

STUDY OF HISTOPATHOLOGICAL DIVERSITY IN PAROTID GLAND LESIONS

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Abstract

Introduction: Parotid gland swellings are common entity and annual incidence of tumors is less than 1 per 1 lakh population worldwide. Imaging and aspiration cytology have limited role in accurately diagnosing salivary lesions and hence microscopic diagnosis is essential.

Aims and objectives: The aim of the study was to study frequency and histomorphological pattern of salivary gland lesions.

Material and Methods: A retrospective study conducted (from March 2021 to April 2023) in Department of Pathology, Government Medical College. All patients diagnosed with (clinically or radiologically) salivary gland lesions were selected. Clinical details and histopathology slides were collected from hospital and histopathology records, respectively. Data obtained were analyzed using appropriate statistical methods.

Results: A total of 78 cases were studied and majority of patients belonged to middle age group 30-50 yr. In current study, malignant tumors are 30% and benign tumors are 70%. Sialoadenitis was common among non-neoplastic lesions.

Conclusion: Parotid gland lesions have histomorphological diversity. Histopathology is crucial in deciding the final management of the patient.

Key Words: Pleomorphic adenoma, sialadenitis.

INTRODUCTION

Parotid gland lesions present a broad spectrum of entities, ranging from benign to malignant pathologies, each with unique clinical and histopathological characteristics. Fine-needle aspiration biopsy (FNAB) has been recognized as a critical component in the preoperative

assessment of these lesions, aiding in the differentiation between neoplastic and non-neoplastic processes, and between benign and malignant tumors¹. Recent studies have highlighted the growth rate characteristics of specific parotid tumors, such as Warthin's tumors, providing insights into their natural history and informing clinical management². Moreover, the incidence of metastatic lesions to the parotid gland, particularly from cutaneous squamous cell carcinoma, underscores the complexity of parotid gland pathology and the importance of a comprehensive diagnostic approach³. Advances in imaging, particularly ultrasound, have improved the diagnostic accuracy for parotid gland oncocytomas, emphasizing the role of non-invasive techniques in the evaluation of these lesions⁴. The occurrence of rare entities such as metastatic atypical meningioma to the parotid gland further complicates the diagnostic landscape, illustrating the need for careful correlation of clinical, cytological, and histopathological data⁵. The incidental detection of parotid lesions on brain MRI highlights the importance of vigilance and a structured approach to these findings, given their potential clinical implications⁶. Since there is clinically wide range of presentation of both benign and malignant lesions, imaging and fine-needle aspiration cytology also has limited role in accurately diagnosing Parotid lesions. Parotid glands are not subjected to incisional biopsy or core needle biopsy due to the fear of causing fistula or tumor implantation through the needle tract.

AIMS AND OBJECTIVES

The objectives are as follows:

1. To study the frequency of various Parotid gland lesions including both neoplastic and nonneoplastic conditions.
2. To know the histological and morphological pattern of these salivary gland lesions.

MATERIALS AND METHODS

This study was conducted in the Department of Pathology, in my institute from March 2021 to April 2023. All those patients who attended surgical/ENT outpatient department and diagnosed clinically and radiographically as having various Parotid gland lesions were selected for the study. Complete clinical details including demographic details of all these patients were collected from patient/hospital records. The biopsy samples of these patients who underwent resection/excision/biopsy of parotid lesions which were received in histopathology section were labeled, fixed, and examined grossly for various details and subjected for routine tissue processing and Hematoxylin and Eosin (H and E) staining. Corresponding H and E stained slides were retrieved from histopathology section and analyzed. Data obtained were tabulated and statistically analyzed.

RESULTS

A total of 78 cases were included for our study. The age group of these patients ranged from 7 to 70 years. Majority of patients belonged to 31–50 years and the least number of cases were seen in the age group of 61–70 years. Male predominance (1.78:1) was seen in the present study.

Out of total 78 cases, 46.2% were non neoplastic lesions and 53.8% were neoplastic lesions. In

non-neoplastic lesions, predominant was chronic sialadenitis (25.5%), followed by cysts (10%).

Among neoplastic lesions, benign tumors accounted for 76% and remaining were malignant tumors (Table 3). Most common benign tumor was pleomorphic adenoma (66.7%), followed by Warthin’s tumor (9.5%). Mucoepidermoid carcinomas (9.5%) were common among malignant tumors, while least were adenoid cystic carcinoma and salivary duct carcinoma which constituted 2.6% each of all the salivary gland lesions. There was only one case of metastatic squamous cell carcinoma of parotid gland.

Table 1: Distribution of age group in salivary gland

Age group (years)	Number	Percentage
15-25	8	10.2
26-35	14	18
36-45	20	25.6
46-55	24	30.7
56-65	10	13
66-75	2	2.5
Total	78	100

Table 2-Distribution of various salivary gland lesions

Diagnosis	Number	Percentage
Acute on chronic sialadenitis	4	5.1
chronic sialoadenitis	16	20.5
cyst	8	10
Mucocele	6	7.7
Granulomatous sialoadenitis	2	2.6
Pleomorphic adrnoma	28	36
Warthins tumor	4	5.1
Mucoepidermoid carcinoma	4	5.1
Adenoid cystic carcinoma	2	2.6
Salivary duct carcinoma	2	2.6
Metastatic SCC deposit	2	2.6
Total	78	100

Table 3: Distribution of non-neoplastic and neoplastic the lesions

Lesions	Number	Percentage
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Non neoplastic	36	46.15
Neoplastic	42	53.18
Total	78	100

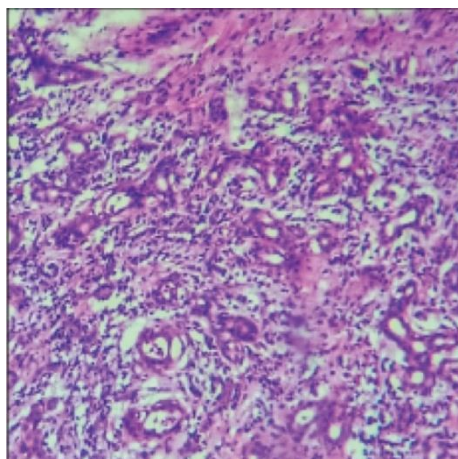


Figure 1: Microscopy of chronic sialoadenitis (10x,H&E)

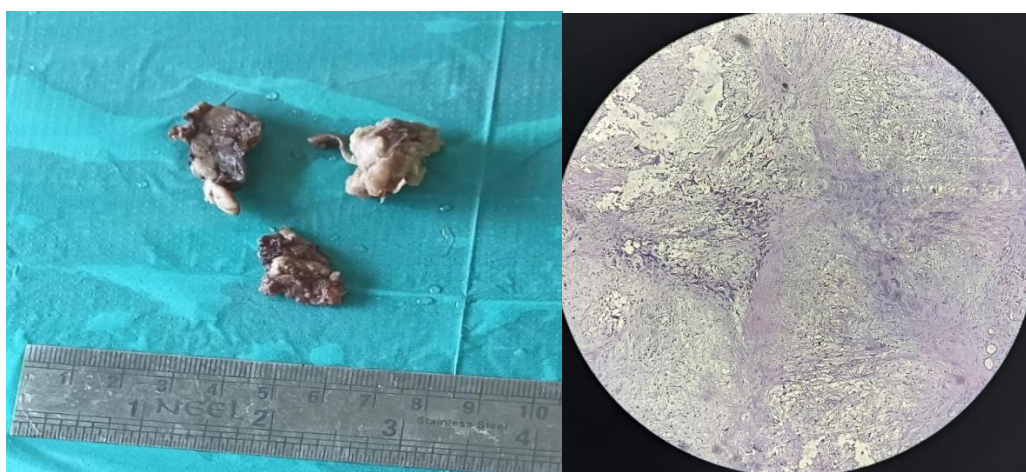


Figure 2: Gross picture & microscopic picture of pleomorphic adenoma. (10x, H&E)

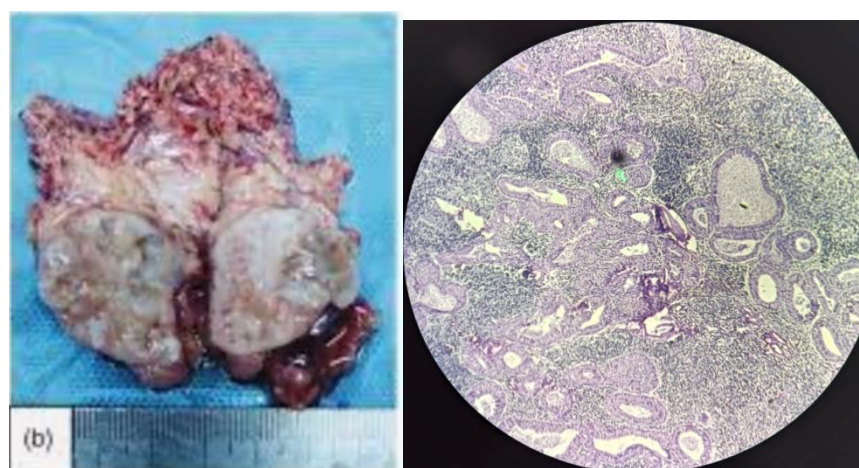


Figure 3: Gross picture & microscopic picture of Warthins tumour (10x,H&E)

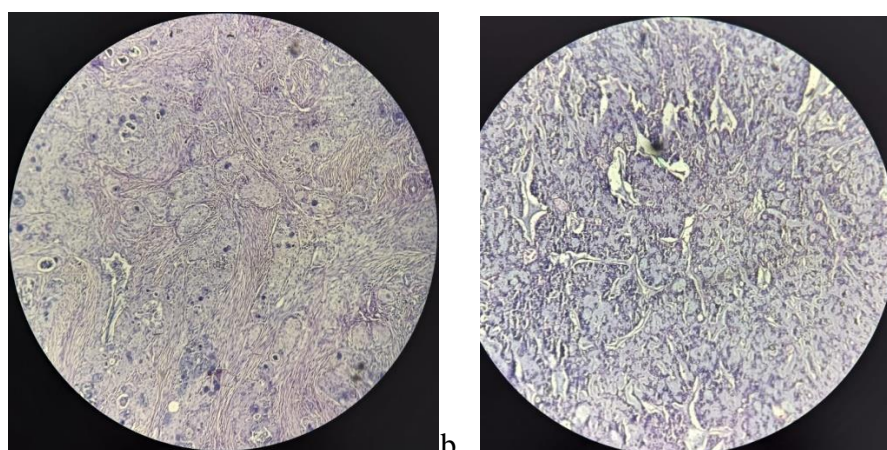


Figure 4: Microscopy of a. Mucoepidermoid carcinoma of parotid (10x, H&E) & b. Adenoid cystic carcinoma (10x H&E)

DISCUSSION

The spectrum of salivary gland lesions encompasses a broad range, with various studies reporting countless relative incidences of neoplastic and nonneoplastic lesions. These lesions in the parotid gland can generally be classified into inflammatory (both acute and chronic), non-inflammatory, and neoplastic lesions, which include benign and malignant neoplasms.

Our study found a prevalence of 53.8% in neoplastic lesions compared to 46.2% in non-neoplastic, aligning with published ranges of 40-60% observed in other studies^{7,8}. This distribution highlights the importance of considering both neoplastic and non-neoplastic etiologies during parotid gland lesion evaluation. Chronic sialadenitis emerged as the most common finding at 25.5%, mirroring its frequent occurrence reported elsewhere⁹. Factors like recurrent infections, sialolithiasis, and underlying Pleomorphic adenoma is the predominant salivary gland tumor (SGT), accounting for 60.71% of all tumors and 86.04% of benign SGTs, reflecting the consistent findings of epidemiological studies that show a marked predominance of 42%-80% of pleomorphic adenoma cases¹⁰. This tumor is typically well-circumscribed, tan-white, firm, and encapsulated, with a glistening, translucent appearance upon sectioning.

Histologically, it displays both epithelial and mesenchymal differentiation, with the epithelial component comprising well-formed ductal structures surrounded by various cell types. Warthin's tumor, identified as the second most common benign tumor at 9.5% in our study, is almost exclusively found in the parotid gland and more frequently affects males. These tumors are generally round to oval, encapsulated masses located in the superficial parotid gland, revealing a pale grey surface with tiny cystic spaces on sectioning. Mucoepidermoid carcinoma was the leading malignancy at 9.5%, reflecting its established position as the most common parotid malignancy¹¹. The presence of rarer malignancies like adenoid cystic carcinoma and salivary duct carcinoma, each at 2.6%, is in line with reported incidences¹².

Adenoid cystic carcinomas, accounting for about 10% of all epithelial salivary neoplasms, are frequently associated with the parotid gland, although some studies have suggested they are the most common malignant tumors in this region. Our study included only two cases of adenoid cystic carcinoma in the parotid gland¹³.

Furthermore, major salivary gland benign soft tissue neoplasms often encompass neural tumors, predominantly neurofibroma or schwannoma, thought to originate from the facial nerve radicals.

We acknowledge limitations in directly comparing findings across studies due to variations in geographic location and demographics, referral patterns and patient selection, and diagnostic techniques and protocols. Larger sample sizes and longer follow-up periods in future studies could offer more robust data on lesion frequency, clinical outcomes, and potential prognostic factors. Investigating specific risk factors associated with different lesion types might be valuable for prevention and early diagnosis strategies. Further research on rare malignancies is crucial to gain deeper insights into their clinical behavior, optimal management strategies, and potential targeted therapies. This study contributes to the existing knowledge base on parotid gland lesions by presenting its findings in the context of relevant research. Highlighting the diverse spectrum of these lesions underscores the crucial role of histopathological examination for accurate diagnosis and appropriate management. Continued research, addressing the limitations mentioned above, can further refine our understanding and improve patient care.

In summary, neoplastic lesions predominantly occur in the parotid gland, followed by the submandibular glands and minor salivary glands, in decreasing order of frequency. The parotid region is notably the most common site for all tumors, corroborating findings from studies conducted by Omhare et al¹⁴.and Pachori et al¹⁵.

CONCLUSION

Learning SGT is challenging as it comprises a large and varied group of lesions characterized by morphological heterogeneity. Our study concluded that neoplastic lesions are common than non-neoplastic ones and pleomorphic adenoma and chronic sialoadenitis are the most common lesions observed, respectively. Mucoepidermoid carcinoma is the frequent malignant tumor seen. Parotid region is the most common site for all the salivary gland tumors. Histopathological examination is very crucial in diagnosing non-neoplastic and neoplastic lesions of salivary glands and it is also the gold standard in accurately deciding the final clinical management of the patient.

REFERENCES

1. Dostálová L, Kalfěřt D, Jechová A, Koucký V, Novák Š, Kuchař M, Zábrodský M, Novakova Kodetova D, Ludvikova M, Kholová I, Plzák J. The role of fine-needle aspiration biopsy (FNAB) in the diagnostic management of parotid gland masses with emphasis on potential pitfalls. *Eur Arch Otorhinolaryngol.* 2020;277(6):1763-9.
2. Schwalje AT, Uzelac A, Ryan WR. Growth rate characteristics of Warthin's tumours of the parotid gland. *Int J Oral Maxillofac Surg.* 2015;44(12):1474-9.
3. Mayer M, Thoelken R, Jering M, Märkl B, Zenk J. Metastases of Cutaneous Squamous Cell Carcinoma Seem to be the Most Frequent Malignancies in the Parotid Gland: A Hospital-Based Study From a Salivary Gland Center. *Head Neck Pathol.* 2021;15(3):843-51.
4. Corvino A, Caruso M, Varelli C, Di Gennaro F, Pignata S, Corvino F, Glastonbury CM, Vallone G, Catalano O. Diagnostic imaging of parotid gland oncocytoma: a pictorial review with emphasis on ultrasound assessment. *J Ultrasound.* 2020;24(3):241-7.
5. Ronen N, Ronen S, Cochran ES, Giorgadze T. Metastatic atypical meningioma to the parotid gland - A cytopathological correlation. *Ann Diagn Pathol.* 2020;46:151521.
6. Nam I, Baek H, Ryu K, Moon J, Cho E, An H, Yoon S, Baik J. Prevalence and Clinical Implications of Incidentally Detected Parotid Lesions as Blind Spot on Brain MRI: A Single-Center Experience. *Medicina (Kaunas).* 2021;57(8):836.
7. Kumar MA, Kalahasti R, Shekhar KP. Histopathological study of non-neoplastic and neoplastic lesions of salivary gland: An institutional experience of 5 years. *Int J Sci Stud* 2017;4:69-72.
8. Mohan H, Tahlan A, Mundi I, Punia RP, Dass A. Nonneoplastic salivary gland lesions: A 15-year study. *Eur Arch Otorhinolaryngol* 2011;268:1187-90
9. Soni D, Mathur K, Yadav A, Kumar V. Histopathological spectrum of salivary gland lesions in tertiary care Centre at SMS Medical College, Jaipur, Rajasthan. *Int J Med Res* 2016;2:209-15.
10. Stanley MW, Bardales RH, Farmer CE, Frierson HF Jr., Suhrland M, Powers CN, et al. Primary and metastatic high-grade carcinomas of the salivary glands: A cytologic-histologic correlation study of twenty cases. *Diagn Cytopathol* 1995;131:37-43.
11. Dave PN, Parikh UR, Goswami HM, Jobanputra GP, Panchal NV, Shaw AM. Histopathological study of salivary gland lesions. *Int J Curr Res Rev* 2015;7:45.
12. Stanley MW, Bardales RH, Farmer CE, Frierson HF Jr., Suhrland M, Powers CN, et al. Primary and metastatic high-grade carcinomas of the salivary glands: A cytologic-histologic correlation study of twenty cases. *Diagn Cytopathol* 1995;131:37-43.
13. Chakrabarti S, Bera M, Bhattacharya PK, Chakrabarty D, Manna AK, Pathak S, et al. Study of salivary gland lesions with fine needle aspiration cytology and histopathology along with immunohistochemistry. *J Indian Med Assoc* 2010;108:833-6.
14. Omhare A, Singh SK, Nigam JS, Sharma A. Cytohistopathological study of salivary gland lesions in Bundelkhand region, Uttar Pradesh, India. *Patholog Res Int* 2014;2014:804265.
15. Pachori G, Chandra S, Bihari NA, Kasiwal N. Histopathological spectrum of salivary gland lesions in Ajmer region, Rajasthan, India. *Int J Res Med Sci* 2019;7:2708-13.