

FINE NEEDLE ASPIRATION CYTOLOGY OF ORAL LESIONS

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ABSTRACT

This study was carried out to introduce the use of fine needle aspiration cytology for the early and quick diagnosis of oral lesions. All patients were referred to a private clinic for Fine Needle Aspiration Cytology by Dental Surgeons.

A total number of 86 patients were included in this study. These patients had a mass in oral cavity, in salivary glands or in submental / submandibular area. The duration of study was two years, from January 2010 to December 2012. Fine needle aspiration was done and smears were made for cytopathological diagnosis. All patients were followed up and a biopsy report was obtained for correlation.

Age range was 1-85 years. Mean age being 39 years. Lesions were equally distributed between male and female patients. Out of 86 patients majority n=27 (31.3 %) presented with a parotid mass, n=18 (20.9%) presented with a submandibular mass, n=14 (16.2 %) had cheek swelling and n=11 (13.6%) had a mass on mandible. Cytopathological analysis showed an equal frequency of benign and malignant tumors n=30 (34.8%) each, n=18 (20.9%) were inflammatory lesions and n=8 (9.5%) non-neoplastic non-inflammatory lesions. Out of 30 benign tumors most common was Pleomorphic Adenoma n=24 (80%) arising in Parotid, out of 30 malignant tumors most common was Squamous cell carcinoma n=22(73.3%). Out of 18 inflammatory lesions most were either tuberculosis or abscess n=7 (38.8%) each. Histopathological diagnosis was available in 50 patients. Overall accuracy for diagnosis of malignant tumors and inflammatory lesions was 100%, for benign tumors it was 92 % and for non-inflammatory non-neoplastic lesions it was 33.3 %.

Fine needle aspiration is a very useful, cost effective, quick and painless procedure for early diagnosis of oral lesions and in many cases obviates the need for incisional / excisional biopsy.

Key Words: Fine needle aspiration cytology, Oral lesions, cost effective, early diagnosis.

INTRODUCTION

Fine Needle Aspiration Cytology (FNAC) is a technique whereby cells are obtained from a lesion using a thin bore needle and smears are made for cytopathological diagnosis.¹ This technique is based on the fact that tumor cells are less cohesive and are easily aspirated. Numerous studies have been carried

out using this technique for the diagnosis of breast lumps² thyroid nodules³, Lymph nodes⁴, liver diseases⁵ and subcutaneous soft tissue masses.⁶ FNAC is also being widely used for the diagnosis of oral lesions in developed countries.⁷ A number of studies are available in the literature showing efficacy for the diagnosis of oro-pharyngeal lesions⁸, jaw bones⁹, salivary glands,^{10,11} oral Cancer¹² and oral soft tissues.^{13,14} Its use is not well established for the diagnosis of oral lesions in Pakistan especially lower Sindh. This study was carried out to assess the efficacy of Fine Needle Aspiration Cytology for the diagnosis of oral lesions and to establish it as a useful, quick, cost effective method for early diagnosis of oral lesions in our set up.

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METHODOLOGY

A total of 86 patients were included in this study. All patients were referred to a private FNAC clinic by dental surgeons of Liaquat University of Medical and health sciences and private dental surgeons. The duration of study was two years from January 2010 to December 2012. A detailed history and clinical examination findings were recorded on a printed Proforma. Fine needle aspiration cytology was carried out by intraoral or extraoral approach after application of local anesthetic. A 10ml. syringe with 21G needle was used for aspiration. The material was expressed on glass slides and four smears were prepared and fixed in spirit immediately. After one hour all smears were stained using Hematoxylin and Eosin stain and also Papanicolaou stain. A cytopathological diagnosis was made and report was prepared on the same day. The fine needle aspirates were categorized into Non-inflammatory Non-Neoplastic, Inflammatory, Benign and Malignant tumors. Frequency of various lesions were tabulated. Demographic details of the patients were also tabulated. All patients were followed up and Histopathological reports were obtained for correlation.

RESULTS

AGE DISTRIBUTION (Table 1)

The age range was 1-85 years. Mean age was 39 years. The youngest patient was 1 year old, presented with a maxillary swelling which was diagnosed as an abscess on fine needle aspiration cytology. The oldest patient was 85 year old, who presented with a large mandibular mass, diagnosed as Squamous Cell Carcinoma on FNAC. Maximum number of patients n=25 (29%) were between 41-50 years of age.

SEX DISTRIBUTION

The incidence of oral lesions was equal in males and females. Out of 86 patients n=43 (50%) were males and n=43(50%) were females.

DISTRIBUTION ACCORDING TO SITE (Table 2)

Most common site was mass at parotid area n=27 (31.3%) followed by mass at submandibular area n=18 (20.8%). Third common site was cheek mass n=14 (16.2%). Other less common sites included lower Jaw,

Maxilla, tongue, floor of the mouth, lip, submental area, molar area and palate. Their frequencies are presented in a chronological order in Table 2.

TABLE 1: DISTRIBUTION ACCORDING TO AGE
N= 86

Age Group	No. of patients	Percentage
0-10	06	7.0%
11-20	08	9.3%
21-30	12	14.0%
31-40	18	21.0%
41-50	25	29.0%
51-60	12	14.0%
61-70	04	04.6%
71-80	00	00%
81-90	01	1.1%
Total	86	100%

TABLE 2: DISTRIBUTION ACCORDING TO SITE:
N=86

Site of Lesions	No. of Cases	Percentage
Parotid mass	27	31.3 %
Submandibular Mass	18	20.8 %
Cheek	14	16.2 %
Lower Jaw	11	13.6 %
Maxilla	04	4.6 %
Alveolar area	03	3.4 %
Tongue	03	3.4 %
Submental swelling	03	3.4 %
Floor of the mouth	01	1.1 %
Molar area and palate	01	1.1 %
Lip	01	1.1 %
Total	86	100

TABLE 3: DISTRIBUTION ACCORDING TO FNAC
DIAGNOSIS OF ORAL LESIONS: N=86

Diagnosis on FNAC	No. of cases	Percentage
Malignant Figures – 1 & 2	30	34.8%
Benign Figures - 3 & 4	30	34.8%
Inflammatory Figures -5,6,7,8	18	20.9%
Non-Inflammatory, Non-neoplastic	08	09.5%
Material Inadequate for Diagnosis	00	00%
Total	86	100

TABLE 4: TYPES OF MALIGNANT TUMORS REPORTED ON FNAC: N=30 (FIGURE: 1 & 2)

Malignant Tumors	No. of cases	Percentage
Squamous cell Carcinoma	22	73.3%
Carcinoma arising in	04	13.3%
Pleomorphic Adenoma		
Lymphoma	01	3.3%
Small Cell Carcinoma	01	3.3%
Adenocarcinoma	01	3.3%
Adenoid Cystic Carcinoma	01	3.3%
Total	30	100

TABLE 5: TYPES OF BENIGN TUMORS REPORTED ON FNAC: N=30 (FIGURE: 3 & 4)

Benign Tumors	No. of Cases	Percentage
Pleomorphic Adenoma (Figure-4)	24	80%
Fibrolipoma	03	10%
Hemangioma	01	3.3%
Ameloblastoma	01	3.3%
Warthin Tumor	01	3.3%
Total	30	100

TABLE 6: TYPES OF INFLAMMATORY LESIONS ON FNAC: N=18 (FIGURES: 5-8)

Inflammatory Lesions	No. of Cases	Percentage
Tuberculosis (Figure-8)	07	39.0%
Abscess (Figure-6)	07	39.0%
Pyogenic Granuloma	02	11.0%
Giant cell Reparative Granuloma	02	11.0
Total	18	100

TABLE 7: TYPES OF NON-INFLAMMATORY NON-NEOPLASTIC LESIONS ON FNAC : N=08

Non-inflammatory, Non-neoplastic Lesions	No. of Cases	Percentage
Mucous Retention Cyst	03	37.5%
Epidermal Inclusion Cyst	03	37.5%
Radicular Cyst	01	12.5%
Sjogren Syndrome	01	12.5%
Total	08	100

TABLE 8: FNAC DIAGNOSIS VS HISTOLOGICAL DIAGNOSIS N=50

Dignosis on FNAC	No. of cases	Histological diagnosis	Accuracy%
Malignant Tumor	20	20	100%
Benign Tumor	25	23	92%
Inflammatory Lesion	04	04	100%
Non-Inflammatory, Non-Neoplastic Lesion	01	03	33.3%
Total	50	50	

DIAGNOSIS ON FNAC

Out of 86 patients n=30 (34.8%) were benign tumors and a similar number of malignant tumors were reported on FNAC while 18 (20.9%) were reported inflammatory lesions and n=8 (9.3%) were non-inflammatory and non-neoplastic lesions. These are shown in a chronological order in Table 3. The types of benign tumors, malignant tumors, inflammatory lesions and non-inflammatory non-neoplastic lesions are shown in Tables 4, 5, 6 & 7. Most common malignant tumor was Squamous cell carcinoma n=22 (73.3%), most common benign tumor was Pleomorphic Adenoma n=24 (80%), most common inflammatory lesions were Abscess and Tuberculosis each n=7 (39%). Most common non-inflammatory non-neoplastic lesion was Mucus Retention cysts and Epidermal Inclusion cysts n=3 (37.5%) each.

HISTOPATHOLOGICAL DIAGNOSIS

Histopathological diagnosis was available in 50 patients. All 20 lesions diagnosed malignant tumor on cytology were also malignant on histopathology of biopsy specimens. Of the 25 lesions labeled benign tumor on cytology 23 were benign tumors while two were periodontal cysts on histopathology. 04 lesions were inflammatory on FNAC, all proved to be inflammatory on histopathology. The non inflammatory non-neoplastic lesions were cystic lesions with fluid aspirates, cytology showed one lesion to be non-inflammatory non-neoplastic while biopsy showed three lesions belonging to this group.

DISCUSSION

Many studies are available in literature where FNAC has been carried out on Oropharyngeal lesions⁸, Jaw lesions^{9,15}, Salivary gland masses¹⁰, oral soft tis-



Fig 1: Growth Tongue, Female (50 years)



Fig 5: Cheek Mass Male Child (12 years)

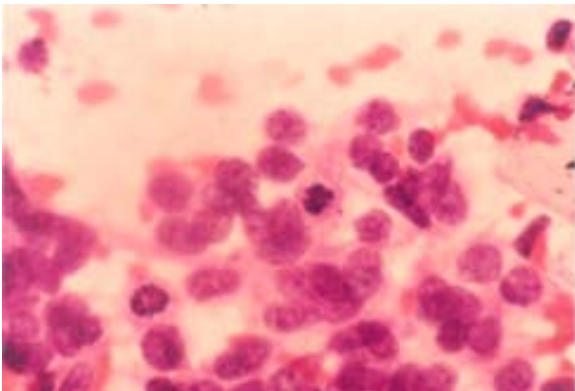


Fig 2: FNAC Smear showing poorly differentiated carcinoma

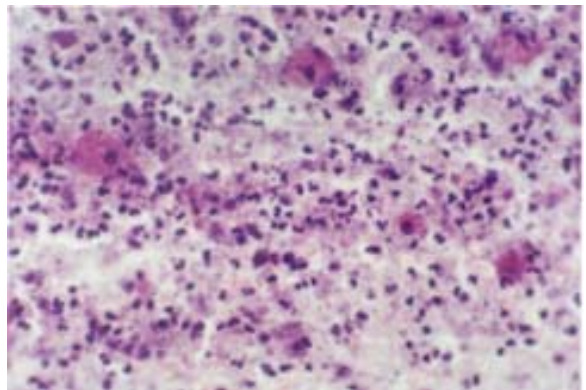


Fig 6: FNAC Smear showing Suppurative Inflammatory Exudate (Dx. Abscess Cheek)



Fig 3: Female 45 with mass on left cheek.



Fig 7: Swelling Tongue Female 50

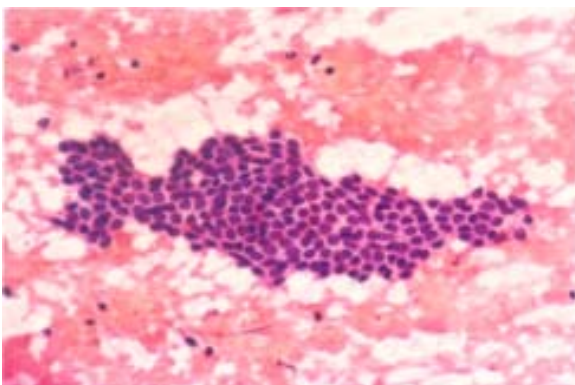


Fig 4: FNAC Smear showing benign epithelial cells (Dx. Pleomorphic Adenoma)

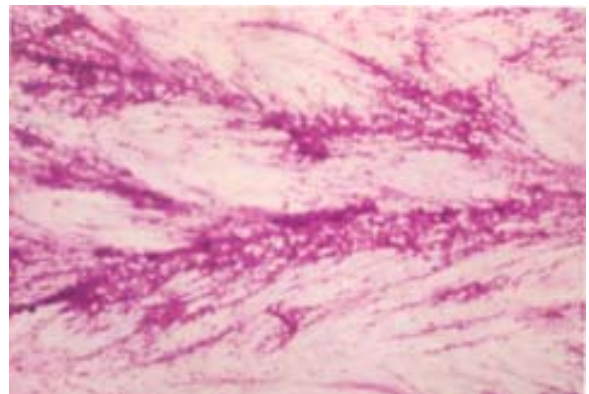


Fig 8: FNAC Smear showing Caseous Material (Dx. Tuberculosis)

sues.¹³ In Pakistan only one study is available which was carried out to assess the efficacy of FNAC for the diagnosis of oral squamous cell carcinoma.¹¹ Our study shows an analysis of all oral lesions clinically presenting as a mass at intraoral or extra oral locations (lips, maxilla, mandible, salivary glands and submental or sub mandibular areas). Fine needle aspirates can also be used for immunocytochemistry.¹⁶

Our study shows the most common site as cheek (16.2%) while another study² shows tonsil as the most common site. Results on FNAC in our study show an equal frequency of benign and malignant tumors (34.8% each) while in the literature a similar frequency has been reported.² Most common malignant tumor reported in the literature is squamous cell carcinoma.¹¹ Our study also shows similar result. Another study⁵ carried out on Fibrous and Non –Fibrous lesions of oral cavity describes a better diagnostic efficacy for non-fibrous lesions. Our study shows adequate material in all cases and such problem was not encountered. Many studies have been carried out to assess the sensitivity and specificity of FNAC by correlating it with open biopsy. International reports^{6,10} show a sensitivity of 93% and a specificity of 100%. A study carried out in Pakistan¹¹ shows a positive correlation of 50%. Our study shows an accuracy of 100% for the diagnosis of malignant tumors and inflammatory lesions. While with benign tumors the accuracy was 92%. The accuracy for non-inflammatory non-neoplastic lesions was 33.3%. This is because of the fluid aspirates and hypocellularity of the material.

Oral cavity is a site where mucosa is very vascular and an open biopsy leads to a lot of bleeding which is difficult to control. Moreover when a biopsy is taken from a large mass with necrotic surface the Histopathological diagnosis is usually inconclusive. Many patients in lower sindh have limited mouth opening and a biopsy is not possible. In recent times FNAC solves these problems. Adequate material can easily be obtained by using a 10 ml. syringe from an intraoral or extraoral site without any discomfort to the patient and with no bleeding. A biopsy report is available in 7-10 days while FNAC report is prepared within 24 hours of sampling. It gives early, quick, cost effective information to the surgeon about the type of lesion he is dealing with. In some cases a subsequent surgery is not needed and patient can be put on appropriate treatment.

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