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Original Research Article

Clinical and Epidemiological Study of Parotid Gland Tumours

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Abstract

Background: We wanted to study the age and sex distribution, various types of tumours occurring in different salivary glands, and their modes of clinical presentation. We also wanted to assess the efficacy of treatment offered to the patient and identify the complications ensuing therein, as a consequence of the intervention.

Materials and Methods: This was a prospective study of salivary gland tumours conducted among 40 cases admitted in various surgical units in M.K.C.G Medical College and Hospital, Berhampur, from July 2019 to June 2021.

Results: In this study, 11 (27.5%) patients were males and 29 (72.5%) were females. M: F ratio was 1:2.6. In benign tumours, M: F ratio was 1:2.8 and in malignant tumours it was 1:2. The incidence of benign tumours was 85% and the malignant tumour was 15%. Patients presented with a history of swelling varying from 3 months to 12 years and swelling was the most common symptom. The commonest surgery for the benign parotid tumour was superficial parotidectomy and for the malignant tumour was total parotidectomy. The commonest postoperative complication was facial nerve weakness. This was seen mainly in patients with malignant and recurrent tumours. The incidence of permanent facial nerve weakness was 5%. This is comparable to the western standard (0-17%).

Conclusion: Parotid gland tumours occur more commonly in the 3rd to 5th decade and are seen most commonly in females. Parotid gland tumours are more often benign, pleomorphic adenoma constitutes the majority of all neoplasms.

Keywords: Parotid Gland Tumours, Superficial Parotidectomy, Benign, Pleomorphic Adenoma

Introduction

Salivary glands, major and minor, comprise a complex anatomic and physiologic "organ" system-producing enzyme, lubrication, mixing agent and immune factors. They may fall prey to a host of pathologic conditions including infection, immune disorder, hypertrophy and atrophy, systemic disease and "neoplastic both benign and malignant". [1]

Salivary gland neoplasms are uncommon and constitute 2-6.5% of all head and neck neoplasms and only 0.3% of all malignancies. But still, they are very challenging to the surgeon, as there are vital structures in close relation with both the parotid and submandibular gland. [2]

Aims and Objectives

1) To study the age and sex distribution and various types of tumours occurring in different salivary glands.
2) To study their modes of clinical presentation.
3) To assess the efficacy of treatment offered to the patient.
4) To identify the complications ensuing therein, as a consequence of the intervention.

Materials and Methods

This prospective study of salivary gland tumours was carried out on 40 cases admitted to various surgical units in M.K.C.G Medical College and Hospital, Berhampur, from JULY 2019 to JUNE 2021. 40 cases of salivary gland tumours were studied and data is presented here, which were analysed and conclusion drawn. The statistics have been compared with different standard studies conducted on the same subject by various authors around the world.

Inclusion Criteria

All patients with parotid gland tumours were admitted to surgical wards in M.K.C.G Medical College and Hospital.

Exclusion Criteria

- Patients who refused surgical treatment.
- Other salivary gland tumours apart from parotid.
- Parotid gland swellings other than tumours (inflammatory and non-inflammatory origin).

Study Procedure

All patients admitted were evaluated by documenting their history, thorough clinical examination, routine laboratory investigations and specific investigations. In history, importance was given to presenting complaints, duration of lump, rapidly increased size, associated symptoms of facial nerve involvement, previous surgical treatment or any medical problem.

Regarding physical examination, particulars mentioned in the proforma were noted. Importance was given to the site, the extent of the tumour, deep lobe enlargement and fixity to the surrounding structures, nerve involvement and regional lymphadenopathy. Associated medical conditions like diabetes, hypertension and anaemia were managed and controlled before surgery with the physician's advice.

As a part of general work up for surgery in all patients, haemoglobin level, bleeding time, clotting time, urine, sugar albumin, microscopy, and chest screening, ECG, Blood urea, Serum creatinine, and RBS were estimated. Specific investigations like FNAC, an x-ray of the neck and parotid region, and USG of the neck and parotid region were done for all patients in the study group. CT scan and MRI were

done for some of these patients in the study group.

After evaluation of the tumour by clinical examination and specific investigations, a surgical plan was formulated. The final decision was taken operatively by the surgeon. The specimen was sent for HPE. Appropriate antibiotics and analgesics are administered postoperatively for all cases. A drainage tube was removed on the 3rd day and sutures on the 5th day. Malignant tumours were referred to Radiotherapy Dept, M.K.C.G. Medical College & Hospital and A.H.R.C.C Cuttack, after surgery, for postoperative radiotherapy. The adjuvant treatment was decided depending on the final HPE report.

Different modalities of treatment adopted in this study were

1. Surgery alone
2. Surgery and postoperative radiotherapy

The follow-up period of these patients was 6 months. All patients were asked to come for follow-up after 15 days of surgery and then every month for 6 months to detect morbidity and recurrence. Long-term follow-up is necessary to study the tumour recurrence, which was not possible in this study.

Results

Following observations were made in 40 patients who presented with salivary gland neoplasms in this study.

Age Incidence

Table 1: Demographic Distribution

Age in years	Benign tumours	Malignant tumours	Total Patients	Percentage
11 to 20	3	0	3	7.50%
21 to 30	10	0	10	25%
31 to 40	6	2	8	20%
41 to 50	10	0	10	25%
>50	5	4	9	22.50%
Total	34	6	40	100%
Distribution of Tumours in Different Age Group				
Sex	**Benign**	**Malignant**	**Total**	**Percentage**
Male	9	2	11	27.50%
Female	25	4	29	72.50%
Total	34	6	40	100%
Tumour Sex Cross Tabulation				

The age incidence of the patients in the study group ranged from 16-80 years. Most patients in this series were in the 3rd to 5th decade of life (70%). Benign tumours were more common in 20 to 50 years and malignant tumours were common after 50 years. The mean age was 39 years for benign tumours and 58 years for malignant tumours.

Sex Incidence

In this series, 11 (27.5%) patients were males and 29 (72.5%) were females. M: F ratio was 1:2.6. In benign tumours, M: F ratio was 1:2.8 and in malignant tumours it was 1:2.

Modes of Presentation

Table 2: Signs and Symptoms

Symptoms	**No. of patients**	**Percentage**
Swelling	40	100%
Pain	4	10%
Facial palsy	1	2.5%
Recurrent tumour	4	10%
Symptoms of Salivary Gland Tumours		
Signs	**Benign**	**Malignant**
Fixity	0	2
Deep lobe involvement	1	1
Facial nerve involvement	0	1
Nodal involvement	0	2
Metastasis	0	0
Signs of Salivary Gland Tumours		

All patients presented with swelling. Features of rapid growth, pain, and associated facial paralysis were considered signs of malignancy. Out of 40 patients, 4 patients presented with pain (10%) in swelling, out of which 2 were benign and 2 were malignant. Pain occurred in 33% of the patients with malignant tumours and 6% of the patients with benign tumours. One patient had facial nerve paralysis at presentation. 4 cases of recurrent tumours were operated on in this series, out of which, there were 3 cases of Pleomorphic adenoma and one case of Mucoepidermoid carcinoma.

Clinical Findings (SIGNS)

Features of fixity, facial paralysis and nodal involvement were considered signs of malignancy. Malignant tumours were mostly hard in consistency. Deep lobe enlargement was seen in 2 patients in this series. 2 patients presented with cervical lymph node metastasis and 2 patients, one with malignant mixed tumour and the other with MEC presented with fixity to masseter / mandible.

Surgical Procedures

Table 3: Types of Surgical Treatment and Complications

Procedure	**No. of cases**	**Percentage**
Superficial parotidectomy	30	75%
Total parotidectomy	4	10%
Radical parotidectomy	1	2.5%
Excision	5	12.5%
Types of Surgical Treatment Adopted in the Study		
Complication	**Benign tumours**	**Malignant tumours**
Facial palsy – temporary -permanent	7 0	2 2
Salivary fistula	2	0
Frey's syndrome	0	0
Recurrence	0	0
Wound infection	2	0
Complications following Surgery		

Superficial parotidectomy was performed in 30 patients (75%), conservative total parotidectomy in 4 patients (10%) and radical parotidectomy in 1 patient.

Complication of Surgery

Postoperatively, 11 patients developed facial palsy, out of which 9 were

temporary (improved over 3-6 months) and permanent facial nerve weakness was seen in 2 patients (5%), both of them had malignant parotid tumour. Wound infection was seen in 2 patients and parotid fistula in 2 patients with pleomorphic adenoma who had undergone superficial parotidectomy, which healed spontaneously within 6 weeks. No postoperative death was encountered in this study.

Efficacy of FNAC in Diagnosing Salivary Gland Tumours

There was no statistically significant difference in accuracy in diagnosing benign and malignant tumours by using FNAC. In benign tumours, one case each of benign myoepithelioma and the benign lymphoepithelial lesion was interpreted as PA on FNAC. In malignant tumours, acinic cell carcinoma was interpreted as PA on FNAC. The exact overall cytohistological correlation was 92.5%, and that of benign and malignant tumours was 94% and 83% respectively.

Histopathological Types

Overall pleomorphic adenoma, constituted 65% of the tumours and among malignant tumours, mucoepidermoid carcinoma constituted 7.5% of the tumours in the series. Pleomorphic adenoma constituted 76.5% of the benign tumours and among the malignant tumours, mucoepidermoid carcinoma constituted 50% of them.

Follow Up

In this series, follow-up was done for 6 months. To know the recurrence of a tumour, long-term follow-up is necessary which was not possible in this study. During the study period, none of the operated patients came back with recurrent diseases.

Discussion

In this study, 40 cases of salivary gland tumours, that were admitted to the surgical units of M.K.C.G Medical College and Hospital, from JULY 2019 to JUNE 2021 were studied. A detailed analysis has been done and has been compared with statistics available from Indian authors and other authors of the world.

Age Distribution

Table 4: Comparison of Findings of This Study with Other Studies

Series	**Average age in years**			
	Benign		**Malignant**	
Budharaj et. al. [3] (1974)	41		41	
Khazanchi et. al. [4] 1988	44		50	
Renehan et. al. [5] 1996	55		59	
Everson [6] (1985)	55		65	
Present study	39		58	
Average Age Distribution of Salivary Gland Tumours in Various Studies				
Series	**Male**	**Female**	**Total**	**Ratio (M : F)**
Fenn A.S. 1982 [7]	31	26	57	1.2:1
Everson et al [6] (1985)	831	1579	2410	1:1.9
Renehan et. al. [5] 1996	652	542	1194	1.2:1
Present study	11	29	40	1:2.6
Sex Distribution of Salivary Gland Tumours in Various Studies				
Series	**No. of cases**	**Benign (%)**		**Malignant (%)**
Eversole [8] (1971)	2513	79		21
Spiro R. H. [9] (1986)	2807	54.5		45.5
Arathi Bhatia [10] (1993)	87	59.8		40.2
Renehan et. al. [5] 1996	1194	80%		20%
Present study	40	85		15
Frequency of Benign and Malignant Salivary Gland Tumours in Various Studies				

Analysis of the above data shows that, in most studies, the benign tumour occured at a younger age group than the malignant tumour. As per the above data, female preponderance was noted in Everson et al and GSMC studies which are comparable to the present study. Other studies showed male preponderance. [11-13]

Frequency of Benign and Malignant Salivary Gland Tumours

In this study, benign tumours were more common than malignant tumours, similar to other studies.

Clinical Feature: As per data shown, swelling is the commonest symptom. Pain, facial palsy, lymph node involvement, fixity and deep lobe involvement suggest malignancy. Potdar. et al have reported the incidence of pain and facial nerve paralysis in malignant neoplasms as 25-33% and 20-33% respectively. [14-17]

FNAC Comparison with Histopathological Diagnosis

The diagnostic accuracy of FNAC is comparable to Frable and Frable and Spiro R.H. studies for both benign and malignant tumours.

Types of Surgery

Superficial parotidectomy was the commonest surgery done.

Table 5:

Surgery	**Leverstein H. [18]**	**Present study**
Superficial parotidectomy	24.89%	77.5%
Partial superficial parotidectomy	53.86%	0%
Total parotidectomy	3.27%	10%
Comparison of Various Types of Surgery in Parotid Gland Tumours		
Complication	**Owen ERTC et. al.[19]**	**Present study**
Facial palsy Temporary Permanent	 38% 9%	 22.5% 5%
Salivary fistula	2%	5%
Wound infection	--	5%
Frey's syndrome	11%	0%
Frequency of Postoperative Complications in Various Studies		

Complication of Surgery

Temporary facial nerve complication was the commonest complication seen in both studies.

Histological Types of Tumour

Table 6: Frequency of Salivary Gland Tumours in Various Studies

Series	**Seth G.S (1993-98)**	**Jesus Souza et al [20] (1987-97)**	**Present study**
PA	64	34	26(65%)
BCA	6	-	1
WT	1	8	3
M	2	2	1
MEC	5	11	3(7.5%)
ACC	2	-	1
AdCC	2	-	-
Undifferentiated Ca	-	1	-
Malignant Unspecified	1	-	-
Benign Parotid Tumour	42	-	3
CA Ex PA	-	3	1
Metastatic deposits	-	-	1

In the present study, PA and MEC were the most common benign and malignant tumours respectively. These findings were similar to the previous studies. [21]

Permanent Facial Nerve Weakness

In this study, 5% (2 in no.) of the patients developed permanent facial weakness, which is comparable to most of the western literature (1 patient with mucoepidermoid carcinoma and 1 patient with acinar cell carcinoma). The reported incidence of permanent facial weakness was 0-17%, as per western literature. Mehle et al & Lacourrey et al have reported 46% and 65% incidence of immediate postoperative facial weakness. Permanent facial weakness was 4% in both series.

Conclusion

Diagnosis of the parotid gland tumours must be considered in any patient presenting with parotid gland swelling. Parotid gland tumours occur more commonly in the 3rd to 5th decade and are seen most commonly in females. Parotid gland tumours are more often benign, pleomorphic adenoma constitutes the majority of all neoplasms. Swelling is the commonest symptom. The fact that mass has been present for several years is no guarantee that it is benign. History and physical examination complementing FNAC help in diagnosis. FNAC has good accuracy in diagnosing parotid gland tumours. Surgery is the main modality of treatment in parotid gland tumours. The most commonly done surgery is superficial parotidectomy. Long-term follow-up is necessary as parotid gland tumours tend to recur after a long period. Since the most malignant tumour is asymptomatic and long-standing benign tumours can undergo malignant change, community awareness and early referral are necessary, as the prognosis is good if treated early.

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