SCIENTIFIC ARTICLE

A clinicopathological study of morphological pattern and management of parotid tumours: a multicentric experience

Arghya Basu[1], Arnab Mondal[2], Harish Kela[2], Soumika Biswas[3]
[1]B. R. Singh Hospital & Research Centre, Eastern Railways, Kolkata, West Bengal, India
[2]IPGMER & SSKM Hospital, Kolkata, West Bengal, India
[3]N.R.S Medical college & Hospital, Kolkata, West Bengal, India

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Abstract

Introduction

Parotid tumours are heterogeneous neoplasms with complex morphology and dubious clinical characters. The aim of our study was to assess the demographics, frequency, morphology, management & long term follow up results of the patients undergoing parotidectomy.

Methodology

This prospective study was conducted on all parotidectomies performed at the Dept. of Surgery and Surgical Oncology of three premiere teaching institutes of Kolkata between January 2011 to December 2015.

Result and discussion

The mean age of presentation in our study was comparable with other series [9,10]. Pleomorphic adenoma was most common with 51 (41.5%) patients and Warthin's tumour was 2nd most common with 19 (15.4%) patients. Permanent facial nerve palsy was seen in 0.04% of our patients. Pain (41.3%) and swelling (100%) were the most frequent presenting feature of malignancy. 15 (34%) patients with malignant tumour required additional reconstruction by pectoralis major myocutaneous flap.

Conclusion

Our study came out with many similarities in clinical course of parotid tumours in other parts of the world as well as a few individual findings. Surgery with optimum preoperative planning and counselling remains the mainstay of treatment.

Introduction

Salivary gland tumours are heterogeneous neoplasms with complex morphology and dubious clinical characters. They represent about 3% of all tumours and 5-6% of all head and neck tumours. 80% of these tumours are located in the parotid gland, of which, 80% are benign, limited in lower part of the gland and 80% of them are pleomorphic adenomas. Ninety percent of them arise from the superficial lobe[1]. These tumours represent a challenging clinical entity to the clinicians due to their wide spectrum of presentation, inconsistent clinical features, management protocols and unpredictable prognosis.

Parotid tumours are more frequent in females. Ionising radiation, exposure to sunlight, chemotherapy, smoking, Vitamin A deficiency, geographic location and ethnicity have been linked with their incidence. They appear as slow growing tumours with a visible swelling in the parotid region being the only feature in majority of the cases. Rapid enlargement, tenderness or neuropathy often signifies malignancy, tuberculosis or sarcoidosis [2]. Common malignant tumours are adenoid cystic carcinoma, mucoepidermoid carcinoma and adeno-carcinomas.

Fine Needle Aspiration Cytology (FNAC) is often the first pathological investigation with sensitivity and specificity of approximately 95% and 75% [3]. Although CT scan helps in delineating the extent of the lump, involvement of deep lobe, parapharyngeal extension and relation to facial nerve, MRI is considered as investigation of choice [4]. Relationship of the tumour with facial nerve warrants careful and cautious dissection during parotid surgery because unintentional injury or sacrifice of facial nerve leads to life-long disfigurement with discouraging result even after reanimation surgery .

The aim of our study was to assess the demographics, frequency, morphology, management and long term follow up results of the patients undergoing parotidectomy at three tertiary care centres of Kolkata between January 2011 to December 2015.

Materials and methods

A prospective study was performed on all parotidectomies performed at the Department of Surgical Oncology, B.R. Singh Hospital & Research Centre, Department of General

Correspondence: Arghya Basu
E-mail: dr.arghyarox@gmail.com
Received: 14-06-2017 Accepted: 11-11-2017
http://orcid.org/0000-0003-4074-6547
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Surgery, Medical College & Hospital, Kolkata and IPGMER & SSKM Hospital between January 2011 to December 2015. A total of 167 patients who underwent parotidectomy were identified. Data collected included patient particulars, detailed history, physical examination, USG/ CT / MRI scans, cytopathology and histopathological reports, ancillary investigations, type of surgery, postoperative events & follow up.

Inclusion criteria - all patients presenting with parotid tumours regardless of age and sex.

Exclusion criteria - inflammatory parotid swellings , parotid abscesses, post-traumatic parotid swellings, history of tuberculosis, sarcoidosis or prolonged alcoholism or steroid intake .

Results

Between January 2011 and December 2015, 167 patients underwent parotidectomy. Amongst them, 82 were male (49.1%) and 85 were female (50.9%). The mean age of presentation was 36 years for benign tumours with range between 22 – 76 years and 48 years for malignant tumours with range between 25 – 71 years. All the patients had FNAC performed prior to surgery. All the patients had CT / MRI scan performed before operation to assess the extent of the lesion.

Benign tumours were 123 (73.65%) and malignant tumours were 44 (26.35%) as per the final histopathology report . Among benign tumours pleomorphic adenoma was the most common (41.5%), of which 30 cases were found in females and 21 cases in males. Other benign tumours found in this series were recurrent pleomorphic adenoma (8.1%), monomorphic adenoma (8.9%), Warthin's tumour (15.4%), lipoma (2.4%), Schwannoma (7.3%), neurofibroma (5.7%), myoepithelioma (5.7%) and lymphoepithelial cysts (4.9%). All benign tumours presented with swelling in parotid region for months to years.

Most common malignant tumour in this series was mucoepidermoid carcinoma, 12 cases, 27.3% of malignant parotid tumours and 7.2 % of all parotid tumours. Other malignant tumours were adenoid cystic carcinoma (11.4%), acinic cell carcinoma (11.4%), carcinoma-ex-pleomorphic adenoma (11.4%), undifferentiated carcinoma (4.5%), salivary duct carcinoma (6.8%), poorly differentiated carcinoma (4.5%), basal cell adenocarcinoma (4.5%), myoepithelial carcinoma (2.3%), polymorphous low grade adenocarcinoma (4.5%), squamous cell carcinoma (2.3%), adenocarcinoma not otherwise specified (4.5%), sarcoma (2.3%) and lymphoma (2.3%). Pain (41.3%) and swelling (100%) were the most common symptoms in malignant parotid masses, followed by skin fixity (16.2%), underlying tissue fixity (9%), cervical lymphadenopathy (17.4%) and facial nerve palsy (3.6%).

Superficial lobe was the most frequent site involved by both benign and malignant tumours. Ninety eight (79.7%) benign tumours originated from the superficial lobe and 25(20.3%) tumours involved deep lobe, whereas all malignant tumours involved superficial lobe only.

Ninety eight (58.7%) out of 167 patients underwent superficial parotidectomy and 69 (41.3%) patients underwent total parotidectomy. Among 69 patients undergone total parotidectomy 25 were benign and 44 were malignant tumours. 25 patients with benign parotid tumours underwent total parotidectomy with facial nerve sparing as the tumour involved the deep lobe in addition to superficial lobe. 38 patients with malignant tumours had total parotidectomy with sparing of facial nerve macroscopically whereas 6 patients with malignant parotid tumours had total parotidectomy with facial nerve resection. Twenty nine patients underwent modified radical neck dissection with total parotidectomy because of palpable or radiologically significant neck nodes. Reconstruction by PMMC (Pectoralis Major Myocutaneous Flap) was required in 15 patients.

Eight patients developed post-operative hematoma which settled with aspiration or evacuation. Eleven patients developed wound infection following operation which resolved with intravenous broad-spectrum antibiotics and regular dressing. Hundred and thirty four (80.24%) patients had transient facial nerve palsy (House Brackman Grade 2 or 3) that resolved with steroids or spontaneously with time within 2-8 weeks. 6 (0.04%) patients with severe facial nerve had complete facial nerve palsy (House Brackman Grade 6) [5]. The mean follow up period after surgery was 9 months with range of 1-18 months.

In the follow up period we found that all the benign cases remained healthy without any mortality, among the malignant cases 22 patients (13.2%) with high grade malignancies died because of local or distant recurrence, 12 patients (7.2%) with intermediate grade malignancies are living with the disease, in the form of either local or distant recurrence, rest 10 patients (6%) are living without any recurrence or residual disease .

Table 1. Demographic, clinical, operative and post-operative data

No. of patients	**167**
Male/ Female	82/ 85
Left/ Right	96/71
Age in years	42 (range 22-76)
FNAC (Benign/ Malignant)	115/ 40 (12 – inconclusive)
Histology (Benign/ Malignant)	123/ 44
Parotidectomy (Superficial/ Total)	98/ 69
Mean follow up after surgery (months)	9 (range 1-18)

Table 2. Distribution of patients by age

Age in years	Benign tumours	Malignant tumours
21-30	2	2
31-40	43	8
41-50	40	11
51-60	22	15
61-70	13	7
71 and above	3	1
Total	123	44

Table 3. Distribution of patients by clinical features

Clinical feature	Number	Percentage (%)
Swelling	167	100
Pain	69	41.3
Skin involvement	27	16.2
Fixity with underlying muscle and/or bone	15	9
Enlargement of deep lobe	25	15
Facial nerve palsy	6	3.6
Palpable cervical lymphadenopathy	29	17.4

Table 4. Distribution of patients as per final histopathology report

MALIGNANT	44	26.3%
Mucoepidermoid Carcinoma	12	27.3%
Acinic cell carcinoma	5	11.4%
Adenoid cystic carcinoma	5	11.4%
Adenocarcinoma NOS	2	4.5%
Squamous cell carcinoma	1	2.3%
Lymphoma	1	2.3%
Sarcoma	1	2.3%
Carcinoma ex-pleomorphic adenoma	5	11.4%
Undifferentiated carcinoma	2	4.5%
Poorly differentiated carcinoma	2	4.5%
Salivary duct carcinoma	3	6.8%
Basal cell adenocarcinoma	2	4.5%
Myoepithelial carcinoma	1	2.3%
Polymorphous low grade adenocarcinoma	2	4.5%
BENIGN	**123**	**73.6%**
Pleomorphic adenoma	51	41.5%
Warthin'stumour	19	15.4%
Recurrent pleomorphic adenoma	10	8.1%
Monomorphic adenoma	11	8.9%
Lipoma	3	2.4%
Schwannoma	9	7.3%
Neurofibroma	7	5.7%
Myoepithelioma	7	5.7%
Lymphoepithelial cyst	6	4.9%

Table 5. Post-Parotidectomy Complications

COMPLICATION	Number	%
Haematoma	8	4.8
Wound infection	11	6.59
Facial nerve palsy (Transient)	114	68.26
Facial nerve palsy (Complete)	6	0.04
Recurrence	7	4.2
Flap Necrosis (PMMC)	2	1.2
Frey' syndrome	4	2.4
Salivation from wound	12	7.2
Ear numbness	43	25.75
General anaesthesia complications	5	3

Discussion

Salivary gland tumours are the most complex and morphologically diverse group of human tumours with different clinical features, varied morphology, dubious nature and unpredictable prognosis [6]. These tumours have infectious, granulomatous , auto-immune, obstructive, developmental, idiopathic and neoplastic etiology [7]. Most often they present as non-tender gradually progressive masses in respective regions. Most of them occur in the parotid gland and most of them are benign. Commonest form of benign salivary gland tumours is pleomorphic adenoma , both in major and minor salivary glands.

Incidence of parotid tumour is approximately 2.4/100,000/ year [8]. The mean age of presentation in our study was comparable with other series [9,10]. In contrast to literature, left sided tumours were more frequent and female preponderance was more in our study [11].

Benign tumours accounted for 73.6% of parotid tumour in this study. Pleomorphic adenoma was most common with 51 (41.5%) patients and Warthin's tumour was 2nd most common with 19 (15.4%) patients. Incidence of malignant tumours (26.3%) was compatible with other published data [12,13]. Mucoepidermoid carcinoma was the commonest malignant tumour of the parotid gland in the present study, 12 patients (27.3%) similar to literature.

All the patients had CT/MRI scan performed preoperatively to assess the extent of tumour and treatment planning. MRI was very useful particularly in patients with deep lobe involvement, suspected malignant tumours with local infiltration, recurrent cases and tumours extending to inaccessible areas such as retromandibular fossa or parapharyngeal space [14].

The incidence of transient facial nerve palsy was 68.26% in our study, higher than studies reported by Laccorreye [15] & Mehle [16]. Permanent facial nerve palsy was seen in 0.04% of our patients. Of the 6 cases who had complete nerve palsy, 3 had mucoepidermoid carcinoma, 2 had adenoid cystic carcinoma and 1 had poorly differentiated carcinoma with nerve entrapment. This result was similar to other studies (0-10%) [17].

Thorough anatomical knowledge and nerve stimulator are extremely necessary for facial nerve preservation. Patients with malignancy were preferentially treated with total parotidectomy with or without facial nerve sparing as compared to benign disease with a low threshold for nerve sacrifice.

Recurrence rate of pleomorphic adenoma in the present study was 8.1%, and rate of malignant transformation was 11.4% higher than many larger series (<2%) [18]. Surgery for these two entities was technically very challenging with increased morbidity and worse prognosis.

Pain (41.3%) and swelling (100%) were the most frequent presenting feature of malignancy in our study similar to the literature, however, skin or underlying tissue fixity and cervical lymphadenopathy have also been reported in other series as common features [19].

Surgery was the mainstay of treatment in our series. However,14 patients (31.8%) received neoadjuvant chemotherapy, 4 patients (9%) received adjuvant chemotherapy and 38 patients (86.36%) received adjuvant radiotherapy. 15 (34%) patients with malignant tumour required additional reconstruction by PMMC flap.

Conclusion

The current study is a prospective study of parotid tumours in three tertiary care hospitals of Kolkata over a span of 5 years. The approach was to study morphological and histopathological distribution of parotid tumours, classification, difficulties encountered during management and to compare with the observations in similar studies with special emphasis on incidence, age, sex and complication rates.

Our study found many similarities in clinical course of parotid tumours when compared to other parts of the world, as well as a few unique findings. Female preponderance was found with more tendency of left sided tumours. Average age of incidence was higher for malignant neoplasms than their benign counterparts . Pleomorphic adenoma was the most common benign parotid gland tumour and mucoepidermoid carcinoma was the most frequent malignant neoplasm . Surgery with optimum preoperative planning and counselling remains the mainstay of treatment . Prior and in-depth knowledge of regional anatomy with meticulous and careful planning and use of advance technology is essential to reduce the incidence of complications.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

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