



ORIGINAL RESEARCH PAPER

General Surgery

VALUE OF FNAC IN THE DIAGNOSIS OF PAROTID GLAND TUMORS AND ITS CORRELATION WITH BIOPSY

KEY WORDS: FNAC, Biopsy, Parotid.

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ABSTRACT

Aim : The aim of this study is to identify the value of FNAC and to correlate its relation with BIOPSY post operatively.

Materials and methods : This study was conducted from August 2014 to July 2016, over a period of 2 years. 30 patients admitted in the department of general surgery and surgical oncology presenting with complaints of either swelling in the parotid region or any other complaint related to the parotid tumor at NRIMC & GH were included in the study. This is a prospective study. All the patients were subjected to FNAC preoperatively and underwent surgery. The specimen was sent for HPE and correlated with FNAC.

Results : Overall pleomorphic adenoma, constituted 70% of the tumours and among malignant tumour, muco epidermoid carcinoma constituted 13% of the tumours in the series. Among the 30 cases 28 were proven to be benign by FNAC and 2 malignant. In contrast HPE has proven three other cases as malignant which were shown benign on FNAC.

Conclusions : Benign tumours of the parotid constituted about 83.33% and malignant tumours constituted 16.67% of the parotid neoplasms. FNAC was done in all patients. The overall accuracy of FNAC was 89.2%, which is comparable to western literature .The sensitivity and specificity in the present study is 40% & 100% respectively. The PPV is 100%. The NPV is 89.28%.

INTRODUCTION

The analogue of the parotid gland is the first gland to form in humans. Lesions of the parotid gland are fairly easy to recognize mainly because of the location and limited number of structures present here.

Salivary gland tumours are less commonly encountered in surgical practice and constitute 3% of all head and neck tumours. About 70 – 80% of the salivary gland neoplasms occur in parotid gland.^{1,2} The incidence of parotid gland tumours is between 1-3 / 1, 00,000 per year. About 80% of parotid masses are benign neoplasms³ and the rest are malignant. 80% of benign tumours constitute pleomorphic adenoma occurring between the fourth and sixth decades of life.⁴

The parotid gland has a superficial lobe, lateral to the facial nerve, that comprises 4/5 of the glandular parenchyma, and a smaller deep lobe. 80 % of parotid tumours are located in the superficial lobe and most of them are benign. Deep lobe neoplasms are considered to have a greater incidence of malignancy. Pleomorphic adenoma is the most common benign tumor of the parotid followed by warthins tumor. The most prevalent malignant tumor is the mucoepidermoid carcinoma, followed by adenoid cystic carcinoma.

The first diagnostic imaging assessment for parotid tumors is usually ultrasonography, but this assessment does not determine the indication for surgical treatment. Fine needle aspiration (FNA), whether or not guided by ultrasound, can be used as a complementary diagnostic test. Fine needle aspiration (FNA) biopsy plays an important role in the work-up of parotid masses, especially when a neoplastic process is suspected. FNA may be used to distinguish between neoplastic and nonneoplastic processes.⁵ Before any surgical planning, a FNA biopsy is instrumental in obtaining a tissue diagnosis. Part of the challenge of obtaining an accurate diagnosis is that a parotid mass is heterogeneous in content, and that tumor may not always be sampled within a given pass of the needle. Ultrasound-guided biopsies can improve the likelihood of an accurate biopsy, and may be useful for deeper tumors.^{6,7} A systematic review and meta-analysis on the diagnostic accuracy of FNA for benign parotid neoplasms reported high sensitivity (96%) and specificity (98%), and high positive (100%) and negative (81%) predictive value.⁸ For malignancies, the sensitivity and specificity were lower, at 79%

and 96%, respectively.

AIM OF THE STUDY

To identify the value of FNAC and compare the FNAC of parotid tumour with the BIOPSY post operations.

MATERIALS AND METHODS

This study was conducted from August 2014 to July 2016, over a period of 2 years. After approval from the ethical committee a written informed consent was obtained from the patients. 30 patients admitted in the department of general surgery and surgical oncology presenting with complaints of either swelling in the parotid region or any other complaint related to the parotid tumor at NRIMC & GH were included in the study.

All patients admitted with a swelling in the parotid region were evaluated by documenting the history, thorough clinical examination, routine laboratory investigations and specific investigations after taking written and informed consent. In history, importance was given to presenting complaints, duration of lump, rapid increase in size, associated symptoms of facial nerve involvement, previous surgical treatment or any medical problem. Regarding physical examination, importance was given to the site, extent of the tumour, deep lobe enlargement and fixity to the surrounding structures, facial nerve involvement and regional lymphadenopathy.

Specific investigations like FNAC, USG neck were done for all patients in the study group. After evaluation of the tumour by clinical examination and specific investigations, a surgical plan was formulated. The final decision was taken per operatively by the surgeon. The specimen was sent for histopathology for final diagnosis and tumour typing.

Data was computed in an Excel spreadsheet and classified as variables of the analysis, which in turn were classified as qualitative, with a numerical scale code, or as quantitative.

RESULTS

Following observations were made in 30 patients who presented with parotid gland neoplasms in this study.

Table 1: Incidence of benign and malignant parotid tumours

SL.NO	INDIVIDUAL TUMORS	NO OF PATIENTS	%
1	Pleomorphic adenoma	21	70
2	Warthin's Tumour	2	6.67
3	Basal cell Adenoma	1	3.33
4	Muco epidermoid carcinoma	4	13.33
5	Adenoid cystic carcinoma	1	3.33
6	Canalicular adenoma	1	3.33

Overall pleomorphic adenoma, constituted 70% of the tumour and among malignant tumour, muco epidermoid carcinoma constituted 13% of the tumours in the series.

FNAC & HISTOPATHOLOGY :

All 30 cases were subjected to FNAC and reported as parotid tumours. After surgical excision or biopsy, all specimens were studied histopathologically and the table below shows co-relation between FNAC reporting and histopathological diagnosis.

Table 2 : Correlation of FNAC with histopathological examination

DIAGNOSED AS BENIGN		DIAGNOSED AS MALIGNANT	
FNAC	BIOPSY	FNAC	BIOPSY
28	25	2	3

DISCUSSION

Knowledge in parotid tumors is an essential tool for the surgeon at the time of diagnosis and treatment. The scientific literature includes some institutional experience in this matter, with most results indicating that benign tumors are the most frequent and superficial parotidectomy is the most common surgical procedure for benign tumors and total conservative parotidectomy for malignant tumors.

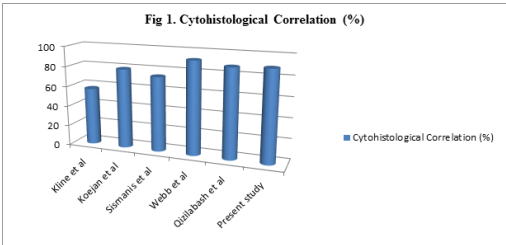
VALUE OF FNAC:

The value of fine-needle aspiration cytology (FNAC) for diagnosis of parotid gland lesions is controversial. FNAC obviates the need for surgery in up to 33% of patients^{9,10,11,12} and can provide useful information for surgical planning^{13,14}; however, the clinical usefulness of FNAC is questioned because of low sensitivity. While FNAC is now a commonplace procedure, some authors, such as Batsakis et al,15 have suggested that FNAC is only cost-effective in limited circumstances. A systematic review and meta-analysis on the diagnostic accuracy of FNA for benign parotid neoplasms reported high sensitivity (96%) and specificity (98%), and high positive (100%) and negative (81%) predictive value.16 For malignancies, the sensitivity and specificity were lower, at 79% and 96%, respectively.16

The safest and the most acceptable means of diagnosis is FNAC, though complete surgical excision and histopathological examination was the final court of trial. In this series, FNAC was carried out in all cases.

Table 3 : Comparison of FNAC and HPE

Source	No. of Patients	Histology (FNAC)	Accuracy Benign from Malignant (%)	Exact overall Cytohistological Correlation (%)	Exact Cytohistological Correlation in malignancies (%)
Kline et al	69	50	96	57	56
Koejan et al	52	29	86	79	83
Sismanis et al	51	51	91	74	60
Webb et al	66	50	98	92	92
Qizilabash et al	160	101	98	88	79
Present study	30	30	100	89.2	40



In this study FNAC correctly diagnosed benign from malignant in 91.3% of the cases. The exact cytohistological correlation in case of malignancy was 40%. The exact overall cytohistological correlation was 89.2%, which is comparable to western literature. In the series by McGurk & K. Hussain et al, the ability to distinguish benign from malignant parotid gland tumour was 93%, but the definitive histological diagnosis could be established in 77% of the cases. In the series by JMH Debeto & JJK Munting, the accuracy of FNAC was 74% for overall parotid tumour and 81% for pleomorphic adenoma. The role of cytological analysis achieved through FNAB, in cases with suspected malignancy, is still debated and has already been investigated by Bussu F, Parrilla C, Rizzo D, Almadori G, Paludetti G, Galli J. group.17 Some authors objected that it never modifies the clinical attitude because of its low sensitivity (relatively high rate of false negatives). This is not completely true, and, in their opinion, FNAB can often be helpful:

- when it is positive, it almost confirms the suspicion of malignancy (high specificity) and allows not only to plan the surgical procedure and possibly a reconstructive procedure on the facial nerve, but, most of all, to obtain an adequately informed consent regarding management of the facial nerve;
- when surgery is not indicated due to the characteristics not only of the patient (poor general conditions), but also of the tumour (disseminated disease), making a diagnosis by FNAB of the parotid lesion can be important;
- if the FNAB report reveals or suggests lymphoma, the diagnostic and therapeutic path changes radically and parotidectomy may be avoided.
- However, their series, as told by them which includes only patients who underwent surgery, is not an adequate model for the evaluation of the effectiveness of FNAB, the most useful role of which is to offer the possibility to avoid surgery.17

Table 4 : Comparison of value of FNAC in benign & malignant tumors

S. No	Study	Total no of patients	FNAC		
			Benign	Malignant	Inconclusive
1	Al Salamah SM	37	28	5	4
2	Uğuz MZ et al	29	21	6	2
3	Present study	30	28	2	0

Fine-needle aspiration diagnosed the pathology in 33 out of 37 lesions in the study conducted by Al Salamah SM and colleagues¹⁸ in the teaching hospital in 2005. Pleomorphic adenoma was the commonest pathology observed in 24 patients (64.9%). Warthin's tumour was more common among male patients and was the only pathology with bilateral involvement. Malignant tumour was found in five patients (13.5%). The present study diagnosed 28 tumors as benign and 2 as malignant. In contrast to FNAC histopathology confirmed 25 tumors as benign and 5 as malignant.

Table 5 : Sensitivity and specificity of FNAC

Study	No of patients	Sensitivity	Specificity	PPV	NPV
Deneuve S et al	78	63.6%;	100%.	100%;	94.4%;
Uğuz MZ et al	29	54.6%	100%	---	---
Present study	30	40%	100%	100%	89.28%

In another study conducted by Deneuve S et al during the year 2009, 78 patients underwent FNAC. Positive predictive value for malignancy was 100%; negative predictive value 94.4%; sensitivity 63.6%; specificity 100%.¹⁹

The study conducted by U uz MZ, Onal HK, Ero lu OO, Etit D²⁰ included 29 patients (15 males, 14 females; mean age 52 years; range 20 to 83 years) who underwent FNAB and parotidectomy for parotid masses. The results of FNAB were reported as benign in 21 patients (72.4%), malignant in six patients (20.7%), and suspicious in two patients (6.9%). Postoperative histopathologic diagnoses were reported as benign in 17 patients (58.6%) and malignant in 12 patients (41.4%). The sensitivity and specificity rates for FNAB were 54.6% and 100%, respectively. The most common histopathological diagnosis was pleomorphic adenoma (n=7, 24.1%), followed by mucoepidermoid carcinoma (n=4, 13.8%), and Warthin's tumor (n=3, 10.3%).²⁰ The sensitivity and specificity in the present study is 40% & 100% respectively. The PPV is 100%. The NPV is 89.28%.

CONCLUSION

Benign tumours of the parotid constituted about 83.33% and malignant tumours constituted 16.67% of the parotid neoplasms in the present study of which 28 cases were diagnosed by FNAC. The overall accuracy of FNAC in this study was 89.2%, which is comparable to western literature.

LIMITATIONS

This is not a study without limitations. The study sample is less compared to other western studies. The exact sensitivity and specificity of FNAC can be determined when a large cohort is studied.

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