

Malignancies in the Parotid Glands: A Histopathological Analysis

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ABSTRACT

Objective: The purpose of this study was to examine the incidence of benign and malignant parotid tumors, as well as their age and gender distributions, and histomorphological characteristics.

Study Design: Retrospective study

Place and Duration: Liaquat University of Medical and Health Sciences, Jamshoro in the duration from July, 2022 to December, 2022.

Methods: The department of pathology examined a total of 47 Parotid tumor specimens. Sections were obtained, processed, and paraffin-embedded after specimens were formalin-fixed. Slides were prepared, hematoxylin and eosin was used to stain them, and then the paraffin blocks were sliced. (WHO) histological type was used to categorize the cancers. The gathered data were statistically examined.

Results: There were majority 26 (55.3%) males and 21 (44.7%) females in this study. Among all, 34 (72.3%) cases had benign tumor and 13 (27.7%) cases were had malignant tumor. Among 34 cases of benign tumor, pleomorphic adenoma was the most common found in 17 cases and in malignant tumor mucoepidermoid carcinoma was the most common found in 6 cases. Majority of the cases of benign tumor were aged between 30-50 years.

Conclusion: Parotid tumors are significant even though they are uncommon because they exhibit a great variety of morphologic variability between various tumor types and occasionally even within a single tumor mass. Hence, a precise diagnosis is crucial and may be made by a histological study.

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

INTRODUCTION

Parotid gland tumors are uncommon, with an annual incidence of 2.5 to 3.0 cases per 100,000 people worldwide. Malignant parotid tumors occur for further than 0.5% of all malignancies and around 3 to 5% of all head and neck cancers. [1,2] While uncommon, their amazing morphologic variety, paired with their rarity, makes these tumors challenging to detect. Moreover, hybrid tumors, dedifferentiation, and the proclivity of some benign tumors to proceed to malignancy can all complicate histological interpretation. [3, 4]

Histopathological characteristics such as lymph base station metastasis or local recurrence associated with tumor development. Spiro reported in 1986 that the place of origin, histologic subtype, histologic grade, and clinical stage were all important predictive markers [5]. Nonetheless, some carcinomas have minor cytological atypia, making assessing tumor invasion difficult. There are validated grading systems for all malignant tumors, such as mucoepidermoid carcinoma (MEC), adenoma carcinoma (AdCC), salivary carcinoma, and those that are not specified (NOS) (formerly known as adenocarcinoma, NOS); however, a widespread histopathologic grading system for SGCs has not been recommended [6].

Many benign and malignant tumors have their start in the parotid gland. The parotid gland tumors are a morphologically and clinically diverse group of neoplasms, and because of their relative frequency, the scarcity of pretreatment knowledge, and the wide range of biological behavior associated with various pathological lesions, they may pose significant diagnostic and management challenges. [1]

When compared to benign lesions, which often appear at least a decade earlier at a mean age of 45 years, malignant parotid tumors typically manifest in individuals in their sixth or seventh decade, when their age ranges from 55 to 65. [7] There are far more benign tumors (54-79%) than malignant ones (21-46%). Pleomorphic Adenoma is the most often seen benign tumor, whereas Mucoepidermoid Carcinoma is the most frequently encountered malignant tumor. [8]

The pathogenesis of parotid gland tumors is poorly understood, and high risk groups have not been found. Because

there are no acceptable criteria for separating benign from malignant tumors based on clinical characteristics, morphological analysis is required. Hence, the current study is designed to investigate the range of histomorphological characteristics of different Parotid cancers and their WHO categorization.

The goal was to examine the age and sex distribution of different parotid gland tumors and compare those findings to those of other researchers.

MATERIALS AND METHODS

This Retrospective study was conducted at Liaquat University of Medical and Health Sciences, Jamshoro in the duration from July, 2022 to December, 2022 and comprised of 47 patients. Specimens were included after getting informed written consent from the patients. Those patients did not provide any written consent were excluded.

Open biopsies, superficial and whole parotidectomies, with or without draining lymph nodes, were used to collect the Parotid tumor samples for analysis. Samples were preserved in formalin, and slices were obtained from the lesion, its margins, the tissue around it, and any nearby lymph nodes, if any. Processed and paraffin-embedded sections were used. Slides were created, and hematoxylin and eosin was used to stain the paraffin blocks. We looked at the surrounding regions, perineural and vascular patterns, cellular architecture, and encapsulation on these slides. A (WHO) histological type system was used to categorize the cancers.

A proforma was used to tabulate the information obtained from each specimen's inspection in a methodical order. The acquired data underwent statistical analysis, and the conclusions were contrasted with those of earlier research that had already been published.

RESULTS

There were majority 26 (55.3%) males and 21 (44.7%) females in this study. There were 11 (23.4%) cases had age 11-30 years, 24 (51.1%) cases had age 31-50 years and 12 (25.5%) cases had age >50 years.(table 1)

Table-1: Age and gender of the cases

Variables	Frequency	Percentage
Gender		
Male	26	55.3
Female	21	44.7
Age		
11-30 years	11	23.4
31-50 years	24	51.1
>50 years	12	25.5

Among all, 34 (72.3%) cases had benign tumor and 13 (27.7%) cases were had malignant tumor.(figure 1)

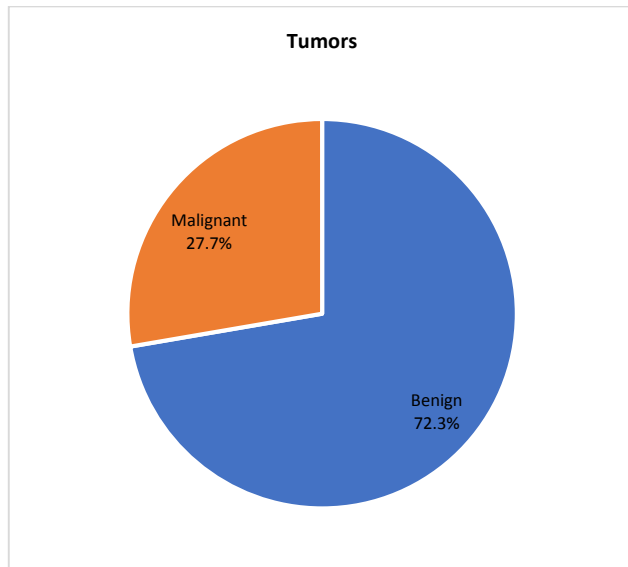


Figure-1: Association of parotid tumor types

Among 34 cases of benign tumor, pleomorphic adenoma was the most common found in 17 cases and in malignant tumor mucoepidermoid carcinoma was the most common found in 6 cases.(table 2)

Table 2: Types of benign and malignant tumors

Variables	Frequency (47)	Percentage
Benign Tumors		
pleomorphic adenoma	17	36.2
Lymphangioma	2	4.3
Capillary Hemangioma	1	2.1
Myoepithelioma	1	2.1
Neurofibolipoma	2	4.3
Basal Cell Adenoma	2	4.3
Warthin Tumor	9	19.1
Malignant Tumors		
Mucoepidermoid carcinoma	6	12.8
Squamous cell carcinoma	1	2.1
Malignant lymphoma	1	2.1
Adenoid cystic carcinoma	1	2.1
Acinic cell carcinoma	1	2.1
Carcinoma ex pleomorphic adenoma	1	2.1
Carcinosarcoma	1	2.1
Salivary duct carcinoma	1	2.1

DISCUSSION

Major salivary gland cancer is an uncommon condition, accounting for 0.2% of all malignant neoplasms diagnosed in England from 2009 to 2013[9], according to ONS Cancer Registration Data, England, 2013. According to Amos et al study, 's which had a parotid tumor frequency of 4.09%, these tumors are more common. [10]

In our study 47 specimens of parotid tumors were presented. There were majority 26 (55.3%) males and 21 (44.7%) females in this study. There were 11 (23.4%) cases had age 11-30 years, 24 (51.1%) cases had age 31-50 years and 12 (25.5%) cases had age >50 years. These findings were comparable to the previous studies.[11,12] Among all, 34 (72.3%) cases had benign tumor and 13 (27.7%) cases were had malignant tumor. Benign neoplasm incidence peaked in the fifth decade, and malignant neoplasm incidence peaked in the sixth and seventh decades. In the current investigation, benign tumors were more prevalent in all salivary glands than malignant ones. Also, the findings revealed that patients with malignant SGTs were older than patients with benign tumors, which is consistent with the majority of published data.Thirty-one percent of the 130 patients in an Iranian research [13] had malignant tumors, whereas 68.2% had benign ones. There were 68% benign and 32% malignant cases described in a Chinese series of 6982 salivary gland neoplasms [14]. There were 74.8% benign and 25.1% malignant tumors among the 493 salivary gland tumors studied in Brazil [15]. 67.5% and 32.5% of benign and malignant neoplasms, respectively, were reported in a Brazilian population by another research [16].

In the current study, mucoepidermoid carcinoma and pleomorphic adenoma are the most prevalent malignant and benign tumors affecting the parotid gland, respectively. Epithelial and mesenchymal differentiation is shown by histopathological features. The epithelial component contains the well-formed ductal structures made of exterior myoepithelial cells and inner epithelial cells, together with their associated spindle, squamous, basaloid, cuboidal, oncocytoïd, mucous, sebaceous, round, plasmacytoïd, polygonal, or clear cell characteristics. Four instances had squamous differentiation with keratin pearls (positive CK19), and one tumor had a large amount of adipose tissue.[17]

When compared to malignant tumors, which typically appear from the fifth decade forward with a mean age of 46.2, benign tumors tend to arise at a younger age, with the majority occurring in the fourth and fifth decades of life. The outcomes are equivalent to those of investigations carried out by Deepika Sirohi et al. [18] Warthin's tumor, which occurs only in the parotid gland and is only detected in men, was the second most frequent benign tumor of the parotid gland (19.1%). The key etiological cause for Warthin's tumor, which mostly affects older individuals and is extremely rare in those under the age of 30, is smoking behaviors, with a peak incidence in the sixth decade of life. [18]

Mucoepidermoid carcinoma was the most common among in malignant tumors in our study. On microscopy, mucoepidermoid carcinoma is formed of various proportions of mucous, epidermoid, and intermediate-type cells with cystic or papillary mucin-filled cystic lumens, and it frequently has pools of extravasated mucin in surrounding tissue that is strongly positive for mucicarmine stain (IHC positive for simple mucin-type carbohydrate antigens, i.e., T, Tn and syalosyl-Tn). These carcinomas may also have transparent cells with clear cytoplasm, mostly glycogen and little mucus. This carcinoma is graded as low (Grade I - Predominant cystic), intermediate (Grade II - Cystic and cellular), and high (Grade III - Predominant solid pattern). DDs include sialometaplasia and cystadenocarcinoma.

CONCLUSION

Parotid tumors are significant even though they are uncommon because they exhibit a great variety of morphologic variability between various tumor types and occasionally even within a single tumor mass. Hence, a precise diagnosis is crucial and may be made by a histological study.

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