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CYTOMORPHOLOGICAL SPECTRUM OF PLEOMORPHIC ADENOMA IN ASSOCIATION WITH CLINICAL PARAMETERS.

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ABSTRACT… Objectives: Superficial swellings in the head and neck region pose great difficulties in deciding about their nature. Fine needle aspiration cytology (FNAC) is of great help in the initial assessment of these lesions. The aim of the article is to help the surgeons in diagnosis of pleomorphic adenoma in line with clinical information. **Study Design:** Retrospective analysis. **Setting:** Histopathology lab of PMC. **Period:** 2016 to 2018. **Materials and Methods:** 60 aspirates of pleomorphic adenoma recruited. All cases were reviewed independently by two pathologists for cytomorphological findings. **Results:** Spindle shaped myoepithelial cells were more frequently observed in 78% followed by epithelioid 20% and plasmacytoid 1.7% variants. Duct formation was seen in 81.6% and myxoid background in 88.3% aspirates. Out of total 60 cytological smears 56.6% were cellular and 13.3% were hypocellular. In 30% cases the smears showed predominant matrix. **Conclusion:** Our study concludes that cytomorphological features on FNAC in the light of clinical findings can greatly help the surgeons in management of the patients with salivary gland tumors.

Key words: FNAC, Pleomorphic Adenoma, Salivary Gland Tumors.

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INTRODUCTION

Salivary gland neoplasms constitute 6.3% of all head and neck tumors.[1] Among these pleomorphic adenoma (PA) is the most commonly occurring tumor accounting for about 60-72% of all benign epithelial neoplasm.[2,3] In Pakistan, PA comprises 90% of all benign salivary gland neoplasms.[4,5]

It is a mixed benign tumor, composed of both epithelial and mesenchymal components due to which it displays diversity of cytological features on microscopy both on FNAC and biopsy. Though FNAC is widely accepted diagnostic procedure to investigate salivary gland tumors that would guide maxillofacial surgeons for proper excision of the lesion. But variations in cytological spectrum of pleomorphic adenoma on FNAC pose challenges to its accurate diagnosis.[6-9]

The cytomorphological spectrum on FNAC has been studied worldwide but no such work is documented in our region. The aim of this study is to examine FNAC variations of pleomorphic adenoma and its association with clinical and epidemiological parameters to help the clinician in correct diagnosis and management of the patient.

MATERIAL AND METHODS

A retrospective study consisting of 85 patients with salivary gland lesions were recruited from histopathology lab of PMC from 2016 to 2018. Out of total 85 aspirates, 60 were diagnosed as pleomorphic adenoma on FNAC. All

required information of the patients including demographic details, relevant history, clinical data and cytological findings were documented on a predesigned proforma.

Fine needle aspiration cytology was performed with 21-22-gauge needle attached to 05 ml syringe. The smears were fixed in absolute alcohol and stained with Hematoxylin and Eosin (H&E). The cytomorphological spectrum of all smears was evaluated independently by two pathologists.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 19. Mean and standard deviations were measured for continuous variables like age. Chi square test was used to compare categorical variables. Probability value of less than and equal to 0.05 ($P \leq 0.05$) was considered statistically significant.

RESULTS

The present study conducted on 60 aspirates of pleomorphic adenoma showed female predilection with male to female ratio of 1:6. The parotid gland was the frequent site of involvement (58.3%) followed by submandibular gland (41.7%). No case was observed in minor salivary glands (Table-I).

Gender		Site	
Male	Female	Parotid Gland	Submandibular Gland
23(38.7%)	37(61.7%)	35(58.3%)	25(41.7%)

Table-I. Frequency of pleomorphic adenoma according to gender and site (n=60)

According to age, maximum cases were diagnosed in the age group of 21-40 (Table-II) with a mean of 34.82 (S.D ± 14).

S. No.	Age Group	n (%)
1	≤20	12 (20)
2	21-40	30 (50)
3	41-60	17 (28.3)
4	61+	01 (1.6)
5	Total	60 (100)

Table-II. Age distribution in pleomorphic adenoma

The swelling was painless in 98.3% cases in spite of the site. The tumor size in 77.7% cases was 1 to 5 cm in greatest dimension. The history of duration was available for 55 cases which showed that the swelling was present in 45.4% of lesions for more than one year (1-5 years).

Among myoepithelial cells, spindle cell variant (Figure-1) was the most common type (78%) followed by epithelioid (20%) and plasmacytoid (1.7%).

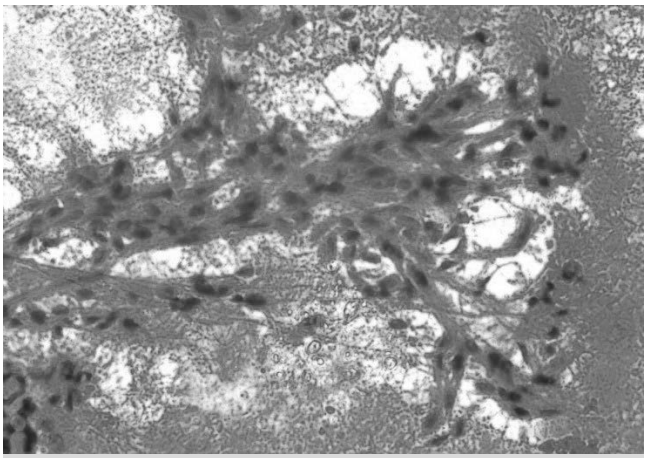

Figure-1. Myoepithelial cells displayed in a hemorrhagic background

As far as epithelial component was concerned, duct formation (81.6%) was predominant (figure 2) followed by honeycomb appearance 13.3% (Figure-3, Table-III).

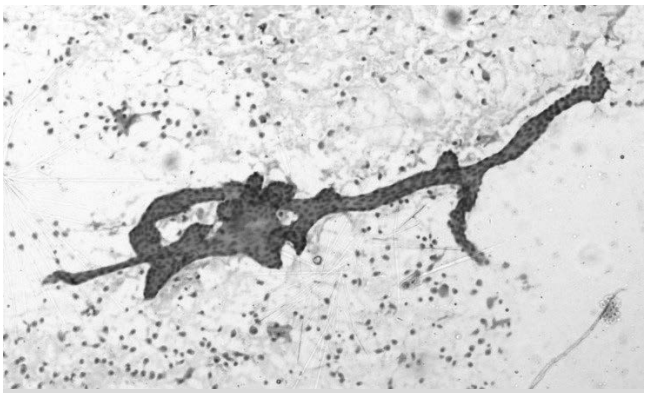

Figure-2. Ductal epithelial cells

Myxoid background (Figure-4) was seen in 53 (88.3%) aspirates. In 3 (5%) cases matrix showed embedded myoepithelial cells while chondromyxoid and fibrillary background was present in 2 cases each (Table-IV).

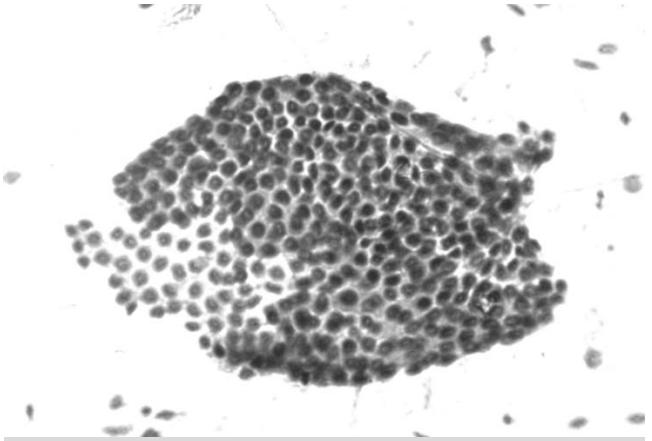

Figure-3. Honeycomb appearance of ductal epithelial cells

Myoepithelial Cells	No of Aspirates (n)
Spindle	47 (78%)
Epithelioid	12 (20%)
Plasmacytoid	01 (1.7%)
Total	60
Epithelial Cells	**No of Aspirates (n)**
Duct Formation	49 (81.6%)
Honey comb pattern	08 (13.3%)
Sheets/clusters	03 (5%)
Total	60

Table-III. Morphological variations in epithelial cell component

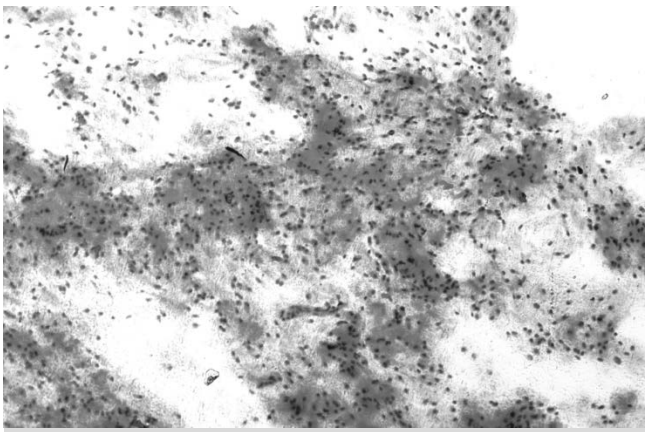

Figure-4. Myxoid stroma

Type of Matrix	No of Aspirates (n)
Myxoid	56 (93.3 %)
Chondromyxoid	02 (3.3 %)
Fibrillary	02 (3.3 %)
Total	60

Table-IV. Types of matrix found on FNAC

Out of 60 cytological smears 34 (56.6%) were cellular while remaining 8 (13.3%) were hypocellular and 18 (30%) showed predominantly matrices as compared to cellular component. Papillary pattern was seen in 23.3% of cases. In background of few aspirates (5%) inflammatory cells like neutrophils, lymphocytes and plasma cells were seen with hemosiderin laden macrophages in 8.3% of aspirates.

The association of the tumor with age, gender and site was not statistically significant.

DISCUSSION

Pleomorphic adenoma is the most regularly diagnosed tumor of all salivary gland pathologies worldwide and in Pakistan.[3,4] Being superficially approachable FNAC is a reliable diagnostic modality for these tumors which help in narrowing its differential diagnosis.[10]

The present analysis reflected 34.82 (S.D ± 14) as mean age of the patients with majority of cases diagnosed in age range of 21-40. These results are similar to other studies conducted in different parts of the globe.[11,12,13] One of the studies from Netherland reported mean age of 48 years in males and 49.6 in females which is dissimilar to our evaluation.[14] Females were more commonly affected with male to female ratio of 1:6.[15,16]

The parotid gland was the most frequent site of involvement in this study followed by submandibular gland. No case was observed in minor salivary glands which is comparable to a Malaysian study.[17] However in another work from Brazil 15.9% cases were diagnosed in palate which is in contrast to this study.[18] The difference could be because we do not receive intraoral lesions for FNAC.

Mostly (45.4%) the tumor presented with a history of 1 to 5 years of duration. The size of maximum tumors (77.7%) was found to be 1-5 cm in greatest dimension.[19]

The presence of both epithelial and stromal components in pleomorphic adenoma makes its

diagnosis easy. However, in cases where only one element is seen the diagnosis becomes difficult on FNAC.[20] The aspirates with less mucus and metaplastic squamous cells can be misdiagnosed for mucoepidermoid carcinoma (MEC). In cases where neoplasm exhibit increased epithelial component can lead to wrong interpretation as myoepithelioma, monomorphic adenoma and low grade carcinoma.[9]

The differentiation of myoepithelial cells is variable in pleomorphic adenoma and may take one of the various forms such as spindle, plasmacytoid, clear and basaloid.[21,22] Our evaluation performed on 60 aspirates showed spindle shaped myoepithelial cells in 78% cases while only one case with plasmacytoid type was observed which is in disparity to the work of Vaneet Kaur Sandhu et al. They demonstrated predominant plasmacytoid differentiation of myoepithelial cells in their two separate studies as 32.8% and 35.4% respectively.[8,9] Nerve sheath neoplasms especially schwannoma should always be well thought-out in diagnosis of spindle myoepithelial rich aspirates of pleomorphic adenoma. These tumors are usually difficult to distinguish from PA due to presence of epithelial and stromal components.[23]

In the current study, oncocytic change was seen in only one case whereas study performed in India observed similar change in 5.9% cases.[8] Papilla formation surrounded by epithelial and myoepithelial cells were prominent in 14 cases. Such cytological smears should be examined carefully to exclude polymorphous low grade carcinoma where pseudopapillary formation is typically seen.[24] The differences observed from other workers in the cytological spectrum of our analysis might be explained on the basis of racial and regional differences.

CONCLUSION

Our study concludes that with the help of clinical details pleomorphic adenoma can be easily diagnosed on FNAC in spite of variations in cytomorphological spectrum.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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1	Fatima Iqbal	Conception and design Acquisition of data.	
2	Nasiha Bashir	Drafting the work.	
3	Abbas Saleem	Critical review of the work.	
4	M. Mumtaz Khan	Final approval of the version to be published.	
5	Tehmina Naushin	Analysis and interpretation of the data.	
6	Sadaf Alam	Final review.