Original article

Histopathologic spectrum of salivary gland neoplasms

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Abstract:

Introduction: Salivary gland tumours are rare and most cases are referred to the head and neck clinic. The majority of these neoplasms are benign. Tumours can occur in both major and minor salivary glands. 80% of major salivary gland tumours occur in the parotid glands, while most minor salivary tumours are located in the palate. As a general rule in clinical practice, the smaller the salivary gland is, the more likely the tumour is malignant. Selected tumour entities likely to be encountered or to present diagnostic difficulty in general practice will be addressed in detail.

Materials & Method: This is observational, cross-sectional study which had been done from August 2014 to July 2015 in the Pathology Department of Kamineni Institute of Medical Sciences. A detailed history including, age, sex, residence, occupation and the clinical symptomatology were taken. FNAC were done in all patients suspected of having a salivary gland tumor in the cytology section of the Department of pathology of Kamineni Institute of Medical Sciences.

Results: We got 27 salivary gland tumors, out of which 14 cases are Pleomorphic salivary adenoma, 4 cases due to Basal cell adenoma, 3 cases due to Mucoepidermoid carcinoma, 2 cases of Adenoid cystic carcinoma and each 1 case of Lipomatosis, Salivary duct adenocarcinoma, Warthin’s tumor & sclerosing polycystic adenosis.

Key words: Salivary gland, pleomorphic adenoma, Adenoid cystic carcinoma, Mucoepidermoid carcinoma, Warthin’s tumor.

Introduction

Salivary gland tumours can show a striking range of morphological diversity between different tumour types and sometimes within an individual tumour mass. In addition, hybrid tumours, dedifferentiation and the propensity for some benign tumours to progress to malignancy can confound histopathological interpretation. These features, together with the relative rarity of a number of tumours, can sometimes make diagnosis difficult, despite the abundance of named tumour entities. The increasing use of pre-operative fine needle aspiration biopsies also needs to be taken into account, as artifactual changes may be superimposed on the tumours. Between 64 and 80% of all primary epithelial salivary gland tumours occur in the parotid gland with most located in the superficial (lateral) lobe; benign tumours represent 54-79%, and 21-46% are malignant tumours[1]. The incidence of malignant tumours rises to 40% in submandibular gland and 90% in case of sublingual glands. The minor glands are dispersed throughout the upper aero-digestive sub-mucosa (i.e. palate, lip, pharynx, nasopharynx, larynx, para-pharyngeal space). [2-4]. 60-80% of all minor salivary gland tumors found to be malignant [5]. It is the general rule in clinical practice that smaller the size of salivary gland is, more likely the tumor is malignant. Benign tumor of salivary gland occurs in the age range between 30-70 years while peak incidence of malignant salivary gland tumor occurs in 6th & 7th decades [6].
Incidences of malignant tumors are more common in women compared to men [7, 8].

The etiology of salivary gland tumors are quite unclear, while smoking and drinking are strongly correlated with other head & neck tumors these do not play a role in salivary gland tumors[1] with the exception of a greatly increased risk and association of smoking with Warthin's tumour[9]. History of previous cancers, related to Epstein-Barr virus, immunosuppression, and radiation are also associated with an increased risk of salivary gland cancer [1].

Endogenous hormones have been reported in normal and neoplastic salivary glands, but some of the results have been conflicting. Estrogen receptors have been reported in a minority of cases of acinic cell carcinoma, mucoepidermoid carcinoma and salivary duct carcinoma but were not detected in adenoid cystic carcinoma. Estrogen or estrogen receptors have been reported in pleomorphic adenomas in some studies. Progesterone receptors have been reported in normal salivary glands. They have been detected in a minority of pleomorphic adenomas but high levels of expression were reported in recurrent pleomorphic adenomas and this was thought to be a prognostic factor.

Salivary gland tumours in the parotid or submandibular glands usually present as an enlarging mass. This may be associated with neurological symptoms such as facial nerve paralysis or pain if the tumour is malignant. Minor salivary gland tumours present as a sub mucosal intraoral mass which subsequently ulcerates. Clinical features suspicious for malignancy include ipsilateral facial nerve palsy, sudden tumour growth, pain, tumour fixation to the overlying skin or underlying muscle, and cervical lymphadenopathy [1].

Aims and Objectives: To find out histopathological changes of different salivary gland tumors.

Material & Methods
This is observational, cross sectional study which have been done from August 2014 to July 2015 in the Pathology Department of Kamineni Institute of Medical Sciences with the collaboration of Department of General Surgery and department of ENT of Kamineni Institute of Medical Sciences. We included all the patients who underwent salivary gland tumors operation in this institute within the stipulated time period. A detailed history including, age, sex, residence, occupation and the clinical symptomatology was taken. FNAC was done in all patients suspected of having a salivary gland tumor in the cytology section of the Department of pathology of Kamineni Institute of Medical Sciences.

Results
In our study we got 27 salivary gland tumors, out of which 14 cases are Pleomorphic salivary adenoma, 4 cases due to Basal cell adenoma, 3 cases due to Mucoepidermoid carcinoma, 2 cases of Adenoid cystic carcinoma and each 1 case of Lipomatosis , Salivary duct adenocarcinoma, Warthin’s tumor & sclerosing polycystic adenosis. [Table-1].
Table-1: Different histopathological findings of salivary gland tumors.

<table>
<thead>
<tr>
<th>Histopathological Findings</th>
<th>Number of case (27)</th>
</tr>
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<tbody>
<tr>
<td>Pleomorphic adenoma</td>
<td>14 (51.85%)</td>
</tr>
<tr>
<td>Basal cell adenoma</td>
<td>04(14.81%)</td>
</tr>
<tr>
<td>Mucoepidermoid carcinoma</td>
<td>03(11.11%)</td>
</tr>
<tr>
<td>Adenoid cystic carcinoma</td>
<td>02(07.40%)</td>
</tr>
<tr>
<td>Warthin’s tumor</td>
<td>01(03.70%)</td>
</tr>
<tr>
<td>Lipomatosis of salivary gland</td>
<td>01(03.70%)</td>
</tr>
<tr>
<td>Salivary duct adenocarcinoma</td>
<td>01(03.70%)</td>
</tr>
<tr>
<td>Sclerosing polycystic adenosis</td>
<td>01(03.70%)</td>
</tr>
</tbody>
</table>

Fig 1a: Show pleomorphic adenoma of salivary gland.
Fig 1b: Show Cellular pleomorphic adenoma of salivary adenoma.

Fig 2: Histopathology of basal cell adenoma.
Fig 3: Show Warthin’s tumor with double cell layers and lymphoid stroma.

Fig 4: Show epidermoid, mucinous cells in mucoepidermoid carcinoma.

Fig 5: Show salivary duct adenocarcinoma.
Fig 6a: Encapsulated tumour, normal salivary tissue with sclerotic stroma.

Fig 6b: Cyst wall, sclerotic stroma and many cystically dilated glands.

Fig 7: Show histopathology of lipomatosis.

**Discussion**

Only a limited numbers of research article based on salivary gland tumors have been published from India until now. The epidemiology of salivary gland tumors is not well documented. In many studies the data are limited, as some are restricted to parotid gland neoplasms or tumors of major glands. The global annual incidence when all salivary gland tumors were considered varied from 0.4-13.5 cases per 100,000 populations. In the United States, salivary gland malignancies accounted for 6% of head and neck cancers, and 0.3% of all malignancies [7, 8, and 10]. There is also some geographic variation in the frequency of tumor types. Mostly all of primary salivary gland tumors occur in parotid gland with common location being the lateral lobe. The average ages of patients with benign and malignant tumors are 46 and 47 years, respectively, and the peak incidence of most of the specific types is in the sixth and seventh decades [11]. In this study most of the patient being in the age group of 4th to 6th decades.
with male female ratio being 1:1.5. These epidemiological findings are mostly similar to the findings of other observer [12, 13]. Benign tumor mostly outnumber malignant one, & most common clinical presentation of patient is painless gradual swelling. Similar observations were made by Loke.-Wallace et.al [12] reported the range of tumor size in his series to be 1.8-4cm whereas Sharkey [6] reported a mean size ranging from 0.5 - 7cm. In the present series, mean tumor size ranged from 0.8cm - 2.5cm.

Pleomorphic adenoma is most common salivary gland neoplasm; most frequently occur in women than men with most prevalent between 4th - 6th decades. Most of patient clinically present with painless swelling. It may occur in bronchus, nasal cavity, skin (chondroid syringoma), breast, soft tissue. Grossly the tumor ranges from few millimeters to centimeters with well encapsulation. Cut surface may be fleshy, rubbery or glistening. On microscopic examination the tumor show epithelial component may be arranged in tubules, cysts, ribbons, solid sheet. The cells columnar, cuboidal or flat. Duct of lumen empty or contain eosinophilic material which is PAS positive diastase negative. Myoepithelial cells may appear as cuboidal, spindle, stellate, plasmacytoid appearance. Extracellular stroma is one of the striking components of this tumor. Stroma may take in the form of chon droid, myxoid, chondromyxoid, hyaline and very rarely osseous or adipose tissue. [Fig-1]

Basal cell adenoma is another benign tumor of salivary gland composed of basaloid cells which is sharply delineated from stroma by basement membrane. Clinically most of patient present with asymptomatic, painless, slowly growing mass. Grossly this tumor well circumscribed with or without fibrous capsule. Histologically small basaloid cells having round basophilic nucleus, scanty cytoplasm arranged in tubular or trabecular pattern. Cells are separated from stroma by basement membrane. Peripheral palisading is seen. [Fig-2]

Warthin’s tumor is also known as papillary cyst adenoma lymphomatosum is second most common tumor of salivary gland. It is more common in men compared to women with highest peak in incidence between 6th to 7th decades. Patient may present with cystic swelling in lower pole of parotid gland with wide variety of signs and symptoms- asymptomatic mass, pain, facial weakness, earache, tinnitus, deafness, and rarely facial nerve palsy may be seen. Grossly tumor is well circumscribed, spherical to ovoid mass, cut surface of the tumor show variable sizes cystic spaces. Histological examination epithelial component often form papillary projections into the cystic structure. Epithelium contains two layers- luminal layer is oncocytic columnar cells which are supported by basal cells. The lymphoid stroma closely resembles a normal lymph node, with lymphoid follicles and follicular centers. [Fig 3]

Adenoid cystic carcinoma is previously known as cylindroma commonly occur in 4th to 6th decades of life with female predominance. The tumor extends well beyond the visible and palpable limit of the lesion thus infiltrative nature of this carcinoma is well established. Facial pain and nerve involvement are two common clinical presentation of this tumor. On histological examination three patterns are noted- cribriform, tubular and solid. In cribriform or classic form epithelial cells form small cylindrical configurations. Lumen of these spaces contains PAS positive mucopolysacharides. In tubular form lining cells are stratified cuboidal epithelial cells. Solid variant is least common type, in most of cases local invasion and perineural invasion by these tumors is noted.
Mucoepidermoid carcinoma most commonly occurs in parotid gland and minor salivary gland. Women are affected slightly higher compared to men with peak age 5th decades. These are slow growing well encapsulated tumor. Nerve involvement is not seen in low grade tumor while it is quite common in high grade tumor. On histological examination three types of cell are found- epidermoid cell, mucus secreting cells and intermediate cells. Individual cell keratinization and intercellular bridge are seen in epidermoid cell. Mucus secreting cells contain intracellular neutral and acid mucopolysacharides. [Fig-4]

Salivary duct adenocarcinoma is a rare tumor commonly occurs in parotid gland of a middle aged and elderly person. It is believed to arise from excretory ducts or as a malignant transformation of ductal cells in a pleomorphic adenoma. Patient show initial feature of mass and facial nerve palsy. Local and distant metastasis of these tumors is quite common and prognosis is very unfavorable. The intraductal carcinoma-like component of this tumor, imparting a similarity to ductal carcinoma of the breast. Intraductal component of these tumor contain papillary, comedo and cribriform like pattern. Infiltrating carcinoma has papillary or undifferentiated pattern. Tumor cells have are large hyerchromatic pleomorphic nuclei with moderate to abundant eosinophilic cytoplasm. Mitotic figures are quite common. [Fig-5]

Sclerosing polycystic adenosis in the major salivary glands usually present with slow growing, deep seated, rounded, palpable mass with or without pain and tenderness whereas in minor salivary gland it usually present with asymptomatic freely mobile nodule with white, creamy or yellow in colour. Histologically sclerosing polycystic adenosis is a sharply circumscribed, poorly encapsulated with acinar and ductal components with more prominent fibrosis is noted. Other feature like apocrine like metaplasia, cribriform pattern, clear cell changes, squamous and oncocytic like changes are observed. The pathogenesis of sclerosing polycystic adenosis is uncertain. Most of the histological feature such as sclerotic fibrosis, epithelial proliferation point towards reactive post inflammatory process. However mild to moderate cellular atypia and carcinoma in situ are observed by some authors. [14] [Fig-6]

In case of liomatosis of salivary gland there is diffuse deposition of adipose tissue (usually throughout salivary gland) with overall enlargement of gland but no distinct mass can be fell by clinically. It is commonly associated with alcoholism, cirrhosis of liver, diabetes, hormonal abnormalities, and malnutrition. It may be preceded by sialadenosis (acinar cell hypertrophy, interstitial edema, ductal atrophy). Tumour is slow growing, usually affect parotid gland, may affect children. [Fig-7]

Conclusion
Salivary gland tumours most often present as painless enlarging masses. Most are located in the parotid glands and most are benign. The principal hurdle in their management lies in the difficulty in distinguishing benign from malignant tumours. Investigations such as fine needle aspiration cytology and MRI scans provide some useful information, but most cases will require surgical excision as a means of coming to a definitive diagnosis. Benign tumours and early low-grade malignancies can be adequately treated with surgery alone, while more advanced and high-grade tumours with regional lymph node metastasis will require postoperative radiotherapy.
References: