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CYTOLOGICAL STUDY OF LESION CAUSING PAROTID GLAND ENLARGEMENT THROUGH FNAC

Pathology

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KEYWORDS:

INTRODUCTION

A broad spectrum of pathologies that present with parotid swelling and extraglandular masses can also mimic parotid lesions clinically. It is frequently difficult on clinical grounds alone to distinguish between neoplastic and non-neoplastic causes for a parotid mass and also to reliably differentiate between benign and malignant neoplasms. Fine-needle aspiration cytology (FNAC) was used for the investigation of salivary gland lesions for the first time simultaneously in the 1920s in the United States and in Europe.[1,2]. This procedure was thoroughly developed in the 1950s and 1960s by the Karolinska Institute in Stockholm[3] and the Institute of Curie in Paris4 and popularized in the 1970s. A large and growing body of literature intent on applauding its importance as a diagnostic tool has consistently documented accuracy rates ranging from 80 to 98% [5-8], a truly remarkable performance given the bewildering large and diverse group of neoplastic and inflammatory lesions to involve the parotid gland.

The main goal of FNA of salivary gland lesions is to assist the clinician in the management of patients who present with a mass lesion. Cytological examination aims to determine if a process is of salivary gland or non-salivary gland origin, whether inflammatory and/ or reactive, if neoplastic, whether benign or malignant, and if possible to render a specific diagnosis. Tumors of parotid region comprise 3% of all head and neck and 0.6% of all tumors of human body. Histologically, pleomorphic adenoma most common salivary gland tumor, comprising 50-60% of all salivary gland neoplasm and approximately 60-80% of parotid gland neoplasm [9].

Aims and objectives

The primary Aims of the study were:

1) To study the adequacy of FNA from lesion of parotid
2) To render cytodiagnosis and study the cytomorphological features in the aspirates so obtained.
3) To identify the problems encountered in cytological interpretation of aspirate from the mentioned site.
4) To correlate the result with histology if available

MATERIALAND METHODS

The study was conducted in the postgraduate department of pathology, S.N. Medical College and Hospital, Agra from 2010 to 2012 in 50 consecutive cases, after the Institutional ethics committee clearance. Fine needle aspiration smears from patients with parotid gland lesions were received in cytology section of department of pathology for cytological evaluation.

RESULTS

Parotid gland lesions were more common in males (30, 60%) as compared to females (20/ 40%). In our study maximum no. of cases of parotid gland lesions were observed in 3 -4th decade, whereas minimum no. of cases of parotid gland lesion were observed in first decade. The youngest patient in our study was 10 years old and the oldest patient was 72 years old.

Table 1: Demographics

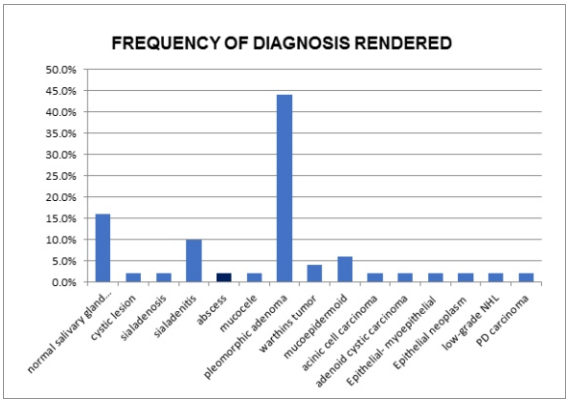
Sex	Lesions of parotid	
	Number of cases	Percentage (%)
MALE	30	60%
FEMALE	20	40 %

Table 2: Age wise distribution

S. No.	Age Range (years)	Lesions of parotid	
		Number of cases	Percentage (%)
1.	0-10	01	2%
2.	11-20	05	10%
3.	21-30	12	24%
4.	31-40	11	22%
5.	41-50	08	16%
6.	51-60	08	16%
7.	61-70	05	10%

In our study, benign lesions accounts 48% which were more than malignant neoplasms which were 18% and among benign neoplasms pleomorphic adenoma alone accounts for 44% of the lesions. In non-neoplastic lesions 18% of lesions were observed.

Table 3: Frequency of tumors



Most common parotid gland lesion in our study is pleomorphic adenoma accounting 44% of cases. In pleomorphic adenoma 9 cases were males and 13 were female. So females seem to be more commonly affected and maximum number of cases observed in 3rd -4th decade.

Adequacy- The aspirates were considered adequate if the cellular element was sufficient for rendering diagnosis. Adequate aspirates were obtained 42 out of 50 (84%) and inconclusive or non-representative (normal salivary tissue) were 08 out of 50 (16%). The aspirates were considered inadequate when the smear is acellular, hypocellular, comprising of blood , few inflammatory cells , debris , preparation, fixation and staining artifacts.

Cytological diagnosis:

1) Non–representative cases- non representive referred to all those cases which contained mostly normal salivary gland (acini and ducts) . In present study , there were 08 non representative aspirates. Some had abundant and other had moderate to patchy cellularity specially at the head end of smear with hemorrhagic background .
2) Non neoplastic cases- 09
3) Case conclusive of benign neoplasm – 24
4) Case conclusive of malignant neoplasm -09

In our study 16% of parotid gland aspirates revealed only normal salivary gland elements, the presence of normal salivary gland as the only cytologic finding are placed under Non-representative group and these warrants clinicoradiologic correlation to exclude the significant possibility of sampling error.

DISCUSSION

In the current study, a total of 50 cases of Parotid gland enlargement were studied. 22(44%) cases were diagnosed to be Pleomorphic adenoma, [3](6%) were diagnosed as Mucoepidermoid carcinoma, 2(4%) cases were diagnosed as Warthin's tumour, 1(2%) came out to be Acinic cell carcinoma, Adenoid cystic carcinoma, Non-Hodgkin's lymphoma, poorly differentiated carcinoma each and the rest [9](18%) belonged to non-neoplastic group which mainly included lesions as sialadenosis, sialadenitis, mucocele etc.

Male female ratio in our study for all Parotid gland lesions was observed to be 3:2. Nettle & Orell[10] also reported M: F ratio of 3:2 in salivary gland neoplasm, Kanwar et al[11], Zafari Alice[12] and Mohammad Sohail et al[13] also found male predominance while Zurrida et al14 and Micheal Lurie et al[15] reported, M: F ratio of 1:1.

Age ranges in our study was found to be [10-70] years for all the lesions observed of parotid gland while Stewart CJR et. al. [16] reported age range to be [20-92] years for various lesions of salivary gland. Muhammad S. et al[13] reported, age range for parotid lesions to be [10-70] years with a mean age of 42 years. In our study, maximum incidence of parotid gland swelling was observed in 3rd and 4th decade of life which is in positive relation with the original article of Ammena Ashraf et al[17,] however in other study the mean age was in early sixth decade[18,19]

In our study, benign lesions (non-neoplastic and neoplastic) of the parotid gland accounted for 82% of cases and the rest 18% of the cases accounted for malignant neoplasms which is in with concordance with Nettle & Orell[10,] and Ammena Ashraf et al[17] who found, that the incidence of benign neoplasms and malignant neoplasms was 79.5% and 20.5% and 68% and 18% respectively. Peter Z et al[20] reported 71.5% of the lesions to be benign including neoplastic and non-neoplastic both and 28.5% of the lesions to be malignant.

Sensitivity of FNAC in benign parotids gland lesions in our study was 100%, specificity was 50%, positive predictive value was 92%, negative predictive value was 50%. The sensitivity of our study was in near positive relation with most of the published data (Jose A corrila et al[21], 92%). However, Costas A[22], Mohammad sohail[13], Peter Z[20], Alice zafari[12] and Michael Lurie[15] et al reported sensitivity of 86%, 74%, 66%, 66% and 64% respectively. There were no complications related to FNAC in the present study.

50 FNAC were done in the present study and 13 specimens were available for histopathological evaluation. Cytopathological diagnosis were correlated with histopathological findings.

	Histopathology	Numbers	%
Benign	Pleomorphic adenoma	10	58.88
	Warthins tumor	2	11.76
Malignant	Adenoid cell Ca	1	5.88

Out of 24 benign lesions, there were 13 specimens which were available for histopathological evaluation. 10 were diagnosed as Pleomorphic adenoma, 2 as Warthins Tumor and 1 was Adenoid cystic carcinoma, which was wrongly diagnosed as benign lesion in cytological evaluation.

Pleomorphic adenoma was the most common lesion observed overall as well as the most common benign neoplasm, accounting for 44% cases. This result is in concordance with Kanwar deep et al[11] and Christopher G et al[18] who found the incidence of parotid gland adenoma 51.7 % and 39.64%, respectively. Maximum numbers of cases were in the 3rd to 4th decade and male to female ratio was observed to be 9:13. Squamous metaplasia was seen in 2 cases, intranuclear inclusions were seen in 2 cases and macrophages were seen in 3 cases. Similar features were described by Eneroth et al23, Qizilbash et al[24].

Out of 22 cases of pleomorphic adenoma, 10 were subjected to histology and cytodiagnosis were verified. Das et al[25] conducted his study on 25 histologically confirmed cases of Pleomorphic adenoma. There was complete concordance between cytology and histology. Epithelial cells and myxoid matrix were present in all cases. They found that there was no significant difference between smear and tissue section with respect to frequency of squamous metaplasia, oncocytic change, acinus formation, papilla formation, mucus globules, giant cells, nuclear pleomorphism, nuclear chromatin pattern, and mitotic figures. Morphological parameters that were significantly higher in FNAC compared with histology included intranuclear cytoplasmic inclusions (36.0% versus 8.0%), nuclear grooves (84.0% versus 48.0%), and reniform nuclei (20.0% versus 0.0%). Chondroid matrix was the only parameter which was significantly more common in histology than in cytology (44.0% versus 4.0%).

K Verma[26] in her study stated that most of the cases of pleomorphic adenoma were easily identified because of their characteristic biphasic pattern, comprising epithelial/myoepithelial cells and fibromyxoch ondroid stroma in varying proportions ranging from predominantly epithelial to predominantly stromal types. The observation mentioned by the author was in positive correlation with our study.

Warthin's tumor accounted for 2 cases (4%) of cases observed. Sunil et al[27] and Kanwar Deep et al[11] reported incidence of 1.6% and 10.3%, respectively. Both of our patients were male which shows male predominance as described by Laura et al28. Both the cases showed abundant cellularity with hemorrhagic background, mono-layered sheets of bland oncocytic cells with the presence of lymphocytes. None of the cases showed inclusion or macrophages. These features were same as described by Eneroth & Zajicek et al [29] & Tilde S. Kline et al30

1 (2%) case studied accounted for Adenoid cystic carcinoma. The case showed abundant cellularity, with presence of abundant variable size hyaline globules with cells mainly in sheets with scant cytoplasm, high N: C ratio and nuclear moulding was also observed. Our study finding was in correlation with the findings of study by Quizilblash et al[31] & Nageli H et al[32] who found Hyaline globules in 100% of cases in their study. Perkins M, 200240 mentioned that, adenoid cystic carcinoma is characterized by a mixture of small, uniform, basaloid cells with high N: C ratio and metachromatic stroma and a background rich in scattered naked nuclei. This finding matched the cytological finding of our study.

3 cases (6%) of the cases observed were diagnosed as mucoepidermoid carcinoma. Incidence mentioned by other authors was 1.6% and 8.6% respectively (Sunil et al[27] and Kanwar Deep et al11). All the cases showed scant cellularity with dirty background of mucin and debris.

1 (2 %) of the cases observed was diagnosed as Acinic cell carcinoma. The case showed abundant cellularity with hemorrhagic background, cells lying singly and in sheets. Polygonal cells with abundant, fragile finely vacuolated cytoplasm with mild pleomorphism and round nuclei with bland chromatin were observed. Few cells had prominent nucleoli and few lymphocytes were seen. Many stripped nuclei were also seen.

An Indian study27 showed similar cytological finding as our study. In his study he stated that smears from Acinic cell carcinoma contain abundant cellular material against a clean background with cohesive cells having abundant granular cytoplasm and medium sized nuclei which had little pleomorphism and abundant naked nuclei in the background.

In one case cells on cytology appears as pleomorphic adenoma. However, on the absence of characteristic chondromyxoid stroma a firm diagnosis of pleomorphic adenoma could not be rendered and signed out as an epithelial neoplasm. Non- neoplastic: 9 out of 50 cases were non-neoplastic lesions, Sialadenitis was the most common non-neoplastic lesion with an incidence of 10%, which was previously been noted by Young et al[44] and Cohen et al[45], other non-neoplastic lesions were sialadenosis, abscess and cystic lesion. Normal salivary gland was noticed in 8(16%) of lesions which constitute non-representative group.

In conclusion, FNAC is an rapid , cost effective , reliable , safe , accurate and easy to perform and well tolerated most appropriate investigation of mass lesions involving Parotid . As the diagnostic accuracy is quite high with hardly any complication, FNAC should be routinely performed as a preoperative diagnostic measure in masses of Parotid region.

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