ORIGINAL RESEARCH ARTICLE

Evaluation of Salivary Gland Tumors Diagnosed Using CT

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A B S T R A C T

Introduction: Tumours of salivary glands are heterogenous in nature and represent with complex clinical and pathological features. When malignant tumours are concerned, the mucoepidermoid carcinoma, the cystic adenoid carcinoma are very amongst the commonly found cases. The present study was aimed to establish the different salivary gland pathologies diagnosed on radiological and histological basis.

Material and methods: The present study was conducted in the Department of Radiology during a period of 1 year. The study was conducted from August 2016 to September 2017. Patients elaborate history was obtained and all the patients underwent CT to confirm the radiological extent of salivary gland neoplasm. Biopsy of the sample was done to confirm the histopathological diagnosis. All the data obtained was arranged in a tabulated form and analysed using SPSS software.

Results: There were 24 malignant tumours of parotid gland, 4 in submandibular and 16 in minor salivary gland. Acinar cell carcinoma accounted for 50% of submandibular tumours. There were 37 benign tumours of parotid gland, 16 in submandibular and 12 in minor salivary gland. 1 benign tumour was seen in sublingual salivary gland. Pleomorphic adenoma accounted for 86.5% of benign parotid tumours. In case of malignant tumours they were clear in 23 and poor in 21 cases. The contour was smooth in 38 benign and 18 malignant tumours. The contour was irregular in 1 benign and 12 malignant tumours.

Conclusion: Salivary gland neoplasms are not commonly seen. Pleomorphic adenoma and mucoepidermoid carcinoma are the most commonly seen tumours of salivary gland. CT scan is useful in diagnosing tumours of salivary glands but it is difficult to differentiate malignant from benign tumours based of only on CT scan findings.

Key Words: Neoplasms, Mucoepidermoid, Pleomorphic

INTRODUCTION

In the head and neck region, salivary gland tumours correspond to approximately 3% of the lesions on this site and majority of them are of epithelial origin[1,2]. They have varied presentations with varied etiology and various risk factors have been involved, although lack of information on the risk factors in medical records and there is minimum importance given to tumorigenesis of salivary gland.[3] Tumours of salivary glands are heterogenous in nature and represent with complex clinical and pathological features.[4] As per the WHO (World Health organisation) the first histological classification of salivary gland neoplasms was given in 1972.[5] With better understanding of behaviour and etiology of tumours the last edition of its classification was given in 2005 by WHO.[6] The most frequently seen tumours are benign corresponding to 54-79% of the lesions and the malignant tumours account for 21-46% of the lesions.[3,7,8] The most commonly seen salivary gland tumour that accounts for 50% of the all neoplasms occurring in the salivary gland is pleomorphic adenoma and the second most common tumour is Warthin's tumour which is seen in 4-14% cases. When malignant tumours are concerned, the mucoepidermoid carcinoma, the cystic adenoid carcinoma are very amongst the commonly found cases.[9,10] The glands most frequently affected are the parotid gland and submandibular glands respectively. The minor salivary glands are generally affected by malignant tumours and nearly every tumour originating from the sublingual gland is malignant in nature.[3] The present study was aimed to establish the different salivary gland pathology diagnosed on radiological and histological basis.

MATERIAL AND METHODS

The present study was conducted in the Department of Radiology during a period of 1 year. The study was conducted from August 2016 to September 2017. Ethical committee clearance was obtained from the Institute's ethical board and all the subjects were informed about the study. The subjects were made to consent in their vernacular language before initiation of the study. Subjects belonging to ASA grade III or IV were excluded from the study and all the subjects unwilling to consent were also excluded. Patients elaborate history was obtained and all the patients underwent CT to confirm the radiological extent of salivary gland neoplasm. Demographic details of all the subjects like age, gender and race were obtained and filled in a predesigned proforma. Biopsy of the sample was done to confirm the histopathological diagnosis. All the data obtained was arranged in a tabulated form and analysed using SPSS software. The results were expressed as percentage.

Histology	Parotid (n/%)	Submandibular (N/%)	Sublingual (N/%)	Minor (N/%)	Total (N/%)
Adenoid cystic carcinoma	1(4.2%)	1(25%)	0	5(31.2%)	7(15.9%)
Acinar cell carcinoma	5(20.8%)	2(50%)	0	3(18.7%)	10(22.7%)
Mucoepidermoid carcinoma	5(20.8%)	0	0	4(25%)	9(20.5%)
Adenocarcinoma	2(8.3%)	1(25%)	0	3(18.7%)	6(13.6%)
Squamous cell carcinoma	3(12.5%)	0	0	0	3(6.8%)
Pleomorphic adenocarcinoma	8(33.3%)	0	0	1(6.2%)	9(20.5%
Total	24(100%)	4 (100%)	0	16 (100%)	44(100%)

Table-1: Distribution of malignant tumors according to histology and site

Histology	Parotid (n/%)	Submandibular (N/%)	Sublingual (N/%)	Minor (N/%)	Total (N/%)
Pleomorphic adenoma	32(86.5%)	15(93.8%)	1(100%)	11(91.7%)	59(89.4%)
Warthin's tumor	5(13.5%)	1(6.2%)	0	0	6(9.1%)
Canalicular adenoma	0	0	0	1	1(1.5%)
Total	37 (100%)	16(100%)	1(100%)	12(100%)	66(100%)

Table-2: Distribution of benign tumors according to histology and site

Features	Variation	Benign (n=66)	Malignant (n=44)	P value
Contour	Smooth	38	18	<0.05
	Lobulated	27	14	
	Irregular	1	12	
Margin	Clear	45	23	<0.05
	Poor	21	21	
Cystic change	Present	10	9	0.07
	Absent	56	35	0.09
Calcification	Present	3	22	
	Absent	63	22	
Necrosis	Present	16	5	0.30
	Absent	47	39	

Table-3: Imaging features of benign and malignant tumours

RESULTS

In the present study a total of 110 cases were analysed. Majority of subjects were females. The mean age of the subjects was 35.78 +/-4.87 years.

Table 1 illustrates the distribution of malignant tumours. There were 24 malignant tumours of parotid gland, 4 in submandibular and 16 in minor salivary gland. No malignant tumor was seen in sublingual salivary gland. Pleomorphic adenocarcinoma accounted for 33.3% of malignant parotid tumours. The least common tumor was adenoid cyctic carcinoma seen in 4.2% cases. Acinar cell carcinoma accounted for 50% of submandibular tumours. Adenoid cyctic carcinoma accounted for 31.2% of tumours of minor salivary gland. The most commonly seen malignant tumour was acinar cell carcinoma followed by mucoepidermoid carcinoma and pleomorphic adenocarcinoma.

Table 2 illustrates the distribution of benign tumours. There were 37 benign tumours of parotid gland, 16 in submandibular and 12 in minor salivary gland. 1 benign tumour was seen in sublingual salivary gland. Pleomorphic adenoma accounted for 86.5% of benign parotid tumours. The least common tumor was Wharthin's tumour seen in 13.5% cases. Pleomorphic adenoma accounted for 93.8% of submandibular tumours. Pleomorphic adenoma accounted for 91.7% of tumours of minor salivary gland. The most commonly seen malignant tumour was Pleomorphic adenoma followed by Warthin's tumour.

Table 3 shows the features on CT imaging. There were 16 cases of benign tumour with necrosis and 5 cases of malignant tumours with necrosis. In 3 benign tumours and 22 malignant tumours calcification was seen on CT images. Cystic change was present in 10 benign and 9 malignant tumours. The margins were clear in 45 benign tumours and poor in 21 benign tumours. In case of malignant tumours they were clear in 23 and poor in 21 cases. The contour was smooth in 38 benign and 18 malignant tumours. The contour was irregular in 1 benign and 12 malignant tumours.

DISCUSSION

Various studies have been done to demonstrate the epidemiology of benign and malignant salivary gland neoplasms.[4,11,12] The presence of myoepithelial cells in the salivary glands is responsible for the different histological varieties of neoplasias.3 Studies reported in literature, have shown that majority of neoplasms whether benign or malignant in nature are seen in parotid gland. Palate is the most commonly affected site in case of minor salivary gland. Females are more frequently affected by salivary gland neoplasms. Benign tumours are commonly seen in third decade of life whereas malignant are seen during sixth decade. Mesenchimal tumours contribute for almost 1.9% to 5% of all the salivary gland neoplasms. According to Takahama *et al*. in a case series of 600 cases there were 95% of the tumours that were of epithelial origin, while the rest 5% were not of epithelial origin.[13] In our study, there were 24 malignant tumours of parotid gland, 4 in submandibular and 16 in minor salivary gland. No malignant tumor was seen in sublingual salivary gland. Pleomorphic adenocarcinoma accounted for 33.3% of malignant parotid tumours. The least common tumor was adenoid cyctic carcinoma seen in 4.2% cases. Acinar cell carcinoma accounted for 50% of submandibular tumours. Adenoid cyctic carcinoma accounted for 31.2% of tumours of minor salivary gland. The most commonly seen malignant tumour was acinar cell carcinoma followed by mucoepidermois carcinoma and

pleomorphic adenocarcinoma. These results of the study were similar to the study conducted by Kayembe et al[14], although according to some studies, the mucoepidermoid carcinoma was the most common malignant neoplasia.[15] According to a study conducted by Tian *et al*. [11] and Li *et al*.[16] the major salivary gland especially parotid are the site for salivary gland neoplasms. In the present study, there were 37 benign tumours of parotid gland, 16 in submandibular and 12 in minor salivary gland. 1 benign tumour was seen in sublingual salivary gland. Pleomorphic adenoma accounted for 86.5% of benign parotid tumours. The least common tumour was Wharthin's tumour seen in 13.5% cases. Pleomorphic adenoma accounted for 93.8% of submandibular tumours. Pleomorphic adenoma accounted for 91.7% of tumours of minor salivary gland. The most commonly seen malignant tumour was Pleomorphic adenoma followed by Warthin's tumour. Some of the studies have shown that the mucoepidermoid carcinoma was the most frequent malignant tumour and whereas according to others the adenoid cystic carcinoma was the most commonly seen. These differences may have been due to variation in region, gender and race. As per the study conducted by Kin et al, 7% of the cases that were histologically classified as malignant were benign according to CT findings.[17]

CONCLUSION

Salivary gland neoplasms are not commonly seen. Pleomorphic adenoma and mucoepidermoid carcinoma are the most commonly seen tumours of salivary gland. Parotid gland is the most frequently affected site for neoplasms. Malignant tumours were most common in minor glands than benign tumours. CT scan is useful in diagnosing tumours of salivary glands but it is difficult to differentiate the malignant from benign tumours based only on CT scan findings.

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