

Morphological Pattern and Frequency of Parotid Tumor

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Salivary gland tumors are rare, generally benign and affect mainly the parotid gland. The purpose of this study was to find out the frequency of different types of parotid tumors in relation to age and sex of our study population. This was a retrospective cross-sectional study conducted in the Department of Pathology, Enam Medical College and Hospital, Savar, Dhaka from January 2006 to December 2011. The study included all patients with parotid gland tumors. A total of 41 patients were analyzed according to gender, age and histopathology of the lesions. There were 18 (43.9%) males and 23 (56.1%) females, with male to female ratio of 1:1.28. The age ranged from 16 to 65 years with a mean of 39.32 ± 12.41 years. The peak incidence of benign tumors was in the fourth decade (42.42%) and malignant tumors in the six decade (50%). Tumors were benign in 33 patients (80.49%) and malignant in 8 (19.51%) patients. The ratio of benign to malignant tumors was 4.13:1. The most frequent benign tumor was pleomorphic adenoma (72.73%), followed by Warthin tumor (12.12%). Among malignant tumors, mucoepidermoid carcinoma was the most common (50%), followed by adenoid cystic carcinoma (37.5%).

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Key words: Parotid tumour, Warthin tumor, Mucoepidermoid carcinoma, Adenoid cystic carcinoma

Introduction

The salivary gland (SG) tumors are relatively uncommon, accounting for less than 2% of all tumors and 3% to 6.5% of all head and neck tumors.^{1,2}

Parotid gland is the largest of all salivary glands, and the site of most salivary tumors. About 65% to 80% of all SG tumors arise in the parotids and great number of this is benign tumor with an average prevalence of 70% to 85% of all parotid tumors.¹ Parotid gland tumor represents a heterogeneous group of neoplasm, with a broad range of histological types and growth pattern because of their mixed array of cells and tissues.

Pleomorphic adenoma (PA) is the most common benign SG neoplasm, comprising about 50%-74% of all parotid tumors.¹⁻⁵ It is followed by Warthin tumor (WT) which accounts for about 4%-14% of all parotid tumors. The most common parotid malignancy is the mucoepidermoid carcinoma (MEC), followed by adenoid cystic carcinoma (ACC).⁴ About 90% of parotid tumors occur in the superficial lobe while the remaining 10% occur in the deep lobe, lying under to the facial nerve.

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Worldwide studies show geographic variation in the relative incidence of SG tumors with differences in histologic types. Metastatic cutaneous squamous cell carcinoma has been shown to be a common cause of parotid tumors.⁵ The disease spectrum differs in the African population compared to that of the others with an increased ratio of malignant to benign tumors in Africa, and WT occurring less commonly.⁶⁻⁸

Parotid tumors occur at any age. The benign tumors most often appear in the third and fourth decades of life and the malignant tumors in the six and seventh decades of life.⁹ The mean age for malignant lesions is 10 years greater than for benign lesions. Several studies have reported a female preponderance of parotid neoplasms and an increased frequency of malignant tumors in males.¹⁰

Patients often presents with a lump in a parotid region, facial swelling, facial paresis, pain, and enlarge neck node. Sudden enlargement of lump, pain, facial nerve dysfunction, and cervical lymphadenopathy are often indicators of malignancy. Clinical examination alone does not always differentiate between benign and malignant parotid tumors. Radiologic findings provide additional information concerning the size, the site and relationship between the mass and the salivary gland but its exact nature cannot be ascertained. Preliminary needle or incisional biopsy is hazardous due to the possibility of tumor spillage, and the diagnostic yield may be low due to an inadequate tissue specimen for cytological examination. The safest and most acceptable means of diagnosis is complete surgical excision with permanent histological section.¹¹

The purpose of this study was to find out the different types of parotid tumors and their

prevalence in different age groups of our study population.

Methods

This is a retrospective cross sectional study conducted in the Department of Pathology, Enam Medical College and Hospital, Savar, Dhaka from January 2006 to December 2011. All patients of parotid tumors of any age and either sex were included in this study. A total of 41 cases were included for histological evaluation. Histology slides of all cases were reviewed and data regarding age, gender, and clinical information were obtained from histopathology request forms and register.

All biopsies were fixed in 10% formalin and routine hematoxyline-eosin stained sections were examined. Special stain like Ziehl-Neelsen and periodic acid-Schiff were employed where necessary. Only one biopsy per patient was included. Results were interpreted with respect of age, sex, and behavior (benign and malignant) on the basis of histopathological diagnosis.

Results

Out of total 41 cases of parotid tumors, there were 18 (43.9%) male and 23 (56.1%) female, with male to female ratio of 1:1.28 (Figure 1). Tumors were benign in 33 (80.49%) patients and malignant in 8 (19.51%) patients. The ratio of benign to malignant tumors was 4.13:1. The age ranged from 16 to 65 years with a mean of 39.32 ± 12.41 years. The peak incidence was in the fourth decade (36.59%) and majority (92.68%) of the patients ranges from 21 to 60 years of age (Figure 2). The peak incidence of benign tumors was in the fourth decade (42.42%) and malignant tumors in the six decade (50%). It was observed that both males and females were frequent in fourth decade of life. Benign tumors occurred at a mean age of 37.15 ± 11.72 years, while malignant tumors occurred at 48.25 ± 11.77 years.

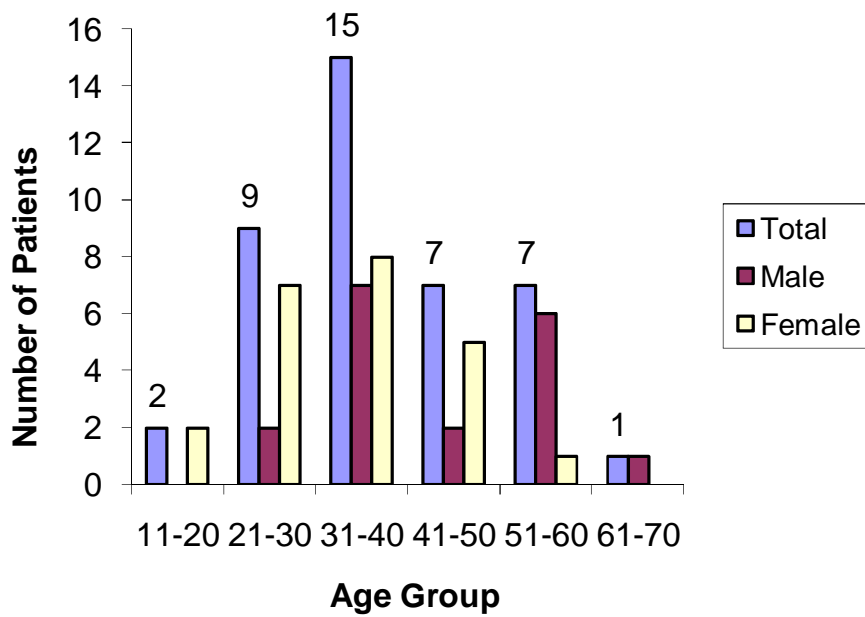


Figure 1. Distribution of male and female patients according to age

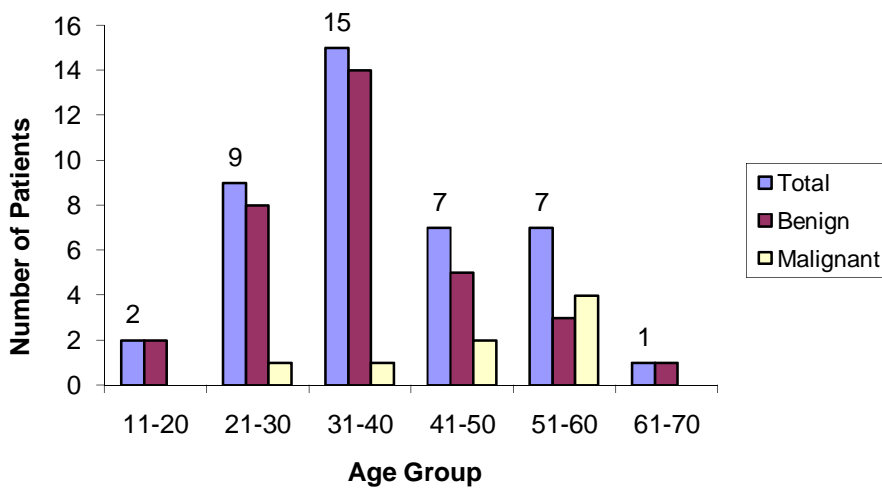


Figure 2. Distribution of benign and malignant tumors according to age

Table I: Distribution of parotid tumors according to histological type and age of patients

Tumor	11-20		21-30		31-40		41-50		51-60		61-70	
	M	F	M	F	M	F	M	F	M	F	M	F
<i>Benign tumor</i>												
Pleomorphic adenoma		2	2	5	5	6		3	1			
Warthin tumor					1				1	1	1	
Hemangioma				1								
Oncocytoma								1				
Myoepithelioma						1						
Basal cell adenoma						1						
Lipoma							1					
<i>Malignant tumor</i>												
Mucoepidermoid carcinoma				1	1		1		1			
Adenoid cystic carcinoma								1	2			
Acinic cell carcinoma									1			
Total		2		9		15		7		7		1

Table II: Age and gender of patients with parotid gland benign tumors

Tumor	Gender				Total		Age	
	Male		Female		N	% of group	Mean	Range
	N	%	N	%				
Pleomorphic adenoma	8	33.33	16	66.67	24	72.73	34.38±10.12	16-65
Warthin tumor	3	75	1	25	4	12.12	53.25±14.10	33-65
Hemangioma			1	100	1	3.03	25	
Oncocytoma			1	100	1	3.03	45	
Myoepithelioma			1	100	1	3.03	40	
Basal cell adenoma			1	100	1	3.03	38	
Lipoma	1	100			1	3.03	45	
Total	12	36.36	21	63.64	33		37.15±11.72	16-65

Table III: Age and gender of patients with parotid gland malignant tumors

Tumor	Gender				Total		Age	
	Male		Female		N	% of group	Mean	Range
	N	%	N	%				
Mucoepidermoid carcinoma	3	75	1	25	4	50	42.25±12.45	26-55
Adenoid cystic carcinoma	2	66.67	1	33.33	3	37.5	52.33±9.29	42-60
Acinic cell carcinoma	1	100			1	12.5	60	
Total	6	75	2	25	8		48.25±11.77	26-60

Benign tumors occurred more commonly in females (63.64%) and malignant tumors more commonly (75%) in males. The tumors were rarely found below twenty years of age and only two patients were detected in second decade of life.

The commonest clinical feature was that of a slowly growing painless swelling. Pain and rapid growth were reported in few of the patients with malignant lesions. The size of the malignant tumor (mean 4.4 cm) was larger than that of benign tumor (mean 3.2 cm).

Distribution of parotid tumors according to histological type and age of the patients are shown in Table I. The more frequent benign histological type resulted PA with 24 cases, comprising 58.54% of all tumors and 72.73% of the benign tumors. WT was the second most common benign tumor diagnosed in 4 cases (12.12% of benign tumors). There was a significant female prevalence (66.67%) in PA and males prevalence (75%) in WT. Other less frequent benign tumors were the basal cell adenoma, hemangioma, oncocytoma and myoepithelioma.

Age and gender of patients with parotid gland benign and malignant tumors are shown in Table II and III. MEC was the most frequent malignancy representing 9.76% of all tumors and 50% of the malignant tumors. ACC was the second largest group of the malignant tumors with 3 cases (37.5% of malignant tumors), followed by acinic cell carcinoma. Cervical lymphadenopathy was observed in 3 patients of MEC.

Discussion

Parotid gland has a distinct morphology and their histology is extremely varied and complex due to its heterogeneous cellular composition. Although relatively rare, parotid neoplasms are a diverse group of head and neck tumors. In this present series 41 cases of

parotid neoplasms were analyzed with their frequency and behavior, as well as age and gender distribution of the patients. Diagnosis of all cases was confirmed by histopathological examinations.

The present study show a higher prevalence of benign tumors (80.49%) compared to malignant tumors (19.51%), as also reported in other studies.^{2,6-9,12,13} There was overall female predominance in tumors with a male to female ratio of 1:1.27, in agreement with other studies.^{4,6,9} Some studies showed higher frequency among men.^{6,7,14,15} In this study benign tumors were predominant in females (61.36%), while 60% of malignant tumors occurred in males, which correlate with another study.¹⁰

Age distribution ranged from 16 to 65 years with a mean age of 39.32 ± 12.41 years. Peak incidence was in the fourth decade, as reported by other study.⁹ In agreement with another study, majority (92.68%) of the patients ranged from 21 to 60 years of age.¹³ The peak incidence for benign tumors was in the fourth decade and for malignant tumors in the sixth decade of life. According to Lingen MW, about 5% of SG tumors occur in children younger than 16 years of age.¹ In our series, no patients were detected below 16 years of age and only two patients of pleomorphic adenoma were detected in second decade of life. The median age for malignant tumors (48.25 years) was significantly higher than for benign tumors (37.15 years), as observed in other study.⁹

In the present study PA was the most common histological type (58.54%) of all tumors and corresponds to 72.73% of all benign tumors, as reported by others.^{1-5,9,14,15} Out of 24 cases of PA, 16 (66.67%) occurred in women, with a peak incidence at the fourth decade of life and median age of 34.38 years.

Similar study reported that these lesions predominantly occurred in women, although peak incidence at the third decade of life,⁵ while another study described peak incidence in fourth decade and more common in males.⁷

All the cases were unilateral and left side glands were commonly affected (58.54%). As with other reports, the size of the swelling in most pleomorphic adenoma was more than 2 cm (ranging from 1 to 11 cm).^{14,15} The size of the malignant tumor was larger than that of benign tumor, as also found in other study.¹³ Patients with parotid lesions usually presents with a palpable or visible mass, nerve dysfunction, pain or cervical lymphadenopathy. In our series, majority of the patients presented with an asymptomatic mass of long duration. Pain, rapid growth and palpable neck node (7.3%) was reported in few of the patients with malignant lesions.

WT was the second most common benign tumor (12.12% of benign tumors) with a male to female ratio of 3:1. Similar results were also found in other studies.¹⁴ However, WT is extremely rare in studies from Africa.⁶⁻⁸ This affects mainly elderly patients and rarely occurs in patients younger than 30 years old.¹² In our study, the peak incidence was in the six decade with a mean age of 53.25 ± 14.1 years. Basal cell adenoma and myoepithelioma are rare tumors affected principally in the parotid gland.¹ In this study less frequent tumors found were the basal cell adenoma, hemangioma, oncocytoma and myoepithelioma.

MEC was the second most common (7.32%) tumor along with WT, and the most frequent malignancy (50% of the malignant tumors), as reported by others.^{1,12,14,15} Some studies consider ACC more common than MEC.^{6-9,13} We found three cases of ACC and one case of acinic cell carcinoma.

Conclusion

This study concluded that the majority of the lesions were benign tumors. Pleomorphic adenoma was the most frequent histologic type, followed by mucoepidermoid carcinoma, Warthin tumor and adenoid cystic carcinoma. The peak incidence of benign tumors was in the fourth decade and malignant tumors in the six decade of life. Female predominance was observed in all tumors and slight male predominance was in malignant tumors.

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