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Fine Needle Aspiration Cytology in Salivary Gland Swellings- A Cross Sectional Study in a Tertiary Care Centre

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Abstract

Background: *Fine need aspiration cytology is the gold standard investigation in the work up of salivary gland tumors. This is one of the fast and cost effective investigations available. With the widespread availability of FNAC, the place of incisional biopsy is limited to only a few condition like direct skin infiltration and for minor salivary gland swellings. However, the interpretation of FNAC is subjective. We conducted this study to describe the pattern of FNAC findings in a cross section of patients diagnosed to have salivary swelling.*

Method: *This study was done in the department of surgery medical college, Trivandrum during 1996 to 1998. All patients presented with salivary gland swelling were included except those with a history of neck irradiation, recurrent swelling, pediatric patients and those with skin involvement. FNAC was done following a standardized procedure as described in literature. Thereafter smears were prepared and cytological features were studied. Basic demographic variables were collected for the study. Statistical analysis were carried out in graphpad Instat and R statistical software.*

Results: *There were 122 patients, 76(62.3%) being males. Most of the males were in the 30-60 age group. Polymorphic adenoma constituted the majority of the cytological diagnosis(29.5%). Of the total patients,104(85.2%) were treated surgically for various indications. The FNAC and histopathological features in the Post-operative specimen were comparable in most of the cases.*

Discussion: *We analyzed the pattern of cytological features of salivary gland swellings presenting in our institution in this study. Our study showed that the clinical features of benign tumors had a definite bearing on the final histopathological type and therefore can be used as a reliable guide for the preoperative diagnosis and treatment of salivary gland swelling. But for malignant swelling, the clinical features and the final histopathological diagnosis differed significantly. Our study has shown that fine needle aspiration cytology has a marked diagnostic significance in the management of salivary gland swellings. It improves the management of salivary gland swellings positively.*

Keywords: *salivary gland tumours, parotid tumours, pleomorphic adenoma,FNAC, histopathology, minor salivary gland swelling.*

Introduction

Fine needle aspiration is considered as reliable investigation in the workup of salivary gland tumors[1,2]. This investigation is rapid, cost effective and widely available[3,4]. Fine needle aspiration cytology has proved to be a very important

diagnostic tool in salivary gland swellings[5-7]. Place of open biopsy is reduced to a minimum on these days[8,9]. FNAC is more acceptable to the patient, surgeon and the pathologist because of its easy technique, reliability, less morbidity, less cost and low incidence of complication[10,11]. As a result, the incisional biopsy is done less frequently except for those case with skin infiltration and in swelling from minor salivary glands[12-14]. However one of the issues associated with use of fine needle aspiration biopsy is the inability of the cytology to distinguish between some benign and malignant pathologies. The differentiation factor in these condition depends solely on the capsular and vascular invasion. Except for this conditions, fnac is of valuable help in the initial work up of salivary gland tumours.

Swelling from parotid and other salivary gland often pose a diagnostic challenge to the attending surgeon.[15,16]. The therapeutic approach is varied depending on the pathology of the lesion ranging from conservative methods, different types of thyroidectomy to chemo radiation[17-19]. Against this context, a preoperative histological or scatological diagnosis is imperative in the treatment planning for the patient[20-23]. Radiation and chemotherapy play a significant role in the control and palliation of malignant tumours of the salivary glands[24-26]. Hence a definite pre-operative diagnosis will help the surgeon to plan the management of the patient more effectively.

We conducted this study to describe the pattern of FNAC findings in patients attending surgery outpatient clinic and those admitted for surgery in our institution, a tertiary care referral hospital and teaching institute with the catchment from the southern districts of kerala and Kanyakumari.

Materials and Methods

We conducted this study in the department of surgery medical college Trivandrum during the period of two years from march 1996 to march 1998. Informed consent was taken from every patient before enrolling into the study.

We enrolled 122 consecutive patients into this study. A formal sample size calculation was done before conducting the study. We recruited patients above the age of 12 years. We excluded patients with history of neck irradiation. Moreover we excluded patients with recurrent swellings and those with skin involvement.

A detailed history and clinical examination was done and a clinical diagnosis reached. FNAC was done. Fine needle aspiration cytology was done in all case with clinically palpable swelling or with finding suggestive of lesion in ultrasound or CT. Smears were collected in the cytology laboratory. The instruments for aspiration consisted of a 10 ml disposable syringe filled with a 22G or 23G needle[27-30]. The skin at the site was wiped with an antiseptic and the suspected salivary gland swelling was held with one hand in a favourable position. No anaesthesia was used. The needle was introduced into the swelling and the plunger of the syringe withdrawn as far as possible creating a vacuum in the system. The needle was moved back and forth in a straight line to obtain sufficient material. Throughout the procedure negative pressure was maintained by retracting the plunger of the syringe. When the aspiration was complete, the pressure in the syringe was allowed to equalize before the needle was withdrawn. The syringe was disconnected from the needle, filled with air and reconnected. The contents were expressed onto a glass slide and spread along the slide with the needle itself.

The smears with benign ductal and acinar cells in a background of polymorphs or lymphocytes or histiocytes. The diagnosis of acute sialadenitis was considered when polymorphs were predominant and of chronic sialadenitis when mononuclear cells were predominant. Other diagnosis like pleomorphic adenoma, wartthin's tumour, monomorphic adenoma, adenoid cystic carcinoma, mucoepidermoid carcinoma, acinic cell carcinoma were arrived at using standard cytological features described in literature.

The variables included in the study were basic demographic variables, various cytological characteristics and fnac diagnosis, clinical diagnosis, history, examinations findings, sonological findings and CT findings.,

All data related to cytological examination, history, clinical examination, investigations were entered in to a pretested case report form. It was later abstracted into an excel based database. Patients were treated as per the results of the fnac. Most of the patients were offered surgical treatment.

Two pathologists separately assessed the fnac specimen.

All statistical analysis were done in graphpad instat and R statistical software. Descriptive statistics were summarised with mean and standard deviation or frequencies and percentages.

Results

Out of the 122 patients who underwent fine needle aspiration and included in this study, 76(62.3%) were males and 46(37.7)% females. Most of the males were in the 30-60 age group and females in 20-50 age group. The youngest patient was 14 years old and oldest 72 years (table 1).

Table 1 Distribution of patients as per age and sex.

Age group(n=122)	Male(76)	Female(46)
11-20	8	2
21-30	11	12
31-40	14	13
41-50	13	7
51-60	15	8
61-70	12	4
71-80	3	0

FNAC results showed pleomorphic adenoma as the predominant cytological diagnosis with 36(29.5%) patients, followed by chronic sialadenitis in 32(26.2%) patients (table2). In this study, out of the 122 patients who underwent FNAC,104(85.2%) were treated surgically. Twelve patients were treated conservatively. We could not follow up 4 patients. In addition, two patients refused surgery. The FNAC result of these cases and corresponding histopathological reports are shown in table2.

Table 2 Cytological and histopathological features

diagnosis	FNAC N=122	HISTOPATHOLOGY N=104
Chronic sialadenitis	32 (26.2%)	31(29.8%)
Pleomorphic adenoma	36(29.5%)	35(33.6%)
Warthin's tumour	13(12.3%)	13(12.5%)
Monomorphic adenoma	1(0.8%)	1(0.9%)
Mucoepidermoid tumour	12(9.8%)	10(9.2%)
Acinic cell carcninoma	1(0.8%)	2(1.9%)
Squamous cell carcinoma	1(0.8%)	1(0.9%)
Inconclusive/others	24(19.7%)	8(7.6%)
Adenoid cystic carcinoma	0	1(0.9%)
Carcinoma in pleomorphic carcinoma	0	2(1.9%)

FNAC was correct in most of the benign and malignant diseases. however there were more inconclusive cases in FNAC compared to histopathological findings.

Discussion

In this study, we analyzed the pattern of cytological findings in patient presenting in our institution with swelling arising from salivary gland and compared those finding with the post operative histopathological reports. Preoperative assessment of the nature of the swelling and differentiation into benign and malignancy pathology is of importance with regard to treatment planning. The result vary across different centers due to the subjective nature of identification and documentation of cytological features. In our study, it was found that the clinical features of the benign tumours had definite bearing on the final histopathological type and therefore a reliable guide for the preoperative diagnosis and treatment of parotid tumours. But for malignant tumours clinical features and the final histopathologic diagnosis differed widely.

There was a male predominance in our study. This compares with the studies by Vuhahula et al and other studies in the literature[31]. in our study, polymorphic adenoma constituted about 33 percent of cytological diagnosis. This compares with other studies reported in the literature.

Even though, rare complications like small haematomas infection, facial nerve damage,

implantation of tumor cells, or other complications have been reported, there were no complications in the series. Other studies are also in agreement with this[32,33].

Most of the chronic sialadenitis and pleomorphic adenoma and other benign tumors were diagnosed correctly in our study. Histopathological results were in agreement with the FNAC findings in patients who underwent surgical treatment.

FNAC is very much useful in the diagnosis of clinically unsuspected or clinically questionable salivary gland tumours. With the application of FNAC, it is possible to differentiate between tumours of lower pole of parotid gland and upper deep cervical lymph nodes or bronchiogenic cysts. Enlargement of submandibular salivary gland is possible to differentiate from enlarged submandibular lymph nodes. It also help to differentiate between inflammatory conditions and salivary gland tumours.

The prime role of FNAC, is as a diagnostic tool that helps in the evaluation of salivary gland masses and not as a histologic procedure on which operative decisions can be wholly based on. Other diagnostic modalities which help to differentiate between benign and malignant salivary gland tumours include sialography, CT scan and CT sialography. But these modalities are expensive.

The danger of seeding of tumour cells in the needle tract or in the puncture site remains a matter of concern. Engzell et al.'6 found no recurrence involving the skin or the site of fine needle aspiration. Frable[21] also did not find any implantation in his study series. Dissemination of tumour cells by vascular channels is a potential danger. But practically it is not seen (Young et a1). Moreover the potential danger of seedling is practically nil with current use of smaller caliber needle in vogue[34].

The decisions regarding the need for facial nerve sacrifice depend up on the clinical findings, preoperative findings and the extent of tumour. But if the cytological report gives suspicion of malignancy, it may help both the surgeon and the patient, mentally prepare for the possibility of sacrificing facial nerve. The surgeon can also think of the rehabilitative measures with the nerve graft. (Shaha et al", Rodriguez et al").

In cases where a malignant lesion is suspected clinically (based on pain of the swelling, rapid growth of the tumour, and on examination hard and nodular swelling with or without facial nerve involvement), an FNAC is done. If the FNAC is positive for malignancy, then a radical procedure may be done. But, if FNAC done is negative for malignancy, then the FNAC should be repeated. If the repeated FNAC also turned out to be negative, then the surgical option should be restricted to superficial parotidectomy or submandibular sialadenectomy.

Fine needle aspiration cytology has marked diagnostic significance in management of salivary gland swellings. It improves the management of salivary gland swellings positively.

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