

Clinicopathological study of salivary gland neoplasm

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Abstract

An observational study was done in 60 cases of benign and malignant salivary gland. Patients were collected from ENT Department of Dhaka Medical College Hospital, Dhaka during the period of September 2003 to August 2004. Here patients belonged to different age group range from 21 to 80 years. Parotid gland was involved in 50 cases and submandibular gland in 10 cases. In case of parotid gland 35 cases found benign and 15 cases were malignant. In submandibular gland benign and malignant cases were equal.

Histopathological study showed, 60% were pleomorphic adenoma and 10% were Warthin's tumour in case of parotid gland. In malignant cases mucoepidermoid cases, adenoid cystic carcinoma were equal 10%.

Common presenting feature was swelling, that is 100% followed by pain 26.66% and skin involvement in 8.3%. Duration of symptoms varies from 2 month to 12 years. In parotid tumours, superficial lobe was affected in 97.14%.

All of the patients were treated surgically. In case of benign parotid tumour. Superficial parotidectomy was done in 97.14%. Total conservative parotidectomy was done in 2.85%.

In case of malignant tumour, total conservative parotidectomy was done in 33.34% case, radical energy needed in 46.66%.

Key word : Salivary gland neoplasm

Introduction

Salivary gland tumours represent about 3% of all neoplasms and constitute about 10% of all head and neck tumours. Although tumours of the salivary glands are not uncommon in this country but the actual aetiological factor has yet not established. Although the disease is not less common in our country in comparison with western countries yet negligible number of studies have been carried out in our country in the past. So the exact incidence of the disease in this country have not been evaluated.

Aims and Objectives

1. To find out the incidence of salivary gland neoplasms
2. To see the pattern of salivary gland neoplasms
3. Management planning.

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Methods

A total 60 cases of salivary gland tumours both benign and malignant were studied. All patients were collected from the ENT and surgical units of Dhaka Medical College Hospital, Dhaka, during the period of September 2003 to August 2004.

The patients were interrogated thoroughly about their occupation, exposure to irradiation especially in the neck region if any, any previous operation done to remove the tumour, habit of smoking, alcohol intake. After thorough and detailed history taking and clinical examination laboratory investigation were carried out in all the cases and diagnosis was confirmed by histopathological examination after operation.

Routine blood examination, fasting blood sugar, blood urea, urine examination, X-ray of the skull and chest X-ray, X-submandibular region FNAC was done routinely. Per-operative frozen section biopsy was done in suspected salivary malignancy.

Histopathological studies were carried out in the pathological laboratories of Dhaka Medical College Hospital and outside. Diagnostic criteria followed in the present series are the followings:

1. Painless swelling for many months/years in benign tumour.
2. Slowly growing mass in the benign tumour.
3. Movable lump occupying a particular region of the gland not involving the whole gland in parotid neoplasm.
4. Recent onset of pain with rapidly growing tumours in a previously slow growing tumour is diagnostic of malignancy.
5. Rapidly growing tumour, with facial nerve palsy - in malignant parotid tumour.
6. FNAC +ve, Frozen section followed.
7. Histopathological confirmation.

Results

The present series of 60 cases include the varieties of salivary gland tumours both benign and malignant.

Table - I

Location of different salivary gland Tumours:

Tumours	No. of cases	Percentage
Parotid gland	50	83.33%
Suhmandibular gland	10	16.66%
Sublingual gland	0	0

Table - II

Incidence of benign and malignant tumours (n-60)

	Parotid gland		Submandibular gland	
	Benign	Malignant	Benign	Malignant
	35	15	5	5
	70%	30%	50%	50%

Table - III

Incidence of different types of parotid tumour (Histopathological Diagnosis)

Benign Tumours	Parotid gland (%)
Pleomorphic Adenoma	30 (0%)
Warthin s Tumours (Adenolymphoma)	5 (10%)
Total	35
Malignant Tumours	
Mucoepidermoid carcinoma	5 (10%)
Adenoid cystic carcinoma	5 (10%)
Adenocarcinoma	3 (6%)
Carcinoma in pleomorphic adenoma	2 (4%)
Total	15

Table-IV

Age Distribution

Age in years	No. of case	Percentage (%)
21 - 30 yrs.	4	6.66%
31 - 40 yrs.	4	6.66%
41 - 50 yrs.	27	45.02%
51 - 60 yrs.	16	26.66%
61 - 70 yrs.	8	13.33%
71 - 80 yrs.	1	1.66%
Total	60	100

Table-V

Common Clinical Presentation of Patients

	No. of cases	Parotid		Submandibular		Total
		Benign	%	Benign	%	
1. Swelling	60	35	58.33	15	25	100%
2. Pain	18			9	15	26.66
3. Facial nerve paralysis	4			4	6.66	6.00
4. Skin involvement	1			2	3.33	8.33
5. Trismus	1			2	3.33	3.33
6. Metastasis lung	2			2	3.33	3.33
7. Palpable lymph node	5			2	3.33	11.66
8. Swelling in parotid tail	4	4	6.66			6.66

Table-VI
Duration of Symptoms Before Admission In Hospital

Duration of symptoms	Pleomorphic Adenoma		Warthin's tumour		Carcinoma pleomorphic adenoma		Mucoepi-dermoid carcinoma		Adenoid cystic Carcinoma		Anaplastic carcinoma		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
	2 month- 1 yrs	2	5.5											2
1 - 2 yrs.	16	44.40							7	33.33	2	100	20	33.33
2-4 yrs.	4	11.11	6	100			4	66.67	4	66.67			18	30.00
4-8 yrs	12	33.33					2	33.33					14	23.33
8- 12 yrs.	2	5.5			4	100							6	10.00

Table- XIII
H1stological Grading of Malignant Salivary Gland Tumours (n=9)

	Parotid	Percentage	Submandibular	Percentage
Grade - I	-	-	-	-
Grade - II	8	53.33%	1	50%
Grade III	5	33.33%	1	50%,
Grade- IV	2	13.34%	-	-
Total	15	100%	2	100%,

Table-VIII
Treatment

Nature of Treatment modalities	Parotid gland No. of cases	Submandibuiar gland No. of cases
Benign Tumour		
Superficial parotidectomy preservation of facial nerve.	34(97.14%)	
Total conservative parotidectomy	1 (2.85%)	-
Submandibuiar gland resection	-	8(100%,)
Total	35(100%)	8 (100%,)
Malignant Tumour		
Total conservative parotidectomy	5 (33.34%,)	-
Radical Surgery	7 (46.66%,)	-
Radical parotidectomy + excision of local skin + repaired by deltopectoral flap.	3 (20%)	
Suhmandibular gland resection with neck dissection		1 (50%)
Submandibuiar gland resection	-	1 (50%)

Table-IX
Complications Following Treatment

Modalities of treatment	Nature of complications		Parotid %	Subman -dibular
	Parotid	Subman-dibular		
Benign tumour:				
Superficial parotidectomy	Facial weakness-3		16.16%	
	Haematoma- 2		11.11%	
Total conservative Parotidectomy	Infection- 1 Frey's syndrome- 1		5.56%	
	Facial paresis- 1		5.56%	
Submandibular gland resection	Paresis of the marginal mandibular nerve			1(20%)
Malignant tumour :				
Radical surgery	Facial paralysis - 2		33.33%	
	Haematoma - 1		16.67%	
Surgery + radiotherapy	Facial paresis - 1		16.67%	
	Skin burn, Ulceration -3		50%	
Radiotherapy	Skin burn necrosis ulceration-1		16.67%	
Submandibular gland resection + radiotherapy		Skin burn, Necrosis- 2		66.67%

Table-X
Follow up of Patients

Nature of operation	Total No. of Treated	No. of Patients followed up	Follow-up periods
Benign Tumours			
Superficial parotidectomy.	30	4(13.33%)	One year
Total conservative	5	1 (20%)	One year
Total excision of submandibular gland.	8	1 (12.50%)	One year
Malignant Tumours			
Total excision of parotid gland. Surgery of Radiotherapy	1	1 (100%)	One year
1. Parotid	8	2 (25%)	6 mon & 1 reported death
2. Submandibular	7	2 (28.57%)	
Radiotherapy alone			
1. Parotid	1	1 (100%)	6 months
2. Submandibular			reported death

Discussion

In this present series 60 cases of salivary gland neoplasms were analyzed with their incidence rate, clinical presentations and management which have been compared to those in other reports from the home and abroad. This relatively small series comprising of benign and malignant neoplasms of parotid and submandibular salivary glands. Diagnosis of all tumours were confirmed by histopathological examinations. The results obtained in this series are compared with other studies.

The patients were from different regions of the country. Out of 60 cases, 50 neoplasm were in parotid gland and 10 were in the submandibular gland. Aetiological factor is very difficult to ascertain but the comments of Scheneider et al (1998)¹ who showed an association between radiation exposure with salivary gland neoplasm is not applicable in my study, where none of the patients were received any previous radiation. Reports shows smoking, alcohol consumption is unrelated to salivary gland cancer² is not also justified in this study. In this study also no aetiological factors could be clearly detected. 87.50 of the male patients were smoker and no patients give the history of previous irradiation to neck, which might have a role in developing malignancy in salivary gland.

In this series out of 60 cases there are 50(83.33%) of parotid neoplasm and 10(16.66%) case of submandibular neoplasm. Among the parotid neoplasms 35(70%) benign and 15(30%) malignant neoplasms. Among submandibular neoplasm 5(50%) were malignant and 5(50%) were benign neoplasms. This results conforms with other studies.^{3,4,5} Incidence of benign parotid tumour in present series shows pleomorphic adenoma in 30 cases (60%) which corresponds with the higher incidence in the different western series⁶ and Warthin's tumour 5(10%). In case of benign submandibular salivary neoplasms among which pleomorphic adenoma is 6(60%) in this series compared to 48.2% in Evans and Cruickshank and a warthin 1(20%). Regarding malignant salivary neoplasms, parotid neoplasms 15(30%) and submandibular gland malignancy 8(80%). Incidence of malignancy is higher in submandibular gland which conforms with other studies.^{3,4,5} Among the parotid malignancy mucoepidermoid carcinoma 5(10%), adenoid cystic carcinoma 5(10%) and adenocarcinoma 3(6%), carcinoma in pleomorphic adenoma 2(4%).

Neoplasms of salivary gland may occur at any age. Malignant tumours usually appear in later age group but may be seen in the adolescents. In this study highest numbers of patients were in the 4th & 5th decade (68.75%), which correlate with other studies^{6,7,8}.

In the present series all the cases presented with a swelling. Size of the swelling in most pleomorphic adenoma more than 2 cm and the malignant tumour varied between 2 to 4 cm. The longer the duration larger the swelling. One tumour originate from the deep lobe of the parotid presented with a swelling of lateral pharyngeal wall. Patient reported with signs of malignancy are pain 18(26.66%), facial nerve paralysis 4(6.66%), Fixation to a skin 4(8.33%), trismus 2(3.33%) Lymph node metastasis; 5(8.33%) and distal metastasis 2(3.33%).

18 patients presented with pain in the tumour region-with radiation to the ear and head. In this series pain in the malignant tumour was present in all cases, in one case it was intractable due to involvement of the base of the skull and perineural sheath and this was inoperable case.

According to Thaekey "pain is relatively infrequent in malignant mixed tumour, adenoid cystic carcinoma, but in squamous cell carcinoma pain is observed in 3/4th of the patients." There may be intractable pain due to involvement of the base of the skull and there may be associated paralysis of the cranial nerves.⁹ Generally facial nerve paralysis occurs in only 1/3rd of all cases of malignant parotid tumours. No benign tumour had facial nerve involvement. Malignancy may involve the trunk or any branch of facial nerve. In case of malignant submandibular gland tumour the lingual and hypoglossal nerves may be involved. According to line-roth work involvement of the facial nerve in the malignant parotid tumour is 40%.¹⁰ In western reports it has been found that facial nerve paralysis may occur even in the benign pleomorphic adenoma and warthin's tumour of the parotid gland.

Tumours of the parotid gland do not involve whole of the gland. In the present series both benign and malignant tumour appear in front and behind of the ear lobule. In both benign and malignant tumours of the submandibular gland, the whole gland was involved clinically. In one patient, anaplastic carcinoma involved the whole of the left side of the face and neck with facial nerve paralysis and another patient had wide

local invasion of parotid tumour with involvement of the temporomandibular joint. Fraccl showed that 62.7% of the parotid tumours appeared in front of the ear lobule¹¹, and according to John H. Woods 32.7% tumours appeared in that region.¹² It seems that most of the tumours used to appear in front of the ear lobule but the cause for preference of this region is not known.¹²

Regarding investigation in my series FNAC was done in all 60 cases (100%), of which 49 cases (81.66%) was positive which is also related with the study of Lindberg and Ackerman¹³, 4 cases (6.67%) was false negative, 7 cases (11.67%) was doubtful/unsatisfactory results. Sialography was done in 4 cases in suspecting sialolithiasis. Later on found pleomorphic adenoma. All cases were confirmed post operatively by histopathological examination.

Medical imaging, gives useful information about topography of the tumour and helps in planning the treatment. Plain X-rays of soft tissue may be helpful in identifying masses in the parotid area which do not arise in the parotid gland such as cystic lesions of the mandible¹⁴ but are otherwise not of much help. Sialography has no place in parotid tumour except in cases of inflammatory conditions of the parotid gland. Rather, it is thought that the high pressure generated during sialography may disseminate tumour cells.¹⁵ Ultrasound has little place in modern treatment, again except in inflammatory conditions. It is non-invasive, harmless, painless, quick and low cost. It distinguishes between solid and cystic lesions. It may be useful for vascular tumours in children, in detection of ectopic tumours and in the follow-up for early diagnosis of recurrence. A CT scan demonstrates the parenchyma of the gland quantitatively and is routinely used by some clinicians. The absorption of X-rays demonstrates the pattern of the tumour and is 100 percent accurate in cases of lipoma¹⁶. It obviously determines the extent of the larger lesions and helps in planning the treatment. It is particularly important in evaluation of those tumours in inaccessible areas such as retromandibular fossa, parapharyngeal space pushing the palate or tonsils and base of the skull bone. It also distinguishes between deep lobe tumours in this area from extraparotid lesions like glomus vagale or minor salivary tumours etc. Recently, MRI has been found to be superior to CT particularly under the following circumstances :

1. To determine the exact site and extent of the lesion;
2. In cases of deep lobe tumour;
3. In suspicion of malignancy;
4. In cases of recurrent tumour;
5. In parotid swelling with reduced mobility.

Current reports suggest that a good quality T2 weighted image can delineate the position of the facial nerve with respect to the tumour.¹⁷ Here in this series only 9 patients had a CT scan which only confirmed the clinical picture, and determined the extent in cases of malignant tumours.

Scinti-scanning (technetium scintigraphy) is of limited value in some differential diagnostic problems. It will show the hot nodule of an adenolymphoma and oxyphil adenoma but nothing else.^{17,18}

Fine needle aspiration cytology, the decision on treatment of a salivary gland neoplasm depends upon a correct diagnosis. Specimens from the lesion and close communication between surgeon and histopathologist is critical in establishing the histopathological diagnosis. In some cases consultation with more than one pathologist may be necessary. In FNAC the exact site of the biopsy must be ascertained to determine whether the lesion is within or outside the parotid gland. However, it is easy to perform FNAC in the parotid region with minimum complication. The salivary glands are most accessible and optimal sites for aspiration biopsy. Great enthusiasm was shown by Stewart and Von Haam when they examined the aspirates from mixed salivary gland tumours.^{19,20} Enerolh et al. reported 1000 cases with a high degree of reliability." Amongst tumours pleomorphic adenoma was found to be most reliable because of the characteristic group of epithelial cells within a myxomatous substance." The accuracy ranges from 77 percent-95 percent found in other literature^{21,22,23}. However, more recently Roland reported 90.9 percent of FNAC correctly diagnosed as malignant in presence of malignancy and 100 percent of FNAC correctly diagnosed as benign in the absence of malignancy. Inaccurate results are mostly due either to an improper biopsy technique or an inexperienced examiner. The complication of seeding through the needle tract in malignant lesions has not been reported. Therefore, it is felt that FNAC is a very useful tool for pre-operative diagnosis and treatment planning provided a well experienced

cytologist is present in the centre.

After assessment of the tumour whether it was benign or malignant the patients were treated accordingly. Almost all the benign tumours of the parotid gland (30 out of 35 cases) were pleomorphic adenoma 30(85.70%) cases were treated by superficial parotidectomy, 5(14.30%) by total conservative parotidectomy. Of the 8 benign tumours of submandibular gland 6 (75%) were pleomorphic adenoma and 2(40%) was Warthin's tumour and were treated by total excision of the gland without any complications. Of the malignant tumours (parotid & submandibular), 15 patients were treated by surgery and radiotherapy, and 5 patients were treated by radical surgery and rest 3 patient was treated only by Radiotherapy.

The facial nerve must always be preserved during parotid surgery. "A nerve exposed is a nerve damaged", a theme of general surgery is a verse of the past and does not exist any more particularly in relation to parotid surgery. The facial nerve bisects the parotid gland and the branches run anteriorly through the gland substances separating it into superficial and deep lobe. Snow mentioned that pleomorphic adenoma is more frequent in superficial lobe.¹⁸

Malignancy in the parotid gland is less common than benign tumours but it always presents a challenge of diagnostic and therapeutic management because of the questionable local control by post operative radiotherapy and secondly the problem of metastasis²⁴. 'The more common malignant tumours of the parotid gland are adenocarcinoma, adenocystic carcinoma, mucoepidermoid tumour and malignancy arising in pleomorphic adenoma. Radical surgery is the best form of treatment with preservation of the facial nerve where possible and followed by post operative radiation.²⁵

Elective neck dissection in parotid malignancies has not yet received popularity because the indications are not clearly defined.²⁶

In the present series follow up could hardly be made for 1-1.3 years. None of the pleomorphic adenoma showed any recurrence. The Warthin's tumour were followed up between 6 month to 1 year and none showed any recurrence. Out of 15 patients with malignant tumours (both parotid and submandibular gland) treated by surgery and, or radiotherapy, only 3 achieved local control of tumour. These patients felt

better, relieved of pain and the tumour did not grow further during the follow up period. Other 12 patients got minimum benefit from surgery or radiotherapy and there was recurrence within 6 months, which conforms with other western series. Bcahrs reported post operatively local recurrence rate of 37. %6 for moderately malignant and 72.5% for highly malignant tumours of the parotid gland.²⁷ Spiro observed local recurrence rates of 7 for Stage-I, 21% for Stage-II, 58% for the Stage-III and 75% for Stage-I V and 27% for all stage of cancer of the parotid glands.²⁸

Radiotherapy was not given in all cases suggesting that the tumours were least radio-sensitivity. But in a series of 120 cases of malignant parotid tumour, Guillaumondegui reported local recurrence rate of 26% in patients treated with surgery alone, but only 14% in patients who received post operative radiotherapy even with known residual disease.²⁹ In the present series no patients could be followed up for 5 years as the patients included in the year 1998 and 1999. So no comment could be made in this regard. Most of the patient have not completed 1 year follow up study. It is too early and impracticable to comment on the 5 years survival at present.

In comparison to other studies incidence of post treatment complication were low in the present series. Conley states that approximately 50% of the patients have a mild temporary weakness of the facial nerve. Paralysis is rare but temporary paresis occurs in 10-20% of cases, with recovery time, varying from weeks to months.⁴

There is no substitute for detailed clinical history and examination in the assessment of salivary gland neoplasms. None of the available tests is infallible, and misleading results may be obtained. MRI has proved to be superior to CT scan as far as parotid neoplasm is concerned (Snow, 1979) FNAC is a useful tool for preoperative diagnosis provided a well experienced salivary gland cytologists examines the specimen. Accuracy in the hands of experts is very high.

Technetium '99 scanning is the best method of preoperative defining the hot nodules of an adenolymphoma and oxyphil adenoma.

The management of patients with submandibular gland diseases is a challenging one. Accurate clinical diagnosis can often, however, be obtained after a good history taking, through examination and the use of selective investigations.²⁹

Early diagnosis, adequate and proper treatment improve the prognosis. Parotidectomy is still the treatment of choice for parotid neoplasms and all most all 23 cases in this series had this performed. To prevent recurrence of benign parotid neoplasm, superficial parotidectomy is preferred to enucleation which was practiced earlier. As high grade malignant tumours are very prone to recur and local invasion, with multidisciplinary approach gives better results. In suspected cases of malignancy frozen section biopsy is a useful tool for per operative diagnosis. Four percent had Frey's syndrome and eight percent had facial paralysis. The follow up period was not very long. Recurrence was found in two of the malignant tumours. It is not possible to comment on non-recurrent rates due to the short periods of follow up time. However none of the pleomorphic adenoma showed any recurrence. This makes us comfortable with our present method of management.

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