



Original Article

ROLE OF FNAC IN EVALUATION OF PAROTID GLAND SWELLING

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Abstract

Introduction: Salivary gland tumour are uncommon, representing less than 6% of head and neck neoplasm.

Objectives: To find out the histological types of parotid neoplasm and to correlate the findings of FNAC and final histological report in parotid gland neoplasm.

Methods: A total 30 cases were studied from the inpatient departments of General Surgery and Otolaryngology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka since July, 2011 to April, 2013. Fine Needle Aspiration Cytology (FNAC) was done in all cases and compared with histopathology finding of postoperative specimen.

Result: Regarding sex distribution benign neoplasm in female 13 (56.52%) and in male 10(43.47%). As to the malignant parotid neoplasm in female 4(57.14%) and in male 3(42.85%). All parotid neoplasm male: female ratio 1:1.3. Two cases involved in deep lobe of parotid & presented with inward and forward bulging of tonsil and pillars. Three cases of warthin's tumour only presented with swelling in the tail of parotid gland. In this series out of 30 cases of parotid neoplasm 23 (76.66%) cases were benign and rest 07 (23.33%) were malignant. Pleomorphic adenoma was the most common benign neoplasm 20 (66.66%). Mucoepidermoid Carcinoma was most common malignancy 3 (10%) followed by adenoid cystic carcinoma 2 (6.66%). Out of 7, 3 were stage 3(42.85%) and 3 were stage 4(42.85%). In histological grading 3 were low grade (42.85%) and 4 were high grade (57.14%). All the patient were parotidectomy. Few were treated by radical parotidectomy plus radiotherapy.

Conclusion: Though it is a small series to comment on the whole spectrum of the parotid gland neoplasm in Bangladesh, yet an idea about the frequency of disease can be established but actual incidence in Bangladesh as a whole can not be ascertained from this study.

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Introduction

Parotid gland is the largest of the three major paired salivary glands. A variety of neoplastic and non-neoplastic conditions of the parotid present as swelling of the gland. It is not always possible to predict the nature of a swelling on clinical grounds alone. Among the parotid swelling 75% are neoplastic, remaining 25% are non-neoplastic diseases such as cysts and inflammation.¹ Neoplastic swelling of the salivary gland represent about 3% of all head and neck tumors.²

Approximately 80% of all salivary gland neoplasm arise in parotid gland and 80% of parotid neoplasm are benign. Again 80% benign parotid neoplasm is

pleomorphic adenoma.³ Most of the parotid neoplasm is slowly growing. The patients are not aware about his disease and present late in the course of disease. As a result adequate and appropriate management could not be possible that time. The diagnosis is often only made after resection and at that stage the surgeon may wish that a more extensive procedure had been undertaken. In the first instance, there is multiplicity of tumour type, many of which are characterized by a variable and diverse histological appearance. Thus the distinction between benign and malignant, may be very difficult on the basis of fine needle aspiration (FNA) or small biopsies. Second, the most common benign tumour (Pleomorphic adenoma) has a premalignant potential, which is unique in the head & neck. Third, many salivary malignancies are characterized by an indolent growth pattern, but with a high tendency to recur locally or give rise to distant metastasis.⁴ Preoperative tissue diagnosis by FNAC is often inconclusive. Salivary gland tumors pose a particular challenge to the surgical pathologist.

Although the parotid gland neoplasm is not less

common in our country in comparison to western countries. Yet negligible number of studies has been carried out in our country in the past. This study has been designed to see the role of FNAC in neoplastic parotid lesion which will be beneficial for proper management.

Materials and Methods

This was a Prospective study it was carried out during the period of July, 2011 to April, 2013 among the patients admitted in the General Surgery and Otolaryngology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka.

All patients of parotid gland neoplasm, of all age and sex, which were FNAC proved, were included in this study. All Inflammatory parotid swelling, Pseudoparotomegaly masseter hypertrophy, dental cyst, neuroma of facial nerve were excluded. Data were collected from the patient by personal interview in a prescribed protocol. All data were analyzed by computer.

Results and Observations

The present series of 30 cases include the varieties of parotid gland swellings.

Table-1
Sex distribution in parotid swelling (n=30)

Sex	Benign No.	%	Malignant No.	%	Total No.	Percentage %
Male	10	43.47	03	42.85	13	43.33
Female	13	56.52	04	57.14	17	56.67

Table-2
Age distribution (n=30)

Age in years	No of patients	Percentage
10 - 20	01	3.33
21 - 30	2	6.67
31 - 40	6	23.33
41 - 50	11	36.66
51 - 60	7	23.33
61 - 70	3	10
Total	30	100

Table-3
Frequency of benign and malignant neoplasms (n30)

Parotid	Benign	23	76.66%
	Malignant	7	23.33%
Total		30	100%

Table-4
Frequency of different types of parotid neoplasms histopathologically confirmed

Neoplasms	Types	No of patients	Percentage
Benign	Pleomorphic adenoma	20	66.66
	Warthin's tumour (adenolymphoma)	3	10
Total	Benign	23	76.66
	Mucoepidermoid carcinoma	3	10
	Adenoid cystic carcinoma	2	6.66
Malignant	Cacinoma in pleomorphic adenoma	1	3.33
	Papillary cystadenocarcinoma	1	3.33
Total	Malignant	7	23.33
Total	Both Benign and Malignant	30	100

Table-5
Site of parotid pleomorphic adenoma (n20)

Parotid Gland	No.	Percentage (%)
Superficial lobe	18	90%
Deep lobe	2	10%

Table-6
Comparison of FNAC with final histopathology (n=30)

FNAC	No. of the patients	Histopathology					
		Pleomorphic adenoma	Warthin's tumour	Mueoepidermoid carcinoma	Carcinoma in pleomorphic adenoma	Adenoid cystic carcinoma	Papillary cystadenocarci noma
Pleomorphic adenoma	18	17	1	-	-	-	-
W arthin's tumour	3	-	2	-	-	-	1
Mueoepidermoid carcinoma	3	-	-	3	-	-	-
Adenoid cystic carcinoma	1	-	-	-	-	1	-
Carcinoma in pleomorphic adenoma	1	-	-	-	1	-	-
Benign neoplastic like lesion	4	3	-	-	-	1	-
Total	30	20	3	3	1	2	1

Table showed the comparative study of FNAC & Final histopathology findings of surgical resected specimens. There were 23 benign and 7 malignant neoplasms which were accurately diagnosed and giving a diagnostic accuracy of 90%. There were 3(10%) false negative reports.

Table-7

Types of malignant neoplasms	Low grade		High grade	
	No.	%	No.	%
Mu coepidermoid carcinoma	1	14.28	2	28.56
Carcinoma in pleomorphic adenoma	1	14.28	-	-
Adenoid cystic carcinoma	1	14.28	1	14.28
Papillary cystadenocarcinoma	-	-	1	14.28
Total	3	42.8	4	57.14

Table-8
Treatment of benign parotid neoplasm (n=23)

Types of benign neoplasm	Treatment modalities	No of cases	Percentage %
Pleomorphic adenoma (superficial lobe)	Superficial parotidectomy	18	78.26
Pleomorphic adenoma (deep lobe)	Total conservative parotidectomy	2	8.69
Warthin's tumour	Superficial parotidectomy	3	13.4

Table-9
Treatment of malignant parotid neoplasm (n=7)

Types of malignant neoplasm	Treatment modalities	No of cases	Percentage (%)
Mucoepidermoid carcinoma (stage - 2, low grade)	Total conservative parotidectomy	1	11.11
Mucopidermoid carcinoma Stage - 3, high grade)	Radical parotidectomy plus post operative irradiation	2	22.22
Adenoma Cystic carcinoma stage - 4, high grade)	Radical parotidectomy plus neck dissection postoperative irradiation	1	11.11
Carcinoma pleomorphic Adenoma (stage - 2, Low grade)	Total conservative parotidectomy	1	11.11
Papillary cystadenocarcinoma (stage - 2, low grade)	Radical parotidectomy plus postoperative irradiation	1	11.11
Adenoid cystic carcinoma (stage - 3, high grade)	Total conservative parotidectomy	1	11.11

Discussion

In the present series, 30 cases of parotid gland neoplasm studied with particular reference to find out the frequency of different parotid neoplasm's, clinical presentation, histological types and correlation of the findings of FNAC with final histopathological reports from the surgically respected specimens were discussed. The results of this series were also compared to other reports of the different parts of the world.

Aetiology of the parotid neoplasm largely unknown; Schneider et al., who showed an association between radiation exposure with salivary gland neoplasm; in this study, none of the cases was history of irradiation. Smokers have eight times risk than the non smoker for the development of Warthin's tumour and in this series 80% male patients found to have the history of smoking.

Neoplasms of the parotid gland may occur at all ages, ranging from early youth to advanced age Howard et al. and Mokhight reported that these were occasionally found in the newborn. Marshall and Miles mentioned malignant tumours usually appear in later age group. In this series highest numbers of patients 11(36.66%) were in 5th decade and 7(23.33%) were in 6th decade which correlates with other studies.⁴ All patients were above 15 years and

below 70 years; 11(36.66%) were in 5th decade and 7(23.33%) were in 6th decades.

Regarding sex distribution, the benign parotid neoplasms found 13(56.52%) cases were female and 10(43.47%) cases were male. As to the malignant parotid neoplasms, 4(57.14%) cases were female and 3(42.85%) cases were male. In this series in all parotid neoplasm male and female ratio 1:1.³

In this series all the patients presented with a swelling in the parotid region. (size of the swellings were variable) Benign swelling were mostly pleomorphic adenoma and ranging from 2 to 4 cm in size. 2 cases of pleomorphic adenoma involving deep lobe of the parotid gland and presented with inward and forward bulging of the tonsil and faucial pillars. 3 cases of Warthin's tumour only presented with swelling in the tail of the parotid having no other symptoms. Benign swelling were large in size and longer in duration.

Tumours of the parotid gland may involve superficial or deep lobe or whole of the gland. In this series 18(90%) cases of pleomorphic adenoma arose from the superficial lobe, only 2(10%) arose from the deep lobe, which agree with other study.⁵

Fine needle aspiration cytology (FNAC) is being increasingly used in the diagnosis of parotid gland lesions. Their superficial location, easy accessibility and high diagnostic accuracy make it popular method for evaluating parotid gland neoplasms. It is also quite effective in the pre evaluation of parotid gland masses. Eneroth et al. reported 1000 cases with a high degree of reliability. The accuracy ranges from 77-95%, Among the parotid tumours, pleomorphic adenoma found to be the most reliable because of the characteristic group of epithelial cells within a myxomatous substance.^{6,7} The complication of seeding through the needle tract in malignant lesions have not been reported.²

In this series, out of 30 cases of parotid neoplasm; 23(76.66%) cases were benign and the rest 7(23.33%) were malignant. This result conformed with other studies.¹ Among the benign tumours in this series, common was pleomorphic adenoma, which were 20(66.66%) cases corresponds with the higher frequency in the different western studies. Warthin's tumour 3(10%) also conformed to Oilier studies. Among the parotid malignancy, mucoepidermoid carcinoma 3(10%), adenoid cystic carcinoma 2(6.66%) and papillary cystadenocarcinoma 1(3.33%), carcinoma in pleomorphic adenoma 1(3.33%).

The present study compares FNAC with histopathological features of surgically resected specimens. Out of the 18 cases of pleomorphic adenoma, 17 were correctly diagnosed, accuracy is 94.44% in this series. Compare with other studies where diagnostic accuracy is 80.4 to 98%.² A few pitfalls in the diagnosis could not be avoided and 3 cases showed error in diagnosis. One case of pleomorphic adenoma was diagnosed on cytology as Warthin's tumour, one case of Warthin tumour was diagnosed as papillary cystadenocarcinoma and one benign like lesion was found as Adenoid Cystic Carcinoma. FNAC of parotid gland providing rapid

financial advantages by providing rapid and accurate diagnosis on a OPD basis.^{6,7}

Conclusion :

Tumours of the parotid gland can occur at any age. Meanwhile some lesions can be diagnostically challenging. Careful history and clinical examination are required. FNAC speeds up the diagnostic process and it is a valuable adjunct to preoperative assessment in patients with parotid swelling. FNAC is a useful preoperative diagnostic tool for malignant parotid and submandibular glands with high specificity and sensitivity. But it partly depends on operative skill, it may give false negative and false positive result. So every surgically resected parotid and submandibular gland tumour specimen should be confirmed by histopathological examination.

Reference

1. Byrne MN, Spector JG. Parotid Masses: evaluation, analysis and current management, *Laryngoscope* 1988; 98(1): 99-105.
2. Bhatia A. Fine needle aspiration cytology in the diagnosis of mass lesion of the salivary gland. *Indian J. Cancer* Mar. 1993; 30(1): 26-30.
3. Kerr G. Alan. *Scott-Brown's Otolaryngology, Laryngology and Head and Neck Surgery*, 7 ed; Hodder Arnold 2008; vol 3; pp 2503-2505.
4. Watkinson C. Jhon, Gaze N. Mork, Wilson A. Janet, Stell and Maran's *Head and Neck Surgery*, 4th ed. 2000; 441-455.
5. Son PR, Bergeron RT. *Head & Neck imaging*. St louis: Mosby Yearbook, 1991: 320-340.
6. Quizilbash Ali, Sianos J., Young JEM, Archibald SD. Fine needle aspiration cytology of major salivary glands. *Acta Cytol* 1985; 29:503-12.
7. Zurrida S, Alasiol, Tradati, et al. Fine needle aspiration of parotid mass. *Cancer* 15 Oct. 1993; 72(8): 2306-11.