

A PATHOLOGICAL STUDY OF BENIGN AND MALIGNANT TUMOURS OF SALIVARY GLANDS

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ABSTRACT

Interest in the knowledge of salivary gland tumours is highlighted. A sample of 315 cases, collected over a period of 25 years in a busy pathology centre, is analysed both on total and individual aspects of tumours. The findings are compared to earlier works on the subject and also with contemporary literature.

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KEY WORDS :Pathological study; Salivary tumours.

Introduction

Tumours of salivary glands have continually interested the medical profession, pathologists in particular because of a number of peculiarities of the subject. These peculiarities are : (i) their diverse histological forms (ii) unpredictable clinical behaviour (iii) and different opinions expressed by several workers of long experience on different aspects of these tumours. In developing countries like India, where malnutrition is still a reckonable ill of society, these tumours are said to be commoner, their locations are rather more unusual, and their vulnerability to malignancy is more than in developed countries [1,2]. Incidence of salivary gland tumours has been reported differently by several workers in this field. It is estimated at 0.5 to 2 percent of all neoplasia [3-5]. Overall incidence of these tumours in different geographical locations is substantially the same except in Canada, where the condition is unusually prevalent in excess among Eskimos [6]. Location wise, Parotid gland is involved in about eighty percent (80%) of salivary tumours, however it is reported that the Chinese origin Malaysians show great preponderance for submandibular glands [1], Ugandans over palate [2] and people of West Indies over the sublingual and minor salivary glands [7]. However a number of Indian authors have recorded the incidence of parotid gland involvement at a lower level viz. fifty percent (50%) [8] and sixty four percent (64%) [10]. About twelve percent of all salivary gland tumours arise in the lachrymal gland and the mucous glands of the inner surface of the upper lip, palate, base and borders of tongue, nasopharynx, larynx and accessory nasal sinuses [11,12].

Diversities of phenomenology of tumours of sali-

vary glands are best illustrated by the fact that till date several classifications have been attempted. Starting from Ewing 1928 [13], there have been at least six such attempts to encompass the whole subject, till Thackray and Sobin [14] gave a histological typing on behalf of WHO (Geneva WHO 1972). Though this classification is currently being followed by majority of centres, this is not the end of it. Many queries are still to be cleared. As late as 1988 a fresh classification was brought out by Ellis and Gnepp, 1988 [15] and which is currently being followed by the Armed Forces Institute of Pathology (AFIP) [16]. This classification brings out 10 varieties of benign tumours and 18 types of malignant tumours. Such is the diversity of the subject.

Histogenesis of the salivary tumours still remains elusive. Several hypothesis have been postulated to cover the varied histological picture. At last Crumpler et al, 1976, [17] after a brilliant study with electron microscopy, tissue culture and histochemistry have shown that in the myxomatous and chondromatous areas of the mixed tumours are mostly myoepithelial cells. The matter is still open for further studies.

In view of the diversities of these tumours in different aspects, it was thought that a larger sample for study on the subject, with both retrospective as well as prospective analysis will be a useful addition to the current knowledge in this field.

Material and Methods

Sample of the study covered : a) all the cases worked on in the Department of Pathology, Medical College, Jabalpur (M.P), India, during 1967 to 1990, i.e. for a period of 23 years. Paraffin embedded tissue sections, kept in the Histology Section, along with records of these surgically resected tumours, was the material for retrospective analysis. Total number of such cases was 306.

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b) Six cases from the same department and three cases from Military Hospital, Jabalpur, obtained from surgical sections during one year period, 01 April 91 to 31 March 92, i.e. a total of 9 cases was the material for prospective analysis. Thus the total material for study was 315 cases. All these cases were studied in detail as regards their clinical, morphological and histological features.

i) Clinical study covered particulars of subjects, their age, sex, duration of growth and associated clinical features.

ii) Morphological characteristics of the tumour were recorded under the following headings : size, consistency, external appearance

iii) Histological studies were done by microscopic study of Haematoxyline and Eosin stained tissue sections as per standard procedure. Special stains were used as and when necessary. Histological classification of these tumours was done as per classification criteria of WHO (1972) [14].

Observations

As mentioned earlier, this study covers a period of 23 years (1967-1990). During this period a total number of 33, 109 neoplastic specimens were received by the department. Salivary neoplasms numbered 315, constituting 0.95 percent of all neoplastic specimens. Of the total salivary tumours, 192 (61%) were benign tumours while 123 (39%) were malignant (Table-1 shows frequency of occurrence of different types of tumour).

TABLE 1
Frequency of tumours (n=315)

Type of tumour	Number	Percent
Pleomorphic adenoma	150	47.60
Monomorphic adenoma	019	06.00
Adenolymphoma	014	04.50
Oncocytoma	001	00.31
Haemangioma	008	02.52
Adenoid cystic carcinoma	042	13.30
Mucoepidermoid carcinoma	026	08.26
Carcinoma in Pleomorphic adenoma	015	04.80
Epidermoid carcinoma	017	05.40
Adenocarcinoma	012	03.81
Acinic cell carcinoma	006	01.90
Undifferentiated carcinoma	005	01.60
Total	315	100.00

In the benign group the largest number was Pleomorphic adenoma (47.60%) and in the malignant, the Adenoid cystic carcinoma (13.30%) was the largest.

Location wise parotid tumours were 243 accounting for 77 percent of the total, submandibular 28(9%) 2 cases in sublingual gland and 42 cases in minor salivary glands (14%). Preponderance of malignancy was more in minor salivary glands:24 out of 42, making 51% of the total. However, in parotid and submandibular the malignant tumours were 85 out of 243 (30%) and 9 out of 28 cases (32%) respectively. Right sided tumours were slightly more (54.6%) than left sided (45.4%).

A large number of cases (58) of benign tumours was found in the third decade followed by 54 cases in the fourth decade. Malignancy was maximum in the fifth decade. Average age for benign case was 35.5 years while for malignancy it was 47.5 years.

Females had slight preponderance of 54.3 percent in benign conditions while males were slightly more in malignant cases (52.8%). Haemangioma occurred in the smaller age group (average age 24 years). Mucoepidermoid carcinoma also occurred relatively in the younger age groups (average age 28.5 years). For the rest of the tumours average age varied from 35.5 to 44 years.

Majority, 264 (84%) cases presented as swellings of common clinical type; 51 cases presented rather differently and the clinical presentation and diagnosis were varied, 28 cases were diagnosed clinically with lymph gland involvement, 21 cases were diagnosed as lymph adenitis and 2 cases as secondaries till histology confirmed the nature of the pathology, 4 cases presented as abscess, 2 fistula, 2 diagnosed as nasal polyp and 2 as ulcer tongue/palate. 8 patients were diagnosed as cysts-dermoid/sebaceous over different areas, 4 presented as carcinoma of maxillary antrum and 1 as carcinoma cheek.

Duration of the tumours varied for benign and malignant, minimum duration for benign tumours was 1 1/2 years while for malignant cases duration was less (1 year). Maximum duration for benign was 8 years and for malignant 2 1/2 years.

Clinico pathological details of different varieties of tumours are vast to incorporate in a short paper.

However a short picture of the common types will be quite appropriate. Of the benign growths, adenomas form a large majority. Pleomorphic adenomas were 150 and monomorphic adenomas were 19, together constituting 169 out of 315 making 54%. Histological features of mixed tumours exhibit extremely diverse structural pattern (Fig. 1). Table 2 shows various histological pattern.

TABLE 2
Histological pattern of mixed tumours*

Histological pattern	Intensity of occurrence			Total	Percentage
	+	++	+++		
Myoepithelial	40	50	30	120	80.0
Myxomatous	14	20	30	064	42.3
Pseudo cartilage	20	48	22	090	60.0
Chondroid	03	05	01	009	06.0
Osteoid	-	-	-	-	-
Stromal hyalinization	06	07	02	015	10.0
Adenoid cystic	08	08	07	023	15.0
Adenomatous	02	04	02	008	05.0
Fat deposition	12	14	07	033	22.0
Squamous metaplasia	16	20	09	045	30.0

*In order to assess the relative frequency of various structural patterns; each histological pattern present in the tumour was graded arbitrarily from + to +++, one plus indicating presence, two plus indicating conspicuous presence while three plus indicating prominence.

In no case osteoid tissue was seen.

In the malignant group, common varieties were adenoid cystic carcinoma (42 cases;13.30%), mucoepidermoid carcinoma (26 cases; 8.26%) (Fig. 2). Carcinoma in pleomorphic adenoma (15 cases; 4.80%) (Fig. 3) and epidermoid carcinoma (17 cases;5.40%). A few words about the tumours of minor salivary glands would be appropriate since in the present study there were 42 cases making 13.33 percent of the total sample. 24 of the cases (57.2%) turned out to be malignant. This was statistically significant. Commonest site of occurrence was cheek and commonest carcinoma was Adenoid Cystic variety. Details of site of occur-

TABLE 3

Site of occurrence - minor salivary gland tumours

Type of tumour	Palate	Cheek	Tongue	Floor of Mouth	Lip	Nose	Max antrum	Tonsils	Larynx	Alveolar margin
Pleomorphic adenoma	3	7	2	-	1	-	-	3	2	-
Adenoid cystic carcinoma	4	6	1	-	-	1	3	-	-	1
Mucoepidermoid carcinoma	-	1	-	1	-	-	1	-	-	-
Acinic cell tumour	-	-	-	-	-	-	-	-	-	1
Adenocarcinoma	-	1	-	-	-	1	-	-	-	-
Epidermoid CA	-	1	-	-	-	-	-	-	-	-
CA in pleomorphic adenoma	-	-	-	-	-	-	-	1	-	-

TABLE 4

Histological varieties of salivary tumours in various series (in percent)

Type of tumour	Sirsat (1953)	Davies (1964)	Singh (1968)	Banerjee (1973)	Khazanchi (1988)	Panda et al (1969)	Agarwal et al (1967)	Bhargawa, et al (1982)	Present 1992
Pleomorphic adenomas	56.20	62.00	58.50	64.00	56.50	61.20	66.00	52.00	47.60
Monomorphic adenoma	-	-	1.06	4.00	-	-	-	2.30	6.03
Adenolymphoma	2.40	-	-	2.00	7.80	-	-	1.30	4.40
Oncocytoma	-	-	-	4.00	-	1.20	-	1.30	0.30
Haemangioma	-	-	-	-	-	-	-	3.00	2.40
Acinic cell CA	-	-	-	2.00	3.00	1.20	-	1.30	1.80
Mucoepidermoid CA	10.70	21.70	9.00	5.00	11.30	10.60	9.50	3.00	8.20
Adenocarcinoma	-	14.70	15.90	-	3.40	2.30	7.50	12.60	3.60
Adenoidcystic CA	12.40	-	2.12	6.00	5.60	10.60	7.50	14.00	13.30
CA in pleomorphic adenoma	-	1.60	9.00	4.00	5.60	3.50	6.00	1.30	4.60
Undifferentiated CA	-	-	11.10	-	3.40	3.60	3.40	5.80	1.30
Squamous cell CA	-	14.70	3.90	-	3.40	4.70	3.50	4.00	6.10
Carcinomas	19.00	-	-	7.00	-	-	-	-	-

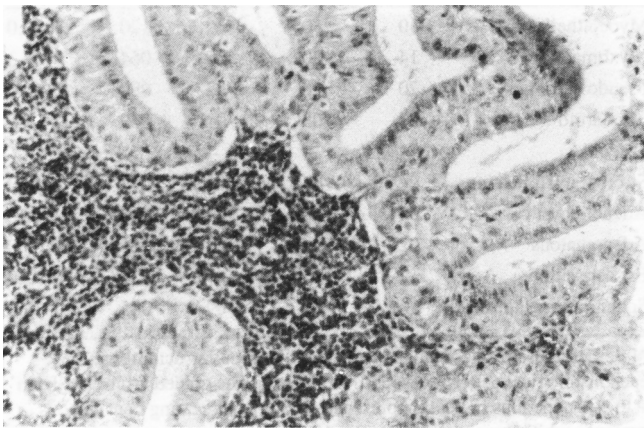


Fig. 1: Warthin's tumour showing classical lymphoid tissue surrounding which are epithelial and myoepithelial cells of salivary gland

rence are given in Table 3.

Discussion

Though salivary gland tumours have always interested pathologists, their overall incidence vis a vis total tumour occurrence is rather small. A survey of the incidence in different countries indicates more or less

similar pattern, though in one work [1] it is more than others.

Strictly speaking the incidence recorded is only of those tackled by one centre of pathology and not necessarily the occurrence in the population at large; however the figures certainly give an idea of their frequency of occurrence.

Regarding occurrence of different types of histological patterns, there are variations, as expected; However preponderance of some types viz. pleomorphic adenoma, mucoepidermoid carcinoma and adenoid cystic carcinoma is universal. One of the reasons of variation is authors outlook at classification. Present work was based on WHO system, which is authentic and agreed upon by most centres. Table 4 gives an overview of the different types of salivary tumours in different works. [18,19,20,21].

Since there were 42 cases of tumours of minor salivary glands in the present series, a comparison of the sites involved with other significant works will be quite appropriate, for which Table 5 is given [21].

TABLE 5
Comparison of site involvement in minor salivary glands

Author	Year	Alveolar Margin	Palate	Cheek	Tongue	Floor of mouth	Lip	Nose	Max antrum	Tonsils	Larynx
Bhargava and Sant (Total cases 85)	(1982)	-	19	6	15	4	4	6	23	3	5
Present series (Total cases 42)	(1992)	2	7	16	3	1	1	2	4	4	2

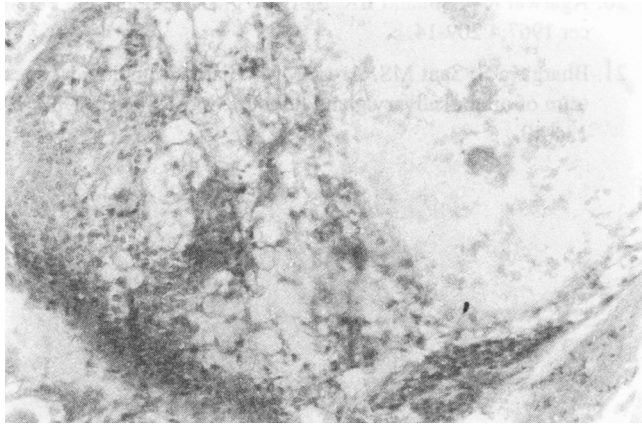


Fig. 2 : Mucoepidermoid carcinoma of parotid gland showing epidermoid and mucoid elements

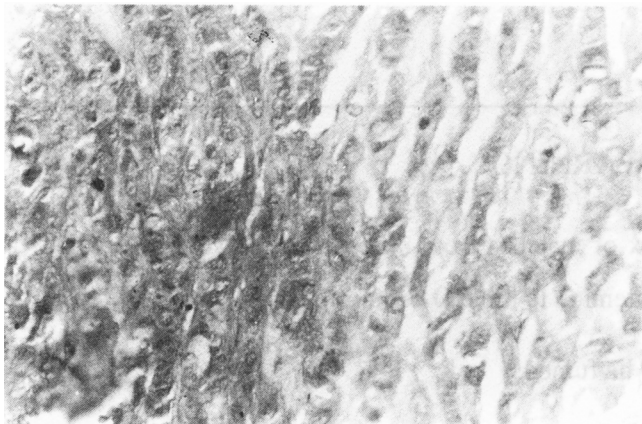


Fig. 3 : Carcinoma in pleomorphic adenoma. Note the abrupt change to hyperchromatic nuclei with mitotic figures

Comparison of age of occurrence of salivary gland tumours between present work and earlier series does not show gross difference. In benign cases the age of occurrence was slightly lower.

Regarding sex incidence, present work figures are comparable with western authors where females had slight preponderance (54.38%) over males for benign growth, while males were slightly more (52.8%) in malignant series.

Present series of 315 cases studied over a period of 23 years is one of the largest work on the subject and possibly the latest incorporating the WHO classifica-

tion. A look at the different Indian workers will be justified. (Table-6).

TABLE 6
Comparison of other Indian works

Authors	Year	Total sample
Sirsat	1953	121
Deshpandey	1955	109
Agrawal	1967	147
Panda	1969	085
Budhreja	1974	056
Banerjee	1974	111
Sinha	1975	154
Bhargava	1982	300
Khazanachi	1988	088
Present	1992	315

Salivary gland tumour is a subject of considerable interest because of its not very uncommon occurrence, varied histology and its characteristic clinical features. Present work is possibly the largest collection published so far in India and hence will be a useful addition to the present knowledge on the subject. Unlike different norms of classification adopted by earlier workers, in this series the tumours have been classified on the lines recommended by WHO (1972).

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