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Fine Needle Aspiration Cytology of The Major Salivary Glands - Its Value

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SUMMARY

Fine needle aspiration cytology (FNAC) is a simple and inexpensive technique for the diagnosis of diverse sites including major salivary glands. We collected the data of 70 patients with salivary gland lesions who underwent the procedure of FNA in our outpatient clinic. These included 41 males and 29 females, mean age 42.1 years (range 2 ½ - 80 years). Site-wise 40 aspirates were from parotid gland and 30 from the sub-mandibular gland. Spread smears were prepared, air-dried and alcohol fixed and stained with Giemsa and Papanicoloau stains respectively. 44 (62.9%) cases were diagnosed as benign and 8 (11.4%) as malignant lesions. Thirteen (18.6%) were non-diagnostic, while 5 (7.1%) were reported as suspicious for malignancy. Pleomorphic adenoma was the most frequent diagnosis made. Histology of the resected specimens was available in 14 (20%) cases. Correlation showed that the FNAC diagnosis were correct in 78.6% of these cases. Despite the controversy among both surgeons and histopathologists as to the value and place of FNAC as a diagnostic tool in salivary gland lesions, our findings support the important role of the simple and cost effective technique of FNAC in the diagnosis of major salivary gland lesions.

Keywords: Fine Needle Aspiration Cytology, Salivary Gland.

INTRODUCTION

Fine needle aspiration cytology (FNAC) is a simple, inexpensive and atraumatic technique for the diagnosis of disease sites. The most obvious advantages of FNAC over surgical and large needle biopsy are that it is quicker to perform and report, less painful, less demanding technically and easily repeatable. The method is used for the evaluation of any palpable lesion, mostly in breast and in the head and neck region. However, modern imaging techniques enable the method to be extended to virtually any part of the body.[1]

The decision to operate on a salivary gland neoplasm is not usually based on the FNAC results because the presence of gross tumour alone is generally an indication for surgical removal. Nevertheless, FNAC can distinguish inflammatory from neoplastic conditions, lymphomas from epithelial malignancies and primary from metastatic tumours. Therefore, the information obtained from a pre-operative FNA can greatly aid in planning the nature and extent of the surgery.[2]

We have already discussed our experience with the FNAC of liver[3], breast[4] and thyroid[5] lesions. Here we describe our experience with the FNAC of major salivary glands lesions performed at Shaikh Zayed Postgraduate Medical Institute, Lahore.

MATERIAL AND METHODS

Because of the controversy among both surgeons and histopathologists as to the value and place of FNAC as a diagnostic tool in salivary gland lesions[6], the number of cases referred for FNA was relatively low and our experience was slow to accumulate. Since the establishment of our out patient FNA clinics in 1991 upto early 1996, we retrospectively retrieved a total of 70 cases of salivary gland FNAS. Patients were selected for

FNA on the basis of clinical examination. Most of the aspirates were performed by the pathologist in our FNA clinics. The standard procedure was to localize the lesion by palpation, inject local anesthesia and then aspirate the lesion, using 20 cc disposable syringe with a 21 gauge disposable needle. On average 3-5 smears were made from each aspirate, some of which were air dried while others were immediately fixed in 95% ethanol. Any remaining aspirated material in the syringe was used to prepare a clot for histological examination Where felt necessary a repeat FNA was performed to obtain an optimum specimen.

The air-dried smears were Giemsa stained. The ethanol fixed smears were stained with Papanicoloau stain, while the clot was formaline fixed, processed and Paraffin embedded. 4-5 um sections were cut and stained with Haemotoxylin and Eosin for histological examination.

RESULTS

A total of 70 patients with salivary gland lesions underwent FNA cytological examination. These included 41 (58.6%) male and 29 (41.4%) female patients. The mean age was 42.1 years with a range of 2½ to 80 years. Site-wise 40 (57.1%) aspirates were from the parotid gland and 30 (42.9%) were from the sub-mandibular gland. Table-1 summarises the cytological diagnosis in our study.

Table 1: Breakdown of the FNAC diagnoses of the salivary gland lesions in this study (n=70)

1.	Benign (n=44)	
	Pleomorphic adenoma	35
	Acinic cell tumour	01
	Benign cyst	03
	Abscess / Sialadenitis	04
	Granulomatous inflammation	01
2.	Malignant (carcinoma)	08
3.	Suspicious of malignancy	05
4.	Non-diagnostic	13

Pleomorphic adenoma was the most common diagnosis made in 35 (50%) patients. All these aspirates were cell rich and contained myxoid material. Small coloumnar epithelial cells with distinctly defined abundant cytoplasm and eccentric vesicular nuclei were arranged in well-polarized sheets, small groups and / or pseudo-glands with moderate to marked intercellular cohesion. The dense or patchy myxomatous segments contained isolated spindle cells and stellate cell groups, sometimes in semi-palisaded formation, pushed apart by the amorphous substance. The myxoid medium was pale pink or light green by Papanicoloau stain and bright pink / magenta color by Giemsa stain (Figs. 1 & 2)

Fig. 1: Pleomorphic adenoma - sheets of epithelial and myoepithelial cells with myxoid stroma (Giemsa Stain X 160).

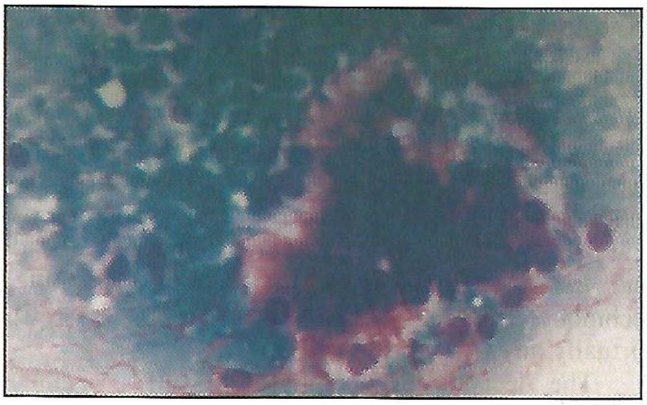

Fig. 2: Pleomorphic adenoma epithelial and myoepithelial cells with myxoid stroma (Giemsa Stain X 200).

Five (7.1%) cases had inflammatory lesions which included non-specific Sialadenitis, abscess and one case of granulomatous inflammation. This case revealed groups of epithelioid cells with necrotic debris and inflammatory cells in the background (Fig. 3.)

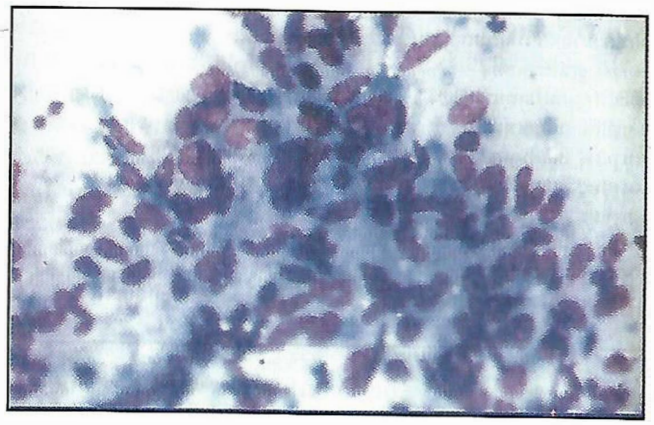

Fig. 3: Granulomatous sialadenitis - collection of epithelioid cells with scattered lymphocytes (Giemsa Stain X 200).

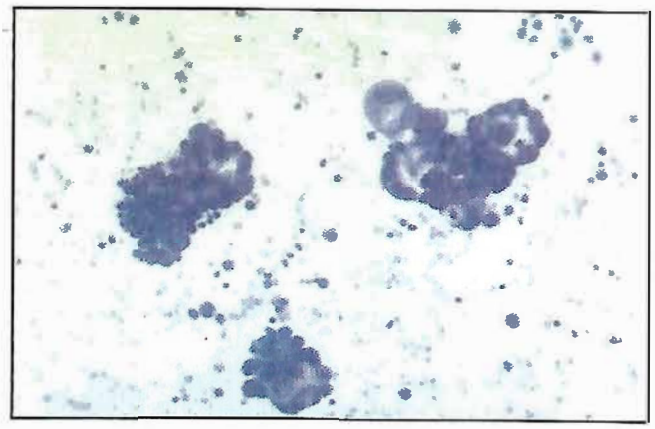

Fig. 4: Adenocarcinoma, submandibular salivary gland - cluster and acini of malignant glandular epithelial cells (Giemsa Stain X 200).

Eight (11.4%) patients were diagnosed as suffering from a malignant salivary gland tumour. All were reported as carcinomas with no further attempt at sub typing, although in 2 cases the possibility of a muco-epidermoid carcinoma was suggested. In these aspirates the cells resembled malignant squamous epithelial cells, containing intensely acidophilic or basophilic, homogenous cytoplasm. The nuclei were bounded by irregular nuclear membranes and had clumped chromatin and occasional macro-nucleoli. One case was reported as adeno-carcinoma with malignant cells forming acini (Fig.4)

Five (7.1%) cases were reported as suspicious of malignancy because of the very cellular aspirates and the presence of nuclear and cellular pleomorphism. Although the majority of the features were characteristic of pleomorphic adenoma. There were a few atypical cells with slight nuclear membrane irregularity or prominent nucleoli (Fig.5). Excision was advised in all these cases.

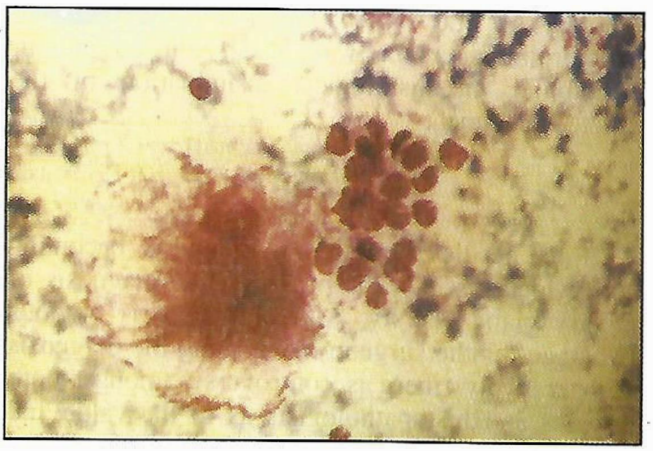

Fig. 5: Atypical cells - in pleomorpic adenoma with myxoid stroma (Giemsa Stain X 200).

Thirteen (18.6%) aspirates were considered as non-diagnostic. These aspirates were either scanty or showed only salivary gland acini, lacking any specific diagnostic features. Excision, if clinically indicated was advised in these patients.

Subsequently resected specimens were available for histological examination in 14 (20%) cases (Table - 2). The cytological diagnoses were accurate in 11 (78.6%) of these cases. One patient with a Warthin's tumour was mis-diagnosed as pleomorphic adenoma. One pleomorphic adenoma

Table 2: Correlation of the FNAC diagnosis with the histological diagnosis (n=14)

Sr. No	Age	Sex	Site	Fnac Diagnosis	Histological Diagnosis
1.	26	M	Parotid	Pleomorphic adenoma	Pleomorphic adenoma
2.	22	M	Sub-mandibular	Pleomorphic adenoma	Pleomorphic adenoma
3.	25	F	Parotid	Pleomorphic adenoma	Pleomorphic adenoma
4.	50	M	Parotid	Carcinoma ? Muco-epidermoid ? Squamous	Squamous cell carcinoma
5.	35	M	Parotid	Granulomatous inflammation	Tuberculosis (Z.N. positive)
6.	40	M	Parotid	Pleomorphic adenoma	Pleomorphic adenoma
7.	25	M	Sub-mandibular	Non-specific inflammation	Non-specific Sialadenitis
8.	17	F	Parotid	Pleomorphic adenoma	Pleomorphic adenoma
9.	30	M	Parotid	Pleomorphic adenoma	Pleomorphic adenoma
10.	50	F	Sub-mandibular	Pleomorphic adenoma	Pleomorphic adenoma
11.	47	F	Parotid	Pleomorphic adenoma	Pleomorphic adenoma
12.	70	M	Parotid	Pleomorphic adenoma	Warthin's tumour
13	60	M	Sub-mandibular	Pleomorphic adenoma	Chronic Sialadenitis
14.	45	F	Parotid	Non-specific (Scanty aspirate)	Pleomorphic adenoma

was missed due to the very scanty nature of the aspirate. In one patient an FNA diagnosis of pleomorphic adenoma was made, but no tumour was found on histological examination of the resected specimen.

DISCUSSION

Fine needle aspiration cytology is becoming more widely used in the pre-operative diagnosis of salivary gland lesions. Although there is obvious advantage for the surgeon in knowing the diagnosis pre-operatively, there is controversy amongst both surgeons and histopathologists as to the value and place of FNAC as a diagnostic tool bearing in mind that most salivary swellings are excised sooner or later.[6] The number of cases referred for FNAC was relatively low and our experience was slow to accumulate.

In our series, pleomorphic adenoma was the most frequent FNA diagnosis. This is not surprising as pleomorphic adenoma is the most common salivary gland tumour.[6,7] Also perhaps it is the most easily recognizable tumour cytologically.[2] However, in salivary gland tumours areas of diverse differentiation present diagnostic problems. Pleomorphic adenoma is a good example of diverse tumour differentiation. Foci of squamous metaplasia may be seen in pleomorphic adenoma, which, cytologically can be confused with a muco-epidermoid carcinoma.[6] Similarly, cellular and nuclear atypia may be present in these tumours, which may sometimes be of a marked degree and mis-diagnosed as a malignant lesion.[6,8] Because of the well known phenomenon of carcinoma developing in a pre-existing pleomorphic adenoma, we reported 5 cases as suspicious malignant with a background cytological features of pleomorphic adenoma. Unfortunately histological specimens were not available to refute or confirm our suspicion.

Despite identifying a lesion as malignant, no attempt to sub-classify the lesion was made in our series. This is the experience of other authors as well, although it is suggested that with increasing experience, the diagnostic accuracy of the pathologist will increase.[7]

One of the major diagnostic pitfalls is the cytological evaluation of cystic lesions of salivary gland. In addition to simple cysts, cystic degeneration is not un-common in Warthin's tumour, pleomorphic adenoma and muco-epidermoid carcinoma. Thus a false negative report of primary salivary gland tumours are often due to the yield of cystic fluid containing degenerate cells which are very difficult to interpret accurately.[9] Because of sampling error and the false negative reports that may follow, operation should not be

excluded in patients after negative reports when they have clinically suspicious lesions.[2]

CONCLUSION

Despite all the controversy surrounding the role of FNAC in salivary gland lesions, we were able to give a definitive diagnosis of either a benign (62.9%) or malignant (11.4%) lesion in 74.3% of our cases. Where subsequent histology was available most (78.6%) of our cytological diagnosis were proved correct. No false positive diagnosis of a malignant lesion was made. This reflects the value and importance of fine needle aspiration cytology in the evaluation of salivary gland lesions. The procedure is strongly recommended because it is accurate, easy to perform, painless and very cost effective.

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