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SALIVARY GLAND TUMORS

An Essay

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INTRODUCTION

INTRODUCTION

Although tumors of the salivary glands comprise less than three percent of all neoplasms in the head and neck region, they are of unusual interest and challenge to the surgeon because of their complex and varying array of histologic types and their regional anatomic relationships. Their incidence is approximately 1.5 to 2 per 100,000 population.

The salivary glands are usually divided into two groups, the major salivary glands, which are the paired parotid, submandibular and sublingual glands; and the minor salivary glands, which are located in the mucous membrane of the respiratory tract and upper digestive tract. Approximately 80 to 85 percent of all salivary gland neoplasms occur in the parotid gland, 10 to 15 percent in the submandibular gland and approximately 5 percent in the sublingual and minor salivary glands. In the term of malignancy, in general, as the size of salivary gland decreases, the incidence of malignancy increases.

Another peculiar behavior of the salivary neoplasms is that one summarized by *Ackerman* (1962): "The usual tumor of salivary gland is a tumor in which the benign variant is less benign than usual benign tumor and the malignant variant is less malignant than the usual malignant tumor".

PATHOLOGY

PATHOLOGY OF SALIVARY GLAND TUMORS

At the turn of the present century, despite their characteristically rather pronounced variation in histological appearance, all the salivary gland tumors were simply separated into infiltrating and encapsulated types. With considerable delay until the fifth decade of the century, with improvement of surgical and anaesthetic techniques, advent of antibiotics, revived the role of surgery for both benign and malignant tumors of the salivary glands (***Batsakis, 1979***). The delay was occasioned by the relative rarity of these tumors and the policy of expectant treatment considered by McFareland in 1933, that surgical treatment of salivary tumors was unnecessary. Again the lack of a universally accepted classification of the salivary tumors added another difficulty contributing to the delay. (***Batsakis, 1979***)

Perhaps no tissue in the body is capable of producing such a diverse histopathological expression as in the salivary tissue this may be - in part - due to the presence of myoepithelial cells in the salivary tissue. However the presence of facial nerve within the parotid gland makes another uniqueness, which is a great difficulty in the treatment of tumors of the parotid gland. The whole situation is summarized by ***Acherman and Del Regato (1962)*** by the fact that the usual tumor of the salivary gland is a tumor in which the benign variant is less benign than the usual benign tumors and the malignant variant is less malignant than the usual malignant tumors. For this unique

biological behavior, the prognosis of salivary gland tumors is expressed in 20 years rather than five or ten years term.

(*Acherman and del Regato, 1962*)

Table 1:

Percentage frequency of all primary epithelial salivary tumors and the percentage of malignant tumors analysed by site.

Site	Absolute number	Percentage frequency	Percentage malignant
Parotid	1756	72.9	14.7
Submandibular	257	10.7	37.0
Sublingual	7	0.3	85.7
Minor glands	336	14.0	46.4
Unknown	54	2.2	

From Eveson and Cawson (1985)

Incidence of Salivary tumors:

Eneroth (1971) found that about 85 percent of salivary gland tumors were located in the parotid gland and that about six percent were located in the submandibular gland. Benign tumors represent more than four fifths of the parotid gland tumors. However palatine salivary tumors are about half malignant (*Batsakis, 1979*). According to *Eneroth (1970)* one of six of parotid tumors, one of three of submandibular tumors and half of palatine tumors will be malignant. *Baker et al (1966)* reported that about ten percent of all malignancies of the head and neck

are located in the salivary glands. Table (1) show the percentage frequency of all primary epithelial salivary gland tumors and the percentage of malignant tumors analysed by site, from *Eveson and Cawson (1985)*.

Sex Distribution:

Eveson and Cawson (1985) noticed female predominance maximal in the eighth decade (1.6:1) and ninth decade (1.9:1). This predominance was noticed by a smaller series by *Jarson and Schmidt (1958)* but only in benign tumors.

Age Incidence:

The peak incidence of benign tumors of the salivary glands is in the sixth decade, but the peak incidence of malignant tumors was in the seventh decade. The ratio of benign to malignant tumors appears to decrease with age after the first two decades, being maximum in the third decade where nearly 95% of salivary tumors were benign. In the seventh and eighth decades only 70% of total tumors were benign. (*Eveson and Cawson, 1985*)

However the age of primary treatment is about 45 years old as reported by *Batsakis (1979)*. No age is immune as regard salivary tumors, and a mixed tumor was reported in an eight months old infant by *McFareland* in (1943). (*Larson and Schmidt, 1958*)

Racial and Geographic Distribution:

In spite of the fact that the overall incidence of salivary tumors is the same throughout the world, there is however an influence of geography in the distribution of the tumor. African negroes present more with mixed salivary tumors of the minor salivary glands (*Eneroth, 1970*). In Peretorea the incidence of mixed salivary tumors of the parotid gland is about four and half times in the caucasian population than in negroes (*Batsakis, 1979*).

Predisposing Factors Related to Salivary Tumors:

A growing body of information points to a relation between salivary tumors and head and neck irradiation. A large study by Michael Reese group relate the occurrence of salivary tumors to accidental irradiation of the head and neck for diagnostic purposes and for treatment of benign tumors. A latent period, average 1 to 20 years or more was suggested after postnatal irradiation to infants, a similar latent period was noticed after atomic bomb survivors in Japan (*Schneider et al, 1977*). The parotid gland is the salivary tissue site in about 3/4th of the reported cases. Most of the irradiation induced salivary tumors was of the benign variety, the mixed salivary tumors account for about half of the irradiation related tumors, the mucoepidermoid carcinoma is the most common reported malignancy following head and neck irradiation. (*Schneider et al, 1977*)

Berg et al (1968) followed up 396 cases of carcinoma of the major salivary glands and reported an interesting association,

that the subsequent incidence of breast cancer was eight times the expected figure. This incidence is greater than the known risk of second breast cancer developing in a patient who has already a mammary carcinoma. (Berg et al, 1968)

Histogenesis of Salivary Tumors:

The current classification of salivary tumors is based upon the ability of the neoplastic cells to mimic its cell of origin morphologically and functionally. It was suggested that the basal acini of the excretory cells give rise to the columnar and the squamous cells of the excretory ducts while the intercalated duct cells give rise to acinar cells, other intercalated duct cells, striated duct cells and probably the myoepithelial cells (Batsakis, 1979). There are two possibilities, the first is that the genesis of the salivary neoplasm is from their adult differentiated counter parts of the histological salivary tissue unit, so acinar cell carcinoma would arise from acinar cells, oncocytic tumors from striated duct cells, squamous cell carcinoma and mucoepidermoid carcinomas from excretory cells. The second possibility is that the neoplasm would generate from two undifferentiated "reserve cells", the basal and intercalated duct cells and so the "Bicellular theory of origin" of the salivary tumors was the name given for it. (Batsakis, 1979)

Classification of Salivary Tumors

Prior to 1953, and the work of Foote and Frazell (1953) many kinds of salivary gland tumors were reported and grouped together

under Vague designations such as semimalignant. As a result, many patients were radically operated upon unnecessarily. On the other hand, many patients died of their tumors because of false benign identification. In many cases it is difficult to draw a line between the benign and the malignant lesions from their histopathological picture. (Batsakis, 1979)

Most classification systems used today are modifications of the system developed by Foote and Frazell in 1953. Table (2) show the World Health Organisation's classification of salivary gland tumors according to **Thackary and Sobin (1972)**. It is to be compared by that suggested by table (3) by Foote and Frazell and table (4) by Batsakis 1977. Table (5) provides a relatively simple and practical scheme that should be equally useful to and applicable by clinicians and pathologists.

T N M Classification for Malignant Salivary Tumors

Retrospective studies have indicated that numerous factors affect the prognosis including histogenic diagnosis, tumor grade, size, degree of fixation or local extension and nerve involvement. The status of regional lymph nodes, and the presence of distant metastases are also of major significance. The classification in table (6) involves only four clinical variables, the tumor size, significant local extension, evidence of nodal involvement and distant metastases.

The significant local extension is defined as clinical or pathological evidence of tumor involvement of the skin, soft tissues, bones, or the lingual or facial nerves. (Baker, 1983)

Staging of Carcinoma of Salivary Glands

This staging system is based on extensive retrospective reviews of cancer of the major salivary glands, the parotid gland, the submandibular, sublingual glands (Levitt et al, 1981). This staging does not apply to tumors of the minor salivary glands, mucus secreting glands found in the upper aerodigestive tract. A clinical-diagnostic staging (C.TNM) is possible for salivary gland tumors after the diagnosis is established by biopsy. However the post surgical treatment pathological staging (P.TNM) is the most frequently used, table (7).

WHO Classification of Salivary Tumors:

1- Epithelial tumors

A. Adenoma

1- Pleomorphic adenoma (mixed tumors)

2- Monomorphic adenoma

a- Adenolymphoma

b- Oxyphylic Adenoma

c- Other types

B. Mucoepidermoid tumors

C. Acinic cell tumors

D. Carcinoma

1- Adenoid cystic carcinoma

2- Adeno carcinoma

3- Epidermoid carcinoma

4- Undifferentiated carcinoma

5- Carcinoma in pleomorphic adenoma

(Malignant mixed tumor)

2- Non epithelial tumors

3- Unclassified tumors

4- Allied conditions

E. Benign lymphoepithelial lesions

F. Sialosis

G. Oncocytosis

Table (2)

(Thackary and Sobin, 1972)