



Original Article

ROLE OF FNAC IN EVALUATION OF PAROTID GLAND SWELLING

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Abstract

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

Methods: An attempt has been made to find out age and sex distribution, FNAC findings and histological type of parotid gland neoplasm. 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.

Result: Regarding investigations in this series Fine Needle Aspiration Cytology (FNAC) was done in all 30(100%).

In this series out of 30 cases of parotid neoplasm 23 (76.66%) cases were benign and rest 07 (23.33%) were malignant. Among the benign tumours commonest was pleomorphic adenoma 20 (66.66%) and regarding malignancy Mucoepidermoid Carcinoma was most common 3 (10%) then 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 underwent parotidectomy. Few were treated by radical parotidectomy plus radiotherapy. Early diagnosis and treatment of major salivary gland tumour is likely to lead a fare outcome.

Conclusion: FNAC is a useful preoperative diagnostic tool for parotid gland swelling with high specificity and sensitivity. Though it is a small series to comment on the whole spectrum of the parotid gland swelling in Bangladesh, yet this study has been designed to see the role of FNAC in neoplastic parotid lesion which will be beneficial for proper management.

Introduction

Parotid gland is the largest of the three major paired salivary gland. A Varsity of neoplastic and non-neoplastic conditions may present with parotid swelling. 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

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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. When disease spread locally and distally then they came for the treatment. 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. Differentiating benign from malignant tumors may be difficult, primarily because of the complexity of the classification and the rarity of several entities¹⁰.

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.

Aims and 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.

Materials and Methods

This was a Prospective study carried out during the period of July, 2011 to April, 2013 among the patients admitted in the Dept. of 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 the data were statistically analyzed by computer.

Results and Observations

The present series of 30 cases include the varieties of parotid gland neoplasms both benign and malignant.

Table-I
Sex frequency in parotid neoplasms (n=30)

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

Table showed the sex distribution of different parotid neoplasms. In benign parotid neoplasms frequency of female was more 13(56.53) than male 10(43.47%) and in case of malignant neoplasms female 4(57.14%) and male 3(42.85%); Both benign and malignant tumours female 17(56.67%) and male 13(43.33%). Highest number of patients neoplasms were found in 5th decade (41-50 years) of life and found in 11 (36.66%) cases. Next common age were noted in 4th decade of life and 07 (23.33%) cases. In this study, lowest age was noted 16 years and highest age was 70 years.

Table-II
Site of parotid pleomorphic adenoma (n20)

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

Table Showed site of pleomorphic adenoma in the parotid gland 18 (90%) were in superficial lobe and 2 (10%) were in deep lobe respectively.

Table-III
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
Malignant	Mucoepidermoid carcinoma	3	10
	Adenoid cystic carcinoma	2	6.66
	Carcinoma in pleomorphic adenoma	1	3.33
	Papillary cystadenocarcinoma	1	3.33
Total	Malignant	7	23.33
Total	Both Benign and Malignant	30	100

Table showed the frequency of different types of benign and malignant parotid neoplasms. Out of 23(76.66%) benign neoplasm 20 (83.33%) were pleomorphic adenoma and only 3 (17.4%) were Warthin's tumour. Out of 7 (23.33%) malignant neoplasms, 3 (10%) were mucoepidermoid carcinoma & 2(6.66%) were adenoid cystic carcinoma.

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

FNAC	Histopathology						
	No. of the patients	Pleomorphic adenoma	Warthin's tumour	Mueoepi-dermoid carcinoma	Carcinoma in pleomorphic adenoma	Adenoid cystic carcinoma	Papillary cystadenocarcinoma
Pleomorphic adenoma	18	17	1	-	-	-	-
Warthin'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-V
Histological grading of malignant parotid neoplasms (n== 7)

Types of malignant neoplasms	Low grade		High grade	
	No.	%	No.	%
Mucoepidermoid 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 showed the histological grading of different malignant parotid neoplasms. Out of 7 cases, 4(57.14%) were in high grade and 3 (42.80%) were in low grade.

Table-VI
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 showed the surgical treatment of different benign parotid neoplasms. Out of 23 cases, 20 were pleomorphic adenoma of which 18(76.19%) confined in the superficial lobe & treated by superficial parotidectomy, 2(9.52%) cases involved deep parotid lobe and treated by total conservative parotidectomy. The rest 3 (14.29%) were Warthin's tumour and treated by superficial parotidectomy.

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

Types of malignant neoplasm	Treatment modalities	No of cases	Percentage (%)
Mucoepidermoid caitinoma (stage-2, low grade)	Total conservative parotidectomy	1	11.11
Moepidefinoid 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
Carcinom inpleomorphic Adenoma (stage -2, Low grade)	Total conservative parotidectomy	1	11.11
Papillaiy cystadenocaitinoma (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

Table showed low grade - Mucoepidermoid carcinoma, carcinoma in pleomorphic adenoma and papillary cystadenocarcinoma were treated by total conservative parotidectomy; high grade- mucoepidermoid carcinoma were treated by radical parotidectomy plus postoperative irradiation; one adenoid cystic carcinoma treated by radical parotidectomy plus neck dissection plus postoperative radiotherapy.

Discussion

A total of 30 cases were collected from inpatient departments of General Surgery and Otolaryngology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka since July, 2011 to April, 2013. Overall total number of cases was smaller and duration was also short and find out the exact frequency may not possible. A larger study was required, on a great deal of patients over prolonged period of time covering different corners of the country to explore the true incidence.

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. Marshal 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.^{4,8} All patient were above 15 years and below 70 years; 11(36.66%) were in 5th decade and 7(23.33%) were in 4th 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. which is similiar with the study of Dhingra PL.⁹

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 seedling 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 correlates on 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}

After assessment of the tumours whether it was benign or malignant the patients were treated accordingly. Among the benign tumour 20 were pleomorphic adenoma, out of which 18(65.21%) were treated superficial parotidectomy & 2 were treated by total conservative parotidectomy. Remaining 3(13.04%) were Warthin's tumour and also treated by superficial parotidectomy.

Out of 7 malignant tumours; 3 were stage-2, low grade treated by total conservative parotidectomy; 3 were stage-3, high grade treated by radical parotidectomy plus post operative irradiation; one case was stage-4, high grade, treated by radical parotidectomy plus modified radical neck dissection plus post operative irradiation.

In this series 30 cases of parotid neoplasm were collected from in patient departments of General Surgery and Otolaryngology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka since July, 2011 to April, 2013. 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 cannot be ascertained from this study.

Finally, I confess my own ignorance on this complicated topic despite, utmost sincerity to find out the actual facts and figures related to the subject. I also emphasize that this tiny study should need an elaborate and extensive study on a great deal of patients over prolonged of time covering different corners of the country to explore the truth related to the subject prevailing in this country.

Conclusion

Tumours of the parotid gland can occur at any age. Mean while 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 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 gland tumour specimen should be confirmed by histopathological examination.

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