

Histopathological Study of Parotid Gland Tumors

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ABSTRACT

Background: Parotid tumors are a morphologically and clinically diverse group of neoplasms, which may present significant diagnostic and management challenges. There are no reliable criterias to differentiate clinically benign from malignant lesions, so morphological evaluation is necessary. Hence, present study is undertaken to study spectrum of various histomorphological features. To study prevalence, age, sex distribution, histomorphological aspects and to differentiate benign from malignant parotid tumors.

Methods: A total of 60 specimens of Parotid tumors analyzed from January 2012 to December 2014 from department of pathology, B.J Medical College, Ahmedabad. Specimens were fixed in formalin and sections were taken, processed and embedded in paraffin. The paraffin blocks were cut, slides made and stained with hematoxylin and eosin and examined. The tumors were classified according to (WHO) histological typing. The collected data were analyzed statistically.

Result: Prevalence of parotid tumors was 0.47 %. All the patients presented with mass. Most of benign neoplasms occurred in 3rd and 4th decade, while malignant neoplasms more common in 5th decade. Males were more commonly affected. Pleomorphic adenoma was the commonest benign tumor and Mucoepidermoid carcinoma was the commonest malignant tumor.

Conclusion: Although rare, parotid tumors are of importance because they show striking range of morphologic diversity between different tumor types and sometimes within an individual tumor mass. So, accurate diagnosis is essential which can be accomplished by histopathological examination.

Keywords: Parotid Tumors, Pleomorphic Adenoma, Mucoepidermoid Carcinoma, Histopathological Examination.

Introduction

Parotid gland is the site of origin of many neoplastic and non neoplastic lesions. Parotid gland tumors are a morphologically and clinically diverse group of neoplasms, which may represent significant diagnostic and management challenges because of their relative frequency, the limited amount of pretreatment information available and wide variety of biological behavior with different pathological lesions.^[1]

Parotid gland tumors are rare, with overall incidence in the world of approximately 2.5 to 3.0 cases per 1,00,000 per year. Malignant parotid tumors account for more than 0.5% of all malignancies and approximately 3 to 5% of all head and neck cancers.^[2] Although rare, Their remarkable morphologic variability combined with rarity renders these tumors difficult to diagnose. In addition, hybrid tumors, dedifferentiation and propensity for some benign tumors to progress to malignancy can confound histopathological interpretation.^[3,4]

Most patients with malignant parotid tumors present in the sixth or seventh decade with mean age is 55 to 65 years while benign lesions typically develop at least a decade earlier at mean age of 45 years.^[2] Benign tumors (54-79%) are much more frequent than malignant ones (21-46%).

Most frequently encountered benign tumor is Pleomorphic Adenoma and Mucoepidermoid Carcinoma being the most common malignant tumor.^[5]

Little is known about the etiology of parotid gland tumors and high risk populations have not been identified. There are no reliable criterias to differentiate on clinical grounds the benign from malignant lesions, so morphological evaluation is necessary. Hence, present study is undertaken to study the spectrum of histomorphological features of various Parotid tumors and their typing according to WHO classification.^[6]

Aims and objectives of this study are

1. To study prevalence of Parotid gland tumors during period of 3 years.
2. To study age, sex distribution of various parotid gland tumors and compare with findings of other workers.
3. To study histomorphological (gross and microscopic) aspect and record the spectrum of morphological features of these lesions.
4. To differentiate benign from malignant conditions.

Materials and Methods

The material required for the study was collected from January 2012 to December 2014 from the department of

pathology, B.J Medical College, Ahmedabad for period of 3 years.

A total of 60 specimens of Parotid tumors were analyzed consisting of open biopsies, superficial Parotidectomies and total Parotidectomies with or without draining lymph nodes, specimens were fixed in formalin and sections were taken from the lesion, its margins, surrounding tissue and lymph nodes if any. Sections were processed and embedded in paraffin. The paraffin blocks were cut, slides made and stained with hematoxylin and eosin. These slides were examined for cellular architecture, encapsulation, perineural and vascular patterns and surrounding areas. The tumors were classified according to (WHO) histological typing.

Data acquired from examination of each specimen was tabulated using a proforma in systematic sequence. The collected data were analyzed statistically and results obtained are compared to the existing studies in the literature.

Result

The present study carried out from January 2012 to December 2014. During the period, a total of 12587 specimens received for histopathological examinations, of

which 60 specimens were of parotid tumors, representing 0.47 %. Thus, the prevalence of salivary gland tumors in this study was 0.47% as shown in Table 1.

Of total 60 cases, 43(71.6%) were benign neoplastic lesions and 17(28.4%) were malignant neoplastic lesions as shown in table 2. Pleomorphic adenoma was the commonest benign tumor, accounted for 65.11% of all benign tumors and 46.67% of all parotid neoplasms. Out of 17 cases of malignant neoplasms, Mucoepidermoid carcinoma was the commonest and accounted for 28.4% of all malignant neoplasms and 11.67% of all parotid tumors.

The parotid gland neoplasms presented over a wide age range from 8 to 79 years. As shown in table 3, benign tumors were noted in age range from 8 to 71 years with mean age of 39.5 years and mostly common in 4th and 5th decade of life. The malignant tumors were noted in age range of 18 to 79 years with mean age of 48.5 years and common from 5th decade onwards.

Male preponderance is seen for all parotid tumors with M: F ratio of 1.14:1. For malignant neoplastic lesions M: F ratio is 1.42:1, for benign neoplastic lesions M: F ratio is 1.04:1, which is shown in table 4.

Table 1: Incidence of parotid tumors.

Particulars	Total	Percentage
Total Number of Specimens	12587	100%
Other Lesions	12527	99.53%
Parotid Tumor specimens	60	0.47%

Table 2: Incidence of all parotid tumors and their percentage.

Types of tumor	No of cases	Percentage
Benign		
Pleomorphic Adenoma	28	46.66%
Warthin Tumor	10	16.67%
Lymphangioma	01	1.67%
Capillary Hemangioma	01	1.67%
Neurofiblipoma	01	1.67%
Myoepithelioma	01	1.67%
Basal Cell Adenoma	01	1.67%
Total Benign lesions	43	71.6%
Malignant		
Mucoepidermoid carcinoma	07	11.67%
Adenoid cystic carcinoma	02	3.33%
Acinic cell carcinoma	01	1.67%
Carcinoma ex pleomorphic adenoma	01	1.67%
Malignant lymphoma	02	3.33%
Squamous cell carcinoma	02	3.33%
Salivary duct carcinoma	01	1.67%
Carcinosarcoma	01	1.67%
Total malignant lesions	17	28.4%
Total(Benign + Malignant)	60	100%

Table 3: Age wise distribution of parotid lesions.

Lesions	Age in years								
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	Total
Pleomorphic adenoma	1	2	4	9	11	1	0	0	28
Warthin tumor	0	0	1	1	1	2	3	2	10
Lymphangioma	1	0	0	0	0	0	0	0	1
Capillary hemangioma	0	0	1	0	0	0	0	0	1
Neurofiblipoma	0	0	0	0	1	0	0	0	1
Myoepithelioma	0	0	0	0	0	1	0	0	1
Basal cell adenoma	0	0	0	1	0	0	0	0	1
Benign lesions	2	2	6	11	13	4	3	2	43
Mucoepidermoid ca	0	1	0	1	1	2	2	0	7
Adenoid cystic carcinoma	0	0	0	0	1	1	0	0	2
Acinic cell carcinoma	0	0	0	0	0	1	0	0	1
Carcinoma ex pleomorphic adenoma	0	0	0	0	1	0	0	0	1
Malignant lymphoma	0	0	0	0	0	1	1	0	2
Squamous cell carcinoma	0	0	0	0	0	0	1	1	2
Salivary duct carcinoma	0	0	0	1	0	0	0	0	1
Carcinosarcoma	0	0	1	0	0	0	0	0	1
Malignant lesions	0	1	1	2	3	5	4	1	17

Table 4: Gender wise distribution of parotid tumors.

Lesions	Males	Females
Pleomorphic adenoma	11	16
Warthin tumor	6	4
Lymphangioma	1	0
Capillary hemangioma	1	0
Neurofiblipoma	0	1
Myoepithelioma	1	0
Basal cell adenoma	1	0
Benign neoplastic lesions	22	21
Mucoepidermoid carcinoma	3	4
Adenoid cystic carcinoma	1	1
Acinic cell carcinoma	1	0
Carcinoma ex pleomorphic adenoma	0	1
Malignant lymphoma	1	1
Squamous cell carcinoma	2	0
Salivary duct carcinoma	1	0
Carcinosarcoma	1	0
Malignant neoplastic lesions	10	7
Total (Benign + Malignant)	32	28

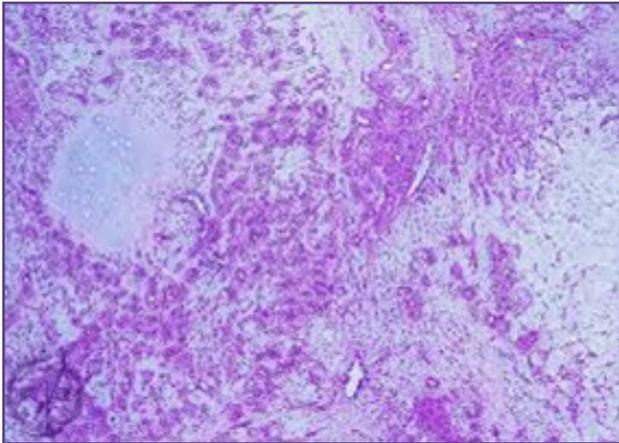


Fig. 1: Pleomorphic Adenoma – Epithelial(Ductal) and Stromal(Chondromyxoid) component. (H & E Stain; 20 X).

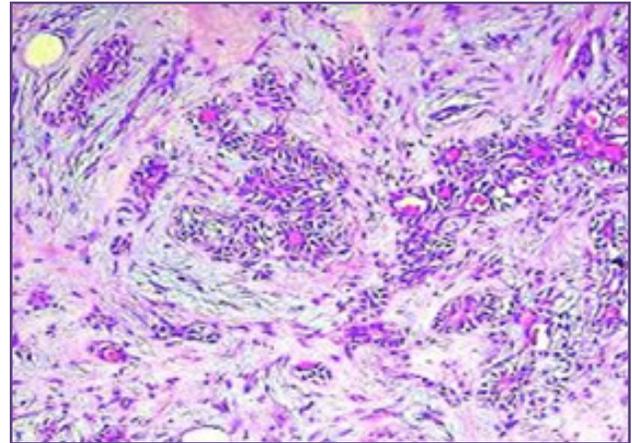


Fig. 2: Pleomorphic Adenoma – Epithelial cells arranged in tubules, islands, cords or sheets with chondromyxoid stroma. (H & E Stain; 40 X).

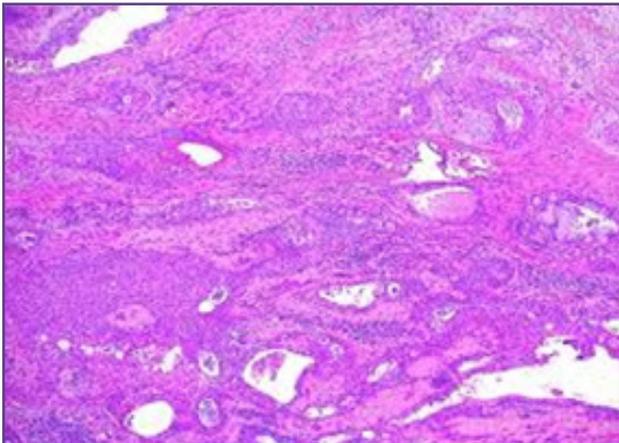


Fig. 3: Mucoepidermoid carcinoma – Cords, sheets, clusters of Mucous, Squamous, intermediate and clear cells, Inflammatory reaction to extravasated mucin or keratin. (H & E Stain; 20 X).

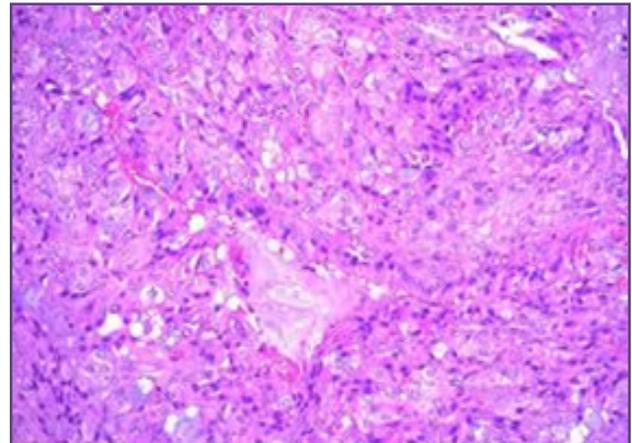


Fig. 4: Mucoepidermoid carcinoma- Mucous cells with abundant fluffy cytoplasm and large mucin vacuoles (H & E Stain; 40 X).

Discussion

This present study was conducted over a period of 3 years from January 2012 to December 2014. Study of 60 cases was done with incidence, age, sex, clinical presentation, gross and microscopic features. The results obtained were compared with those of previous studies of well known workers and significant differences and similarities in results are discussed below.

The prevalence of parotid gland tumors is 0.47% in this study. According to ONS Cancer Registration Statistics, England, 2013, Major salivary gland cancer is a rare disease accounting for 0.2% of all malignant neoplasms registered in England from 2009 to 2013^[7]. The prevalence of parotid tumors is higher in study conducted by Amos et al which

was 4.09%.^[8] Differences in results are due to differences in number of studied cases and duration of study.

In present study, 71.6% and 28.4% of the tumors were benign and malignant, respectively. A Brazilian study of 493 salivary gland tumors^[9] reported a distribution of 74.8% benign and 25.1% malignant tumors. Another study performed in a Brazilian population^[10] reported a distribution of 67.5% and 32.5% benign and malignant neoplasms respectively. An Iranian study of 130 cases^[11] found 68.2% benign and 31.8% malignant tumors. A Chinese series of 6982 salivary gland neoplasms^[12], reported 68% benign and 32% malignant cases. Although these reports are from different geographical areas, they are very similar between each other and to the present

review, suggesting that benign salivary gland tumors are more common than malignant tumors worldwide.

Pleomorphic adenoma is the commonest benign tumor and Mucoepidermoid carcinoma is most common malignant tumor involving the parotid gland in present study. These results are comparable with studies by other authors like Victor Shing Howe To et al.^[5] [Ochicha Ochicha](#),^[13] Shoeman BJ and Clifford SD,^[14] Shrestha S , Pandey G et al.^[15]

Benign tumors have tendency to occur at lower age, mostly in 4th and 5th decade of life with mean age of 39.5 years than malignant tumors occurs mostly from 5th decade onwards with mean age of 48.5. The results are comparable with studies conducted by Deepika sirohi et al. ^[16], Audrey Rousseau, Cecile Badoual.^[17]

In our study, M: F ratio in all parotid gland tumors is 1.14:1 suggesting slight male preponderance. These findings are consistent with the studies conducted by Shrestha S, Pandey G et al.^[15] which shows M: F ratio of 1.74: 1, Gireesh V Achalkar^[18] showing M: F ratio of 1.78: 1 and study done by Mohammad Ayub Musain et al.^[19]

Conclusion

Parotid tumors are relatively less common and they exhibit a wide variety of microscopic appearances even within one particular lesion having diverse clinical and prognostic outcomes and this has caused considerable problems in categorization and diagnosis. So, accurate diagnosis is essential as parotid neoplasms which can be accomplished by histopathological examination.

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Competing Interests

None

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