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Histopathological study of salivary gland lesions in a tertiary care center

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Abstract

Introduction: Salivary gland neoplasms constitute about 3% of all head and neck neoplasms and are relatively uncommon. Majority of the tumours are seen in the parotid gland followed by submandibular and other minor salivary glands. Histopathology is the gold standard in diagnosis of salivary gland lesions. The aim of this study was to study the frequency, site and the histopathological spectrum of salivary gland lesions in our institute

Materials & methods: This was a retrospective study done in the Department of Pathology, Kanachur Institute of Medical Sciences. Resected salivary gland specimens sent in 10% neutral buffered formalin were processed, embedded, sections cut and stained with hematoxylin and eosin stain. Gross and microscopic findings were noted.

Results: A total of 22 lesions were received during this period. Out of these 22 lesions, 16 were benign and 6 were malignant. Majority of the lesions were located in the parotid gland followed by submandibular gland. Pleomorphic adenoma was the most common benign tumour followed by Warthin's tumour. Mucoepidermoid carcinoma was the most common malignant tumour. One case was diagnosed as Lymphoproliferative disorder which on further evaluation was proven to be Non-Hodgkins Lymphoma.

Conclusion: This study showed that parotid gland was the most common site for salivary gland lesions. Benign lesions outnumbered the malignant lesions with Pleomorphic adenoma being the most common benign lesion. Mucoepidermoid carcinoma was the most common malignant lesion.

Keywords: salivary glands; parotid; benign; malignant; histopathology

Introduction

Salivary glands are classified as major and minor salivary glands. Parotid, submandibular and sublingual glands constitute the 3 pairs of major salivary gland, while the minor salivary glands are seen in the mucosa and submucosa of the oropharynx and oral cavity [1]. About 3-5% of all head and neck tumours are from the salivary glands [2]. According to the revised WHO classification (2017) salivary gland tumours account for more than 35 distinct variants [3]. 80% of the salivary gland tumours are seen in the parotid gland followed by the submandibular gland which account for about 10-15% of the tumours. Majority of the tumours are benign in nature commonest being pleomorphic adenoma constituting 70% of benign tumours [4]. Most common malignant tumour is Mucoepidermoid carcinoma [5]. Non-neoplastic lesions include inflammatory, infection, trauma, autoimmune, obstructive, metabolic and drug induced lesions [1].

Salivary gland lesions often pose diagnostic dilemmas due to their broad morphological spectrum, rarity and overlapping morphologic features among the different subtypes of tumours. Fine needle aspiration cytology (FNAC) can be used for preoperative evaluation, however histopathological examination still remains the gold standard for the final diagnosis [6]. Immunohistochemical studies can help in diagnosis

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such as to confirm the type of tumour and to confirm in situ nature in cases of intraductal carcinoma. Ki67 proliferation index helps to differentiate adenoma from carcinoma. Hence it is very important to learn the basic morphological features of each tumour types for proper diagnosis [7].

The objective of this study was to study the histopathology of salivary gland lesions received in our institute.

Materials and methods

This was a retrospective study done in the Department of Pathology at Kanachur Institute of Medical Sciences, Mangalore. The surgically resected salivary gland specimens received from March 2022 to February 2024 were studied after getting ethics committee approval. A total of 22 specimens were analysed, this study included neoplastic as well as the non-neoplastic lesions of the salivary gland. Specimens were fixed in 10% neutral buffered formalin, sections were processed and embedded in paraffin wax. Sections were cut and stained with hematoxylin and eosin stains.

Results

Out of the 22 specimens studied, 16 were benign (72.7%) and 6 were malignant (27.3%) shown in Table 1.

Table 1: Total number of benign and malignant tumours.

Tumours	*No of cases*	*Percentage*
Benign	16	72.7%
Malignant	06	27.3

The benign lesions were diagnosed as pleomorphic adenoma, Warthin's tumour, mucocele, chronic sialadenitis and granulomatous sialadenitis. The most common benign salivary gland tumour in our study was Pleomorphic adenoma (Figure 1) seen in 10 cases (62.5%) followed by Warthin's tumour seen in 3 cases (18.75%). The details of the benign cases are shown in Table 2.

Table 2: Benign salivary gland tumours seen in our study

Benign tumours	*No of cases*	*Percentage*
Pleomorphic adenoma	10	62.5%
Warthin's tumour	03	18.75%
Mucocele	01	6.25%
Chronic sialadenitis	01	6.25%
Granulomatous sialadenitis	01	6.25%

Similarly, the malignant lesions were diagnosed as mucoepidermoid carcinoma, adenoid cystic carcinoma, salivary duct carcinoma (SDC) and lymphoproliferative disorder which on further evaluation was confirmed to be non-Hodgkin's lymphoma (NHL). The most common malignant tumour in our study was mucoepidermoid carcinoma (Figure 2) seen in 3 cases (50%) followed by 1 case each of adenoid cystic carcinoma (16.7%), salivary duct carcinoma (16.7%) and NHL (16.7%). The details of the malignant cases are shown in Table 3.

Table 3: Malignant salivary gland tumours seen in our study

Malignant tumours	*No of cases*	*Percentage*
Mucoepidermoid carcinoma	03	50%
Adenoid Cystic carcinoma	01	16.7%
Salivary duct carcinoma	01	16.7%
Non Hodgkins Lymphoma	01	16.7%

In our study the most commonly involved gland was parotid gland followed by submandibular gland. NHL (Figure 3) and SDC are rare tumours accounting for 2% and 5% of all salivary gland tumours respectively. Immunohistochemistry helps in differentiating lymphoma from carcinomas. In our study IHC was done on one case reported as NHL. We used LCA to confirm lymphoid origin and panCK to rule out carcinoma (Figure 4a & 4b). SDCs are most aggressive tumours with high rates of local recurrence and distant metastases. These tumours mainly affect men and are commonly seen in major salivary glands especially the parotid gland. One case of SDC (Figure 5a & 5b) in our study was seen in a male who came with complaints of parotid swelling.

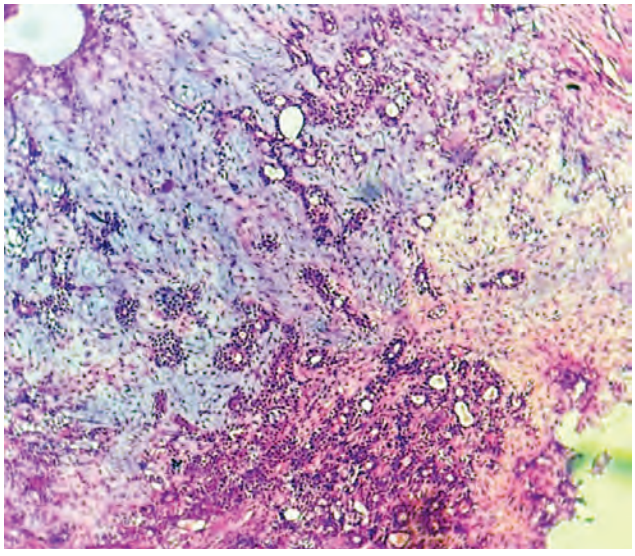

Figure 1: Pleomorphic adenoma showing epithelial cells arranged in cords, tubules and acini, myoepithelial cells and chondromyxoid stroma, (H&E stain, 10x).

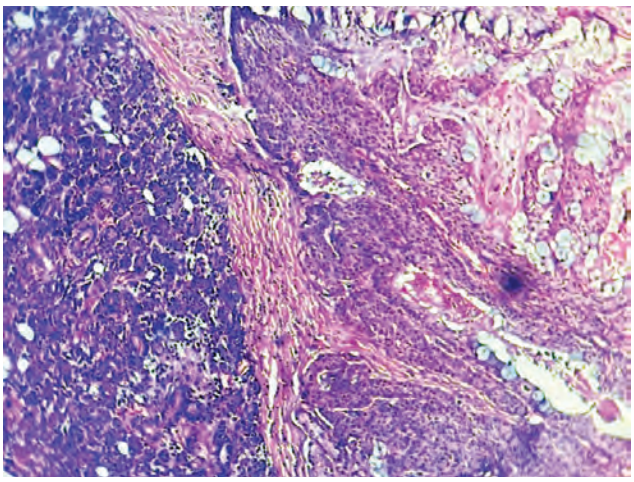

Figure 2: Mucoepidermoid carcinoma showing neoplastic squamous cells arranged in nests and clusters, mucus cells and intermediate cells, (H&E stain,10x).

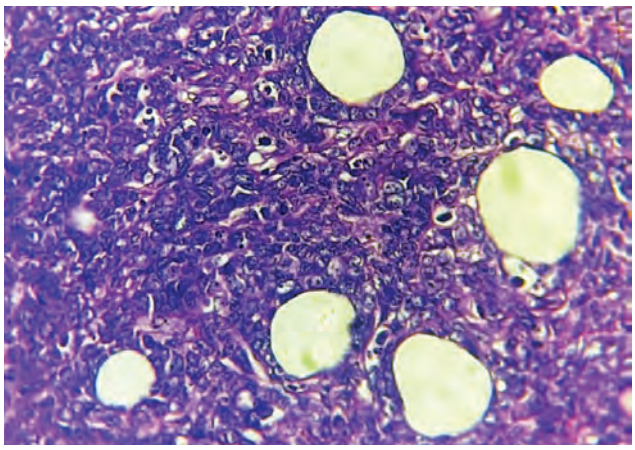

Figure 3: Submandibular gland completely replaced by monomorphic population of lymphoid cells diagnosed as non-Hodgkins lymphoma. Mitotic figures are also seen, (H&E stain, 40x).

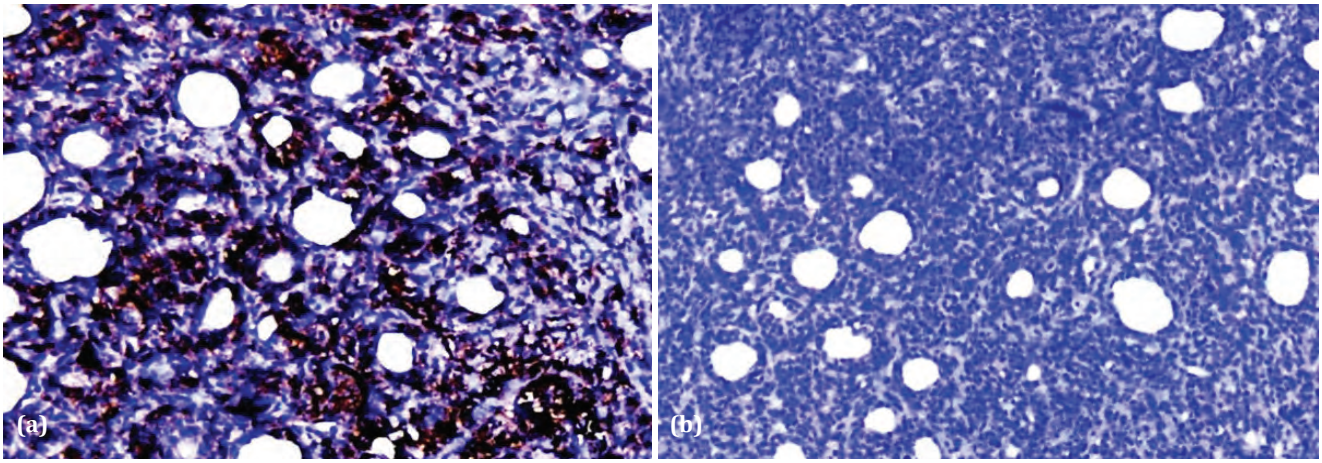

Figure 4: (a) Immunohistochemistry showing the monomorphic lymphoid cells positive for LCA and negative for panCK markers (b) confirming the diagnosis of non-Hodgkins lymphoma.

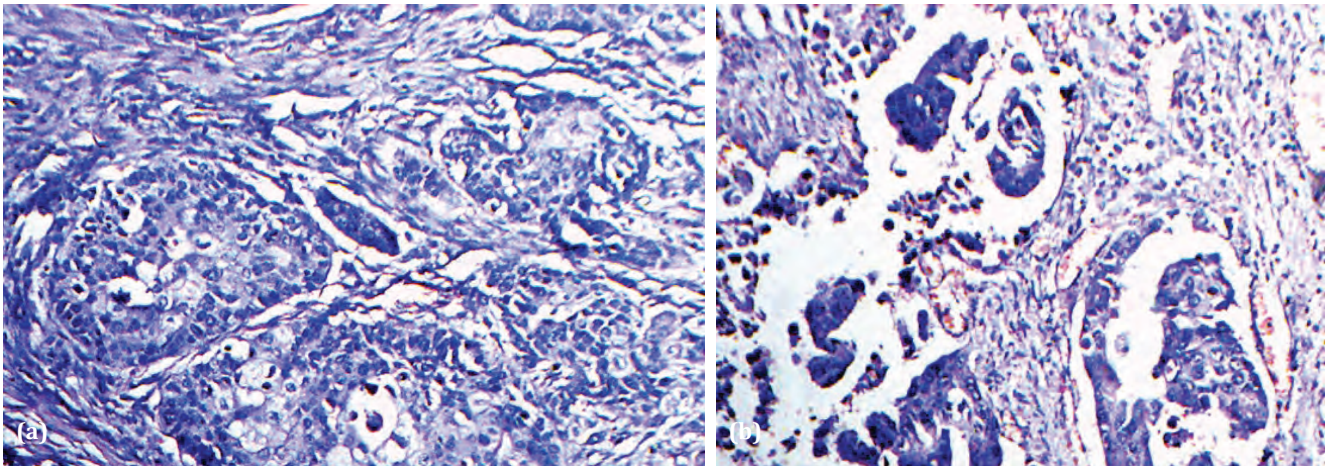

Figure 5a, b: Microscopy showing pleomorphic tumour cells resembling invasive ductal carcinoma arranged in cribriform growth pattern.

Discussion

Salivary gland lesions are uncommon and difficult to diagnose due to their variable morphological and histopathological appearances. Most commonly these lesions present as a painless growing mass and are classified broadly into neoplastic and non neoplastic [8]. Differentiating benign salivary gland tumours can be challenging as they can be multifocal, lack capsule or both. Malignant tumours maybe be encapsulated

or well circumscribed in early stages or can be cytologically bland. Therefore, histopathology is of utmost importance and a good knowledge of salivary gland histomorphology is essential [9].

Our study has shown that benign tumours were more common than malignant tumours which is correlating with the studies done by Srinivasan et al [6], Theresa et al [10], Ali et al [11]. In this present study Parotid gland was the most common site of salivary gland lesions which was similar to studies done by Srinivasan et al [6], Cherian et al [12], Patel [7]. Pleomorphic adenoma was the commonest benign tumour similar to studies done by Srinivas et al [6], Therasa et al [10], Cherian et al [12] and Patel et al [7]. These tumours are composed of epithelial and myoepithelial cells within a connective tissue stroma. Immunohistochemical studies have shown Pleomorphic adenoma to be a pure epithelial tumour even though it's called a mixed tumour [8]. The second most common benign tumour was Warthin's tumour which was found only in males. This corroborates the fact that Warthin's tumour has a male preponderance. These tumours are more commonly seen in elderly individuals with a peak incidence in the sixth decade. On microscopy, cysts lined by basaloid oncocytic cells with columnar epithelial cells is seen. Surrounding areas show lymphoid stroma including germinal centres [13]. This is similar to the studies done by Cherian et al [12], Bobati et al [13] and Patel et al [7].

It was observed that Mucoepidermoid carcinoma was the commonest malignant tumour similar to studies done by Srinivasan [6], Therasa et al [10], Sabrinath et al [8]. Microscopically, mucoepidermoid carcinomas show varying proportions of epidermoid, mucous and intermediate type of cells with mucin filled cystic lumens and pools of extravasated mucin in the surrounding tissues which stain positive for mucicarmine [7, 13]. Single case of adenoid cystic carcinoma was seen which constitutes 2% of all salivary gland tumours. These tumours are mainly seen in the parotid gland usually in women aged between 50-70 years of age [7].

Rare tumours such as NHL and salivary duct carcinoma (SDC) were also seen in our present study. Most of the lymphomas affecting salivary glands are B cell lymphomas while primary T cell lymphomas are rare [14]. Immunohistochemical studies help in determining whether a tumour is B cell lymphoma, T cell lymphoma or a carcinoma by using the markers CD20+, CD3+ and keratin+ respectively [15]. Salivary duct carcinomas are aggressive epithelial tumours resembling high grade invasive ductal carcinoma characterised by proliferation of tumour cells with a cribriform pattern and comedonecrosis. Although histologically similar to breast carcinoma, SDC shows marked cellular atypia and increased mitosis [16].

Limitations of this study include a limited number of cases available for each tumour type as the study was done in a tertiary care centre in limited patients and hence is inadequate to provide conclusive data.

Conclusion

The present study showed that salivary gland lesions show a varied histomorphological appearance. Therefore, proper diagnosis needs consideration of histological findings to differentiate benign and malignant neoplasms. The most commonly observed benign and malignant salivary gland neoplasms are pleomorphic adenoma and mucoepidermoid carcinoma respectively, while other rare cases like salivary duct carcinoma and Non Hogdkins lymphoma can also be seen.

Conflicts of interest

Authors declare no conflicts of interest.

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