punctate calcifications which is comparable with the study by Vijai Pratap, S K Jain et al.[18]

The Low grade tumours are usually demonstrated as well defined, homogeneous lesions similar to benign parotid tumours, and high grade tumours appear to be poorly defined and demonstrate heterogeneity, sometimes with an irregular focal necrosis.

CONCLUSION

In the present study, the mean age for salivary gland tumors was 42.59 years and the median age was 42 years, had a female preponderance, with a male female ratio of 1:1.13. most of the patients were presented with swelling over parotid region, followed by submandibular swelling.Other reported symptom/signs were pain, ulceration, and cranial nerve palsies. The most common histological type of tumor was pleomorphic adenoma of parotid gland.

FNAC and Ultrasonography in all the cases is the investigation panel of choice and, along with proper clinical examination, is adequate for the management of a benign disease.

CT/MRI is recommended only to patients with suspected malignancy features on clinical examination and FNAC/USG.

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