Original Research Article

A 5 years study of parotid gland tumors in a tertiary hospital

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Abstract

Background: The salivary glands, mainly parotids are the site of origin of a wide variety of neoplasms. At the same time, they are relatively uncommon and show racial and geographical variations. Majority (80%) are benign tumors, only about 20% are malignant. Histopathology of parotid neoplasms is most complex and diverse of any organ in the body. Also histopathology plays a major role in the diagnosis of these neoplasms with very few contribution using special stains, immunohistochemistry and cytogenetic studies.

Aim: The aim of the present study was to analyze the relative incidence, clinical presentation and spectrum of neoplasms in the parotid glands with their micromorphology at Gandhi hospital, Secunderabad, which is a tertiary referral hospital in Telangana state.

Material and methods: A retrospective and prospective study of all parotid gland tumors received in the department of pathology for histopathological examination at Gandhi hospital, Secunderabad during a period of 5 years, from January 2013 to January 2018 was done. The clinical data like age, sex, duration were recorded. Grossly representative bits from the tumors were processed, sections made, stained with routine Hematoxylin and Eosin and examined under microscope. Data of 48 cases recorded during the 5 years period was analyzed.

Results: 48 cases were studied during the 5-year period. Of them 39 cases were benign neoplasms and 8 cases were malignant. Benign tumors were more common in the parotid gland compared to malignant tumors, the most common benign tumor being Pleomorphic adenoma. Mucoepidermoid carcinoma was the most common malignant tumor. Most of the benign tumors occurred in the 3rd and 4th decade while the malignant tumors were more common in the 6th decade.

Conclusion: Pleomorphic adenoma is the most common benign tumor and Mucoepidermoid carcinoma is the most common malignant tumor.

Key words

Salivary glands, Parotid neoplasms, Histopathology, Immunohistochemistry, Pleomorphic adenoma, Mucoepidermoid carcinoma.

Introduction

Parotid gland neoplasms are uncommon tumors. They occur in 1 in 100,000 individuals comprising 3% of all head and neck neoplasms [1]. The mean age of patients with parotid gland tumors is 45 years with a peak in 6^{th} and 7^{th} decades of life [2, 3]. Benign parotid gland tumors occur more frequently in females whereas malignant tumors occur in males [4, 5].

Parotid gland is the most frequent site comprising about 70% of all salivary gland tumors [4-6]. These tumors show striking range of morphological diversity between different tumor types and sometimes within an individual tumor mass. In addition, hybrid tumors, dedifferentiation and the propensity for some benign tumors to progress to malignancy can confound histopathological interpretation [7]. 80% of parotid gland tumors are benign, most common being pleomorphic adenoma followed by Warthin's tumor [4].

The most common salivary gland malignancy is the mucoepidermoid carcinoma which involves mostly the parotid gland followed by the minor, submandibular and sub lingual glands [5, 6, 8].Adenoid cystic carcinoma is the second most frequent malignancy involving the salivary glands. Carcinoma ex pleomorphic adenoma is another infrequent aggressive malignancy believed to evolve from a preexisting benign adenoma [9]. The main symptoms in these patients are a mass in the gland followed by pain, facial palsy and skin ulcers.

Materials and methods

The present histomorphological study of the salivary glands was a retrospective and prospective study done over a period of 5 years from January2013 to January 2018. The material of the study comprised of 48 specimens of parotid gland tumors received in the histopathology department of Gandhi hospital, Secunderabad. These specimens were subjected to the routine processing and paraffin embedding. The sections were stained with routine Hematoxylin and Eosin stains and examined under light microscope (**Figure – 1 to 10**).

The relevant patient data such as age, sex, duration of the tumor and histopathological diagnosis were taken from the laboratory records.

Figure - 1: Benign Pleomorphic adenoma showing epithelial and mesenchymal like elements (10X).

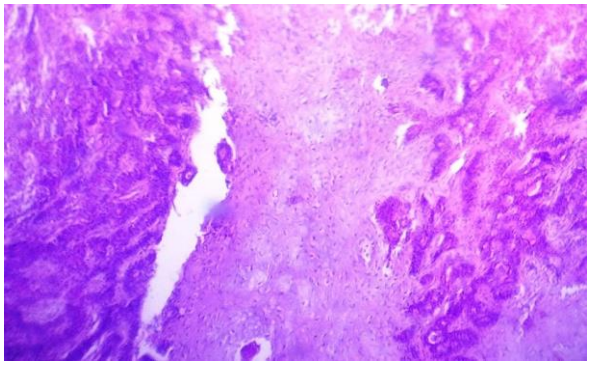
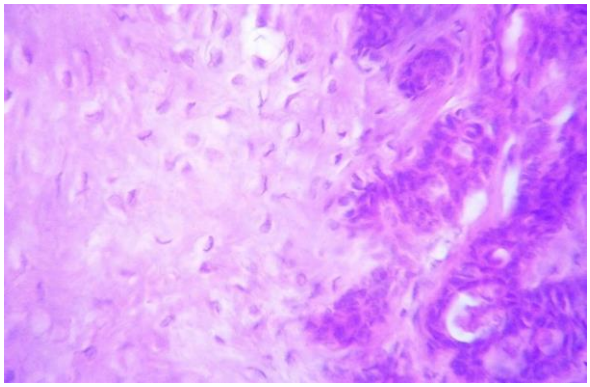


Figure - 2: Benign Pleomorphic adenoma showing fibromyxoid background (40X).



Results

In the present study during five-year duration, from January 2013 to January 2018, out of 5515 tumors involving various organs, 48 were Parotid gland tumors. The age of the study group ranged between 17-80 years. Majority of benign tumors were seen in 3rd and 4th decade while the malignant tumors were more common in the 6th decade. The sex ratio of the benign tumors observed was M: F was 6:7 whereas that of the malignant tumors was 1:2. The tumor size ranged between 20 cm being the largest and smallest measuring 2 cm.

Out of the 48 cases, benign tumors comprised 39 cases (81.25 %) and malignant tumors 9 cases (18.75%). The commonest benign tumor in our study was pleomorphic adenoma, comprising of 33 cases (68.75%) followed by 2 cases (4.16%) of Schwannoma, 2 cases (4.16%) of myoepithelial and 1 case (2.08%) each of Warthin's tumor and monomorphic adenoma.

Figure - 3: Benign Pleomorphic adenoma showing chondromyxoid background (40X).

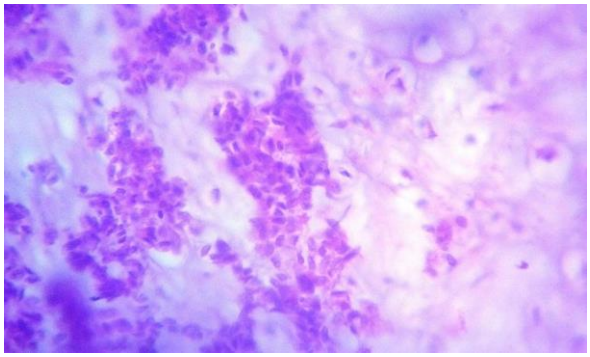


Figure - 4: Warthins tumor showing cystic spaces and lymphoid stroma with germinal centres (10X).

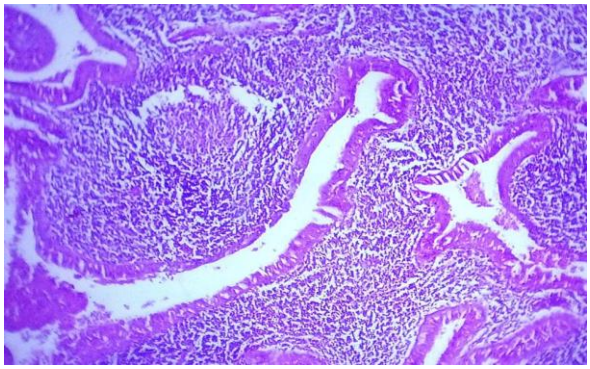


Figure - 5: Warthins tumor showing cystic spaces lined by bilayered oncocytic epithelium (40X).

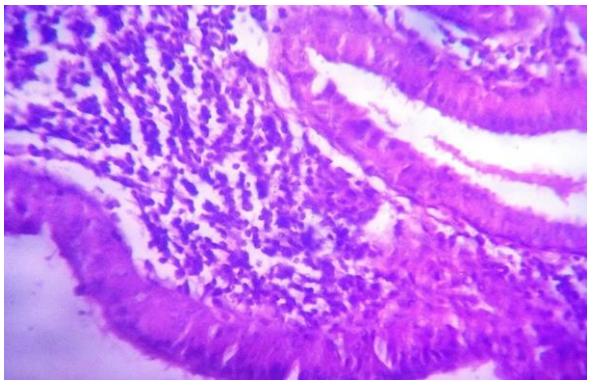


Figure - 6: Mucoepidermoid carcinoma showing epidermoid component and mucin filled cystic spaces (10X).

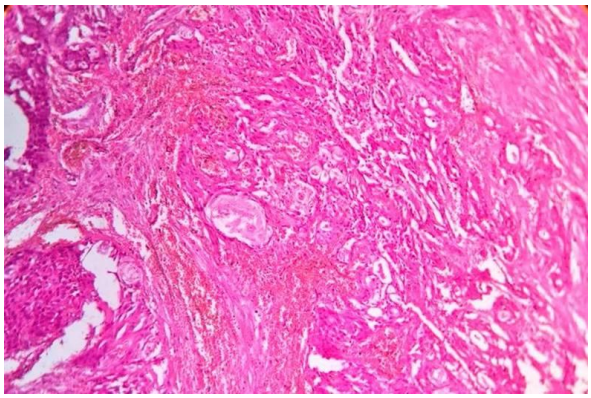
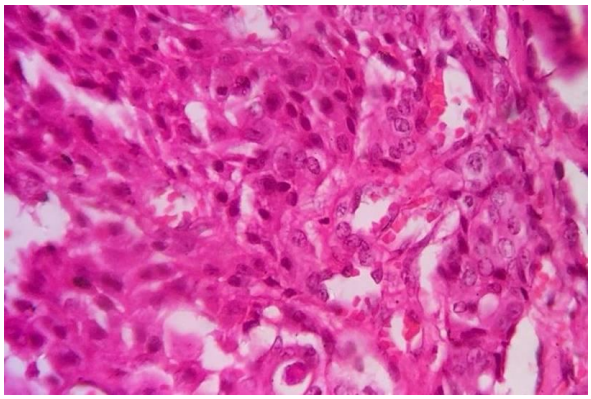


Figure - 7: Mucoepidermoid carcinoma showing epidermoid cells, intermediate cells and mucinous cells with hyperchromatic pleomorphic nuclei and intracellular mucin vacuole (40X).



The commonest malignant tumor in our study was Mucoepidermoid carcinoma (MECA) comprising of 4 cases (8.83%) followed by 3 cases (6.25%) of carcinoma- ex-pleomorphic

adenoma (Ca-exPA) and 2 cases (4.16%) of Adenoid cystic carcinoma (ACC).

Figure - 8: Mucoepidermoid carcinoma showing extravasated mucin (40X).

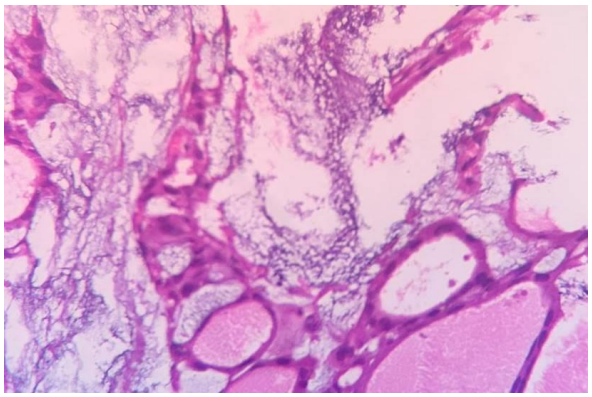


Figure - 9: Adenoid cystic carcinoma showing tubular growth pattern with pseudocysts (10X).

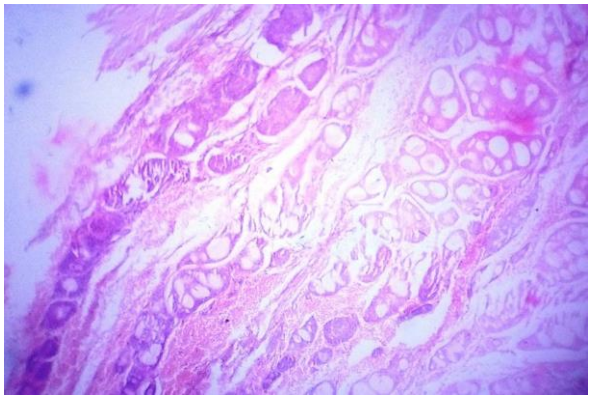


Figure - 10: Adenoid cystic carcinoma showing cribriform growth pattern with basaloid cells and necrosis (40X).

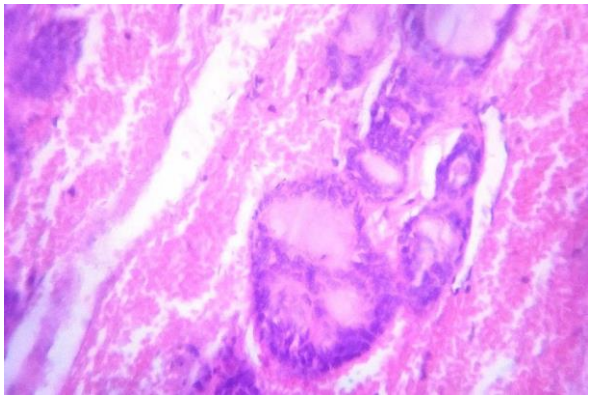


Table – 1 showed sex and histopathological distribution of Parotid gland tumors.
Table – 2 showed age distribution of Parotid gland tumors.

Discussion

Parotid gland tumors are relatively uncommon lesions [10]. In the present study during five-year duration, out of 5515 tumors involving various organs, 48 were Parotid gland tumors accounting for 0.87% of all neoplasms. These cases were evaluated and compared with similar studies in the literature.

Table - 1: Sex and histopathological distribution of Parotid gland tumors.

Tumor	Cases	%	M	F
A.Benign	39	81.25%	---	--
Pleomorphic adenoma	33	68.75%	14	19
Monomorphic adenoma	1	2.08%	--	1
Warthin's	1	2.08%	1	--
Schwannoma	2	4.16%	1	1
Myoepithelioma	2	4.16%	2	
B.Malignant	9	18.75%	--	--
MECA	4	8.83%	2	2
ACC	2	4.16%	--	2
Ca-ex PA	3	5.64%	1	2

The peak incidence of benign tumors is seen in the 4th decade which is similar to the other studies in the Asian subcontinent [11, 14]. The peak incidence of malignant tumors is seen in the 6th decade which is similar to the other studies in the literature [12, 15].

The sex ratio of the benign tumors M: F is 6:7 whereas that of the malignant tumors is 1:3. From the various studies done on Parotid gland tumors worldwide it seems that benign tumors occur more commonly in females, but malignant entities have a propensity to involve male patients [13]. This finding is not consistent in the present study because of the lesser sample size when compared to other studies.

Majority of the tumors of the Parotid glands are benign while only a small fraction is malignant. There was an inverse relation between the size of the tumors and the rate of malignancy except for

carcinoma ex pleomorphic adenoma where the tumor size and duration was more, compared to other malignant tumors [13].

In our study, Pleomorphic adenoma was the most common benign tumor and Mucoepidermoid carcinoma was the most common malignant tumor in the parotid gland, followed by Carcinoma ex pleomorphic adenoma, which is consistent with other studies in the world [9]. Histopathological examination of pleomorphic adenoma showed both epithelial and mesenchymal differentiation. Epithelial component includes well formed ductual structures formed of inner epithelial and outer myoepithelial cells with associated features of spindle, squamous, basaloid, cuboidal, oncocytoid, mucous, sebaceous, round, plasmacytoid, polygonal or clear cells. Squamous differentiation with keratin pearls was noted in two cases. Epithelial cells were bland, and the mesenchymal component consisted of myxoid, hyaline, cartilaginous or osseous differentiation. Mucoepidermoid carcinoma on microscopy showed varying proportions of mucous, epidermoid and intermediate type cells with cystic or papillary mucin filled cystic lumens with pools of extravasated mucin in surrounding tissue.

Table - 2: Age distribution Parotid gland tumors:

Tumors	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Above 80
Pleomorphic Adenoma	1	11	14	4	1	2	---	---
Warthin	---	1	---	---	---	---	---	---
Monomorphic Adenoma	---	1	---	---	---	---	---	---
Schwannoma	---	1	1	---	---	---	---	---
Myoepithelioma	---	---	---	1	---	1	---	---
MECA	---	---	---	1	1	2	---	---
ACC	---	---	---	---	---	1	1	---
Ca-ex PA	---	---	---	---	1	1	1	---

Conclusion

Benign tumors are more common than malignant tumors in the Parotid glands. Pleomorphic adenoma is the most common benign tumor and Mucoepidermoid carcinoma is the most common malignant tumor. Malignancy called Carcinoma ex pleomorphic adenoma can occur in a preexisting benign adenoma with sudden rapid increase in size.

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